



NMMU Research and Innovation Report 2012

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

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Message from the Vice-Chancellor



Prof Derrick Swartz
Vice-Chancellor

It gives me great pleasure to introduce the 2012 NMMU Research and Innovation Report, covering the most significant research and development activities and achievements of the University research community during this period. NMMU, as is clear from any cursory reading of this Report, places a high premium on the role of creative, critical and innovative knowledge in enabling social actors in society – particularly, its most vulnerable and marginalised sectors - to find adaptive and resilient strategies in coping with the increasingly complex, interdependent and unpredictable challenges facing our changing natural and social world in the second decade of this century.

Our vision is to become a leading African university providing cutting-edge knowledge for a sustainable future. NMMU research work is organised across seven (7) faculties, including a wide network of institutes, centres and units, and driven on the basis of thirteen (13) institutional research themes:

- Biodiversity Conservation and Restoration
- Coastal Marine and Shallow Water Ecosystems
- Cyber Citizenship
- Democratisation, Conflict and Poverty
- Earth Stewardship Science
- Health and Wellbeing
- Humanising Pedagogies
- Manufacturing Technology and Engineering
- Nanoscale Characterisation and Development of Strategic Materials
- Science, Mathematics and Technology Education for Society
- Strategic Energy Technologies
- Sustainable Human Settlements
- Sustainable Local Economic Development

Towards this end, we have escalated overall levels of strategic investments, from both internal and external funding sources, to build critical mass in each of these core research themes. Although capability across these fields is still not evenly spread, we are making significant strides. The focus of our investment strategy in 2012 has been on increasing the number of rated researchers, gearing research policy to support a vibrant research culture, system

of research production, and support for established, mid-career, emerging and next generation scholars. In addition, as the Report will clearly show, we have also invested in developing new as well as the revitalisation of existing research infrastructure, including laboratories, expensive 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, 2012 also saw the highly successful and expeditious appointment of no less than four (4) National Research Foundation funded Chairs in Microfluidic Bio/ Chemical Processing, Shallow Water Ecosystems, Earth Systems Science and Law of the Sea and Development in Africa. These high-level research platforms headed by distinguished and leading researchers from both South Africa and internationally, mark an important endowment towards NMMU's research theme-led strategy of development. We hope that our research leaders can effectively harness these platforms not only to build a corpus of distinctive scholarship, but also to cultivate a new generation of postgraduates and emerging scholars to develop these new and exciting research fields.

NMMU, perhaps of all universities in the Eastern Cape Province, enjoys the most wide-ranging links with industry and operate a range of innovative platforms connecting the University with the heart of industry. We encourage these links to grow not only in support of existing industries, but also to stimulate new horizon businesses. Some examples include the creation in 2012 of the Micro-algae-to-Biofuels platform, established with the generous financial assistance of the Technology Innovation Agency (TIA); Weldcore Technology platform in support of the power industry; NMMU High Resolution Electron Microscopy Centre project work in materials modelling for the minerals sector; work being done in precision tool engineering; and nanophotonics focusing on infrared sensors.

In civil society, NMMU's research innovation impact has also been felt in pioneering work done via the HIV/AIDS Research Chair in visual participatory research directly involving communities; in maths and science education, through the work of NMMU's FirstRand Chair in Mathematics Education with local schools; in improving quality of maths and science learner performance in schools; pioneering work done by the Centre for the Community School (CCS) in the reclamation and transformation of schools by communities via the Manyano Network; and work done in transforming the post-school education and training sector by NMMU's Centre for Post-School Education and Training (CIPSET).

These initiatives demonstrate not only NMMU's growing capacity to generate cutting-edge, original knowledge in advancing our understanding of complexity, uncertainty and inequality, but also our research community's capacity to creatively apply this knowledge with economic and social actors in facilitating transformation and development. This ability is crucial to

further develop if we are to successfully understand and tackle some of the epic challenges facing South Africa and indeed the wider continent in a world under stress from the contradictory pressures of globalisation, democracy, resource limitations and climate change – in particular, structural unemployment, distorted economic growth, social inequality and social exclusion and unsustainable development. We believe NMMU is both ideally placed and positioned to expand the impact its research and development is making in the wider world.

This strategy has been enabled, and itself further enabled positive growth in the number of NMMU National Research Foundation (NRF) rated researchers: from 64 in 2010, and 66 in 2011, to 72 in 2012. Natural science still contributes the bulk of rated researchers and aggregate research unit output, but other faculties are showing encouraging growth as the report shows. Total research output units have also shown quite encouraging upwards growth in recent years, from 656.48 in 2010 to 739.339 in 2011, and doctoral degrees from 59 in 2011 to 86 in 2012; and concomitant research output subsidy growth, from R59 million in 2010, R64 million in 2010 to R78 million in 2012. We have every reason to believe that this positive growth curve will be sustained in the next few years.

In terms of research internationalisation, the University drives this, in part, via a range of focused international partnerships with a core number of multi-dimensional university partners on all continents. The NMMU Internationalisation Committee is constantly reviewing the range, depth and quality of our partnerships, paying particular attention to new research opportunities in Brazil, India and China, apart from the wider African continent. The University has also benefitted from its membership of the successful Erasmus Mundus consortium, involving five (5) South African universities in partnership with a number of European Universities (Leuven, Freie Universitat Berlin, Pierre et Marie Curie, Karolinska Institute, Masaryk, Granada and Amsterdam), itself opening up unprecedented opportunities for research-intensive linkages with NMMU staff and students.

I would like to thank the University research community for their commitment and passion for developing forms of knowledge that can truly make a difference in their lives of communities blighted by poverty, unemployment, lack of economic opportunities and helping the re-imagining of the systems on which human and ecological development had been predicated for hundreds of years. We are hugely encouraged by their commitment towards the creation of a more equal, just and sustainable world. Finally, I would also like to extend my appreciation by the leadership shown by Professor Thoko Mayekiso, Deputy Vice-Chancellor: Research and Engagement, and her colleagues for making all this possible.

Prof Derrick Swartz
Vice-Chancellor

Message from the Deputy Vice-Chancellor: Research and Engagement



Prof Thoko Mayekiso
Deputy Vice-Chancellor:
Research and Engagement

In 2012, we continued with our strategies to build and enhance the NMMU's research profile as a comprehensive institution in line with Vision 2020. Our focus is on creating and sustaining an environment that encourages, supports and rewards a vibrant research, scholarship and innovation culture.

One of the milestones in 2012 was the completion of the identification of thirteen institutional research themes, which was initiated in 2011 based on our research strengths and unique characteristics. These broad research themes are intended to focus our research endeavours whilst simultaneously providing adequate scope for innovation and creativity. The foremost objective of the institutional research themes is to provide multi-/inter-/trans-disciplinary platforms for the establishment of centres of excellence.

Our focus is on creating and sustaining an environment that encourages, supports and rewards a vibrant research, scholarship and innovation culture.

The NMMU was awarded four DST/NRF Research Chairs as part of the South African Research Chairs Initiative (SARChI) in Law of the Sea and Development in Africa; Shallow Water Ecosystems, Earth Systems Science and Microfluidic Bio/Chemical Processing. These research chairs are indicative of NMMU's research capabilities in the four areas, which are aligned to our institutional research themes.

The University has a number of strategic research partnerships with renowned universities and science councils nationally and internationally and also participates in distinguished international associations that are increasingly contributing to our research strategy.

The NMMU was bestowed the honour of being the first recipient of the International Education Association of South Africa (IEASA)/Golden Key Award for Excellence in Internationalisation. The first of its kind, the IEASA/Golden Key Award for Excellence in Internationalisation recognises both the differences, as well as the stages of development,

of institutions. The desired outcome of this exercise is an attempt to provide South African higher education, as well as its broader audience, with a view on the advanced levels of the internationalisation of South African higher education institutions, as well as continuous recognition of the importance of internationalisation and as such the desire to be comprehensively internationalised. The strides we are making as NMMU are certainly felt far beyond our shores.

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Our research outputs have over the last few years shown a consistent growth with many of our researchers publishing in quality international and national journals. The number of publications co-authored with international scholars is on the increase as well as those co-authored with emerging researchers including postgraduate students. This is core to our strategic objectives of building the next generation of researchers and academics and to develop expertise in selected areas.

We have experienced a steady growth in the number of researchers with NRF rating from 66 in 2011 to 72 in 2012. The number of doctoral graduates increased from 59 in 2011 to 86 in 2012. Seven patent applications were filed in 2012. We are particularly pleased by the number of academic members of staff who completed their doctoral degrees in 2012. This places the percentage of staff with doctoral degrees at NMMU above the average of the higher education sector nationally. We have continued with our initiatives to enhance the postgraduate supervisory capacity of the academic staff across the institution.

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Researchers at NMMU are provided with a diverse range of incentives and awards as mechanisms to recognise and reward research excellence as part of the strategic goal of providing an enabling policy environment

to create a vibrant research culture. Research infrastructure and in particular cutting-edge research equipment is increasingly seen as the backbone of research excellence, especially in science, engineering and technology disciplines. An example is the acquisition of cutting-edge equipment is the Gatan Quantum Imaging Filter for the JEOL High Resolution Transmission Electron Microscope (TEM), which is the most advanced energy filter in the world. The filter enables fast capturing of electron energy loss spectroscopy data and performs three-dimensional electron tomography in energy filtered TEM mode. Other examples are a Scanning Probe Microscope of R5 million for the Department of Physics, and a Precision 3D Optical Profiler of R3.6 million for the Department of Mechanical Engineering.

The NMMU is well positioned to make a meaningful contribution to the research agenda of our country. Initiatives to deepen democracy, enhance social cohesion find expression in some of the research undertaken and provide ample evidence of the significant role NMMU plays on the national scene. We have embarked on the strategic positioning of our marine and maritime capabilities. Exciting research projects are undertaken in sustainability and renewable energy thereby demonstrating responsiveness to challenges of global warming.

The NMMU Optical Fibre Research Unit in collaboration with CISCO is involved in the area of broadband communication, more specific the Square Kilometre Array (SKA).

The research endeavours have been far-reaching, innovative, creative and entrepreneurial. Passion for what one researches, support from colleagues, and the conducive research environment provided by NMMU, have been identified by the researchers in this report as the key enablers for research and innovation. NMMU researchers are increasingly invited to provide expert opinion by policy makers based on their research.

Thanks are due to Council, Vice-Chancellor, Executive Deans, Chairpersons of Faculty of Research and Innovation Committees and the research community for their unwavering support of our research agenda.

*Siyabulela, nangamso
Baie dankie
Thank you*

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.

Internationalisation and Research



Dr Nico Jooste
Senior Director: Office for
International Education

Nelson Mandela Metropolitan University received the first award for *Good Practice in Comprehensive Internationalisation* awarded by the International Education Association of South Africa (IEASA) in 2012. The award highlighted the fact that the University successfully internationalised its research activities and contributed to the recognition that internationalisation is one of its defining characteristics.

International collaboration through international partnerships and the building of and participation in research networks defined a number of the research activities of the University. The internationally rated researchers in a variety of research fields contributed in the past year to the success and recognition of the University's research output. Institutional partnerships with international universities are one of the strategies to establish global reach and enhance innovation. The University continued to strengthen and develop greater variety in their international institutional partnerships. The new agreements entered into with Masaryk University in Brno, Czech Republic, as well as with Pontifical Catholic University of Rio de Janeiro, Brazil, are providing the University with new research collaboration opportunities. The comprehensive international nature of the University and its research endeavours are further illustrated by the number of individual international research collaborative projects that are initiated by the senior researchers of NMMU.

The international character of the University's research endeavours will be positively influenced by the Research Chairs (SARCHI) that will join the University in 2013. The international nature of the scholars and their research fields will allow the NMMU to participate globally in a variety of research fields.

At the heart of a successful research agenda lies postgraduate students. The growth in postgraduate student numbers from other parts of the world not only demonstrates the popularity and quality of Nelson Mandela Metropolitan University's research facilities but also enhances its research capacity. The growth in postgraduate students graduating from the University is clear evidence to this.

Nelson Mandela Metropolitan University is using the internationalisation of its research endeavours in a positive way to enhance its global reach as well as the global nature and relevance of its research output. It, however, focuses the nature of the research on the local and regional needs to contribute to the provision of solutions to the local environment with a clear global influence.

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 and to reward, through incentives, staff members who produce research outputs.

Several new international research collaborations were established via participation in bi-lateral agreements with Germany, Kenya, Sweden, Russia, and Switzerland.

One of the highlights of 2012 was the conclusion of the process to define thirteen institutional research themes. Subsequently a driver for each theme was identified and faculties started with the process of identifying sub-themes. This is an extremely important exercise for NMMU as the institutional themes, underpinned by research chairs and entities, is seen as one of the key elements to give effect to NMMU's research strategy. Other highlights included the revision of the policy governing research entities, which now makes provision for the structured review of entities every five years and the awarding of four DST/NRF SARCHI research chairs to NMMU. Internal research funding was substantially increased, inter alia to fund initiatives to support research theme development and to create opportunities for researchers from designated groups to read papers at international conferences.

Established researchers managed to further enhance their national and international standing through successful NRF rating and re-evaluation applications, new research collaborations and the publication of research findings in high impact publications. In this regard, eight staff members were rated for the first time and fourteen were successfully re-evaluated. Several new international research collaborations were established via participation in bi-lateral agreements with Germany, Kenya, Sweden, Russia, and Switzerland. National cooperation was boosted by the signing of a MoU with the Department of Environmental Affairs. This agreement is linked inter alia to the Department's new vessel, the Agulhas2, which serves as a platform for multi-disciplinary research. One of the spin-offs of this cooperation was the completion of two doctoral degrees. It is pleasing to note that the quality of journals in which research articles were published improved. This was demonstrated by the fact that 67% percent of articles were published in journals that appear on international indices.

Department of Research Capacity Development



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

The Department of Research Capacity Development is responsible for providing a range of support services to postgraduate students and emerging researchers. Two key drivers in the sustained growth of a university's research productivity are the facilitation of an enabling environment for postgraduate students and increasing the number of academic staff members who hold doctoral qualifications.

These aspects are central to supporting the strategic priorities articulated in NMMU's Vision 2020 and are supported by the University's continued prioritisation and committed contribution to scholarships and to the on-going capacity development of its academics and postgraduate students who constitute the next generation of researchers. The relevance of a support unit, such as Research Capacity Development, thus cannot be underestimated in supporting the academic project in as far as the development of postgraduate students is concerned. Parallel to student development, it is crucial that sustained interventions are foregrounded to support academic staff in their development as researchers.

Two key drivers in the sustained growth of a university's research productivity are the facilitation of an enabling environment for postgraduate students and increasing the number of academic staff members who hold doctoral qualifications.

During 2012, there has also been a focus on promoting the quality of dissertations and theses by supporting final-year doctoral students with regards to the costs of language and technical editing. Qualifying doctoral candidates were also allocated funding to present their research at conferences, which is an opportunity for critical peer review and for networking with other researchers in their respective fields. This funding source was made possible through circumventing a modest portion of the Research Output Subsidy.

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, which 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.

NMMU has continued to play a role locally, regionally and nationally: the Regional Innovation Forum has continued bringing research, industry and government together in the Nelson Mandela Bay and Cacadu District Municipalities.

In 2012, NMMU continued to drive the late stage research and development of a number of significant innovations based on NMMU-owned intellectual property. Many of these projects are now entering the commercialisation phase of development. While it is concerning that innovations take a long time to reach this stage and even longer to reach the market, it should be noted that this is not unusual: university-based innovations around the world take up to ten years, and sometimes longer, to reach the market. However, once successful, they can make a significant contribution to society both in terms of the advantages they bring (for example, an environmentally friendly manufacturing process) and in terms of local economic development and job creation. For NMMU, these are key reasons for the drive towards commercialisation: innovations should make a difference to society and not only remain as interesting research on a library shelf or in a journal.

NMMU has continued to play a role locally, regionally and nationally: the Regional Innovation Forum has continued bringing research, industry and government together in the Nelson Mandela Bay and Cacadu District Municipalities. NMMU staff further continues to play a major role in the Southern African Research and Innovation Management Association, the national association for research and innovation management leadership. NMMU supports innovation activities both in terms of the provision of expertise and financially. This has seen an increase in disclosures every year as well as an increase in projects managed and contracts facilitated by the Department. Awareness of the importance of intellectual property continues to grow and ensures that NMMU makes a contribution to the innovation space for the benefit of South Africa.

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.

Sustainable Local Economic Development

The main theme of the Faculty of Business and Economic Sciences is: sustainable local economic development. This theme has five sub-themes, namely: entrepreneurship, SMMEs and family businesses; local economic development; tourism; automobile industry and manufacturing; and ethics and social responsibility. Several research units such as the Unit for Applied Management Sciences, Ethics Unit and NMMU Family Business Unit resort under this theme.

Much of the research conducted in the School of Economics, Development and Tourism, its constituent departments, and the Unit for Economic Development and Tourism trans-disciplinary in nature and inform the research theme of LED. This is particularly so for the Department of Development Studies (DDS) with a range of collaborative academic work with Eastern Cape, national and international universities. The DDS research work in areas such as social and cultural capital, industrial policy, and valuing blue/maritime capital, outsourcing, and third sector research, incorporate a range of multi-disciplinary and trans-disciplinary inputs, and have a distinct local and regional application. Our visiting professors, research associates and their research contributions reinforce the disciplinary and inter-disciplinary study of local and regional economic development. Our Eastern Cape LED networks will further bolster research capacity enhancement for collaborative research work in the designated thematic fields. Through a collaborative approach the DDS vision is to establish a world-class facility for advanced and innovative work in development, and more specifically local economic development.

The BCom Honours Tourism programme is also a truly multi-disciplinary programme – ranging from Economics, Business Research, Marketing to Tourism. For example, in the Environmental Sciences and Science fields there are the thicket research and marine tourism research projects. These projects benefit from the expert services and input provided by Dr Serban Proches from the University of KwaZulu-Natal (UKZN) and Prof Richard Cowling (NMMU).

The BCom Honours Business Management programme integrates research in such fields as Economics, Business Management and Financial Management with Marketing, Tourism, Logistics and Transport, Human Resources Management, Labour Studies, and Industrial and Organisational Relations. Environmental Sciences have also been involved with regard to “greening” SMMEs and the need for starting “green” micro and small businesses. Other multi-disciplinary investigations involved gauging the perceptions of consumers on green micro and small businesses in Port Elizabeth and studies on the marketing of SMME’s by the Department of Marketing Management.

Other multi-disciplinary research includes projects in biodiversity, environmental management, green supply chain management, green building, construction and engineering, and eco-tourism.

Advanced Manufacturing and Engineering

It is evident that to increase South Africa’s prospects for improved competitiveness and economic growth there is a great need for innovation through engineering science and technology development. Engineering and advanced manufacturing underpins much of the South African economy and hold great potential for large scale job creation and social upliftment. The research within Advanced Manufacturing and Engineering is aligned with creating a sustainable engineering environment that encourages skills development and nurturing of a culture of engineering innovation. Through this research theme, South Africa’s manufacturing industry has access to world-class research facilities, supported by various entities allowing for the development of innovative solutions in the field of advanced manufacturing and engineering.

The Advanced Manufacturing and Engineering theme at the NMMU are supported by the following sub-themes: Automotive Engineering and Assembly Processes; Friction Processing as a surfacing, joining and repair technique; Production Optimisation with a strong focus on Lean Manufacturing; Renewable Energy Harvesting (wind and ocean) where off-grid applications and technologies are investigated; Supplier Development for the broader engineering and related manufacturing industry with the intent to support export readiness and job creation by unlocking local capabilities; and High Precision Fabrication for medical applications. Research and development efforts undertaken within the various sub-themes of Advanced Manufacturing and Engineering are aligned to contribute to the strategic goals of the Vision 2020 Strategic Plan of NMMU. The research environment and projects conducted within this theme has promoted collaboration and sharing of resources between multiple departments on an inter-faculty basis. The holistic approach between the various entities allows for the development of innovative solutions and stimulated an aptitude for commercialisation of Research and Development results.

Cyber Citizenship

Cyberspace has infiltrated our everyday lives to some or other extent. Most of us today have grown to be dependent on some service in cyberspace for communication (e.g. e-mail or Skype), entertainment (online games),

socialisation (Facebook or MXit), commerce (online banking or shopping), finding information (Google), etc. Few of us can imagine a life without most of these cyber related-services. Further, we must realise that this is only the beginning. Soon everything valuable and playing a role in your everyday life will be connected to cyberspace providing one or other service for convenience or modern-day survival. Whatever technology can come up with and is found to be of interest, of commercial use, to be enjoyed, etc. has been made available and introduced to society.

However, as the cyber citizen of tomorrow is continuously influenced by the cyber-connected way of living, it has become time that the philosophical, ethical, psychological, legal, educational, behavioral, etc. issues, related to mankind in general, needs to be researched and investigated before cyberspace changes mankind from what it ought to be. This is very well summarised in the words of Albert Einstein: “I fear the day when the technology overlaps with our humanity. The world will only have a generation of idiots.”

Current research efforts in this institutional research theme include: firstly, projects related to the legal and psychological aspects in cyberspace, for example activities associated with cyber-bullying; secondly, educational and behavioral projects striving towards a cyber-secure culture amongst the general society; thirdly, the more technological solutions towards safer online banking and ecommerce. It is envisaged that the ethical, philosophical and managerial aspects influencing the effective and efficient deployment of cyber-related activities and services for the general benefit of mankind will also be undertaken.

Health and Wellbeing

The broad theme covers a spectrum of relevant areas where either critical mass already exists at NMMU, or areas that warrant being included based on their strategic importance. Nine sub-themes were identified, namely 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. These nine sub-themes are not mutually exclusive, and overlap takes place since most of the sub-themes are of a multi- and/or interdisciplinary nature. Towards the end of 2012, the theme has been renamed to “Health and Wellbeing” and further refinement of the sub-themes has since taken place. The theme, housed in the Faculty of Health Sciences, is spanning four faculties and has since its inception stimulated constructive research debate and encouraged collaboration between departments and faculties, and has led to a number of new collaborative projects. Further development of the main theme is planned for 2013, including workshops/seminars as well as the identification of areas for greater collaborative effort both within the University and with significant stakeholders outside the University. The theme is of strategic importance to South Africa, as is evidenced by its mentioning in various policies and other documents. With National Health Insurance (NHI) in the process of being introduced in South Africa, all aspects related to health research are of significance.

Nanoscale Characterisation and Development of Strategic Materials

During the past two years, the Centre for High Resolution Transmission Electron Microscopy (HRTEM) has established itself as a leading global facility in materials characterisation on the nano- and atomic scale. The Centre houses an atomic resolution transmission electron microscope, three other supporting state-of-the-art electron microscopes, as well as the complete enabling infrastructure for sample preparation and data processing. With a resolution of 0.08 nm, the JEOL atomic resolution electron microscope can image and chemically analyse materials down to the atomic scale - a feat previously unattainable in South Africa.

The significance of the nano- and atomic scale electron microscopy research covers a wide range of key technologies – from identifying single iron atoms in graphene to obtaining information that could improve the safety of future nuclear reactors and extend the life of diamond drill bit inserts in oil drills. With the high resolution electron microscope it was possible to solve problems that have been mysteries to international researchers for many decades, e.g. the release mechanism of radio active silver in pebble bed type reactors, the phase of a specific platinum-silver alloy and the thermal degradation mechanism of diamond drill bit inserts.

Atomic resolution imaging has also provided important new information on nanoparticle catalysts, platelets in natural diamond, steel exposed to high temperature and stress conditions in coal fired power plants and radiation damage in oxide dispersion strengthened steel and silicon carbide. The Centre has already generated an impressive number of publications in a wide range of journals such as *Nature Communications*, *Nano Letters*, *Journal of Nuclear Materials*, *Minerals Engineering* and *Nuclear Engineering and Design*. It actively collaborates with institutions in the UK, USA, Russia, Germany, China, and Sweden.

Democratisation, Conflict and Poverty

Emerging democracies with a history of deep-rooted conflict such as South Africa struggle with violent conflict and the attainment of social cohesion, justice and equality. Sustainable peace in South Africa encompasses the cessation of structural violence by replacing large-scale poverty with relative prosperity, inequalities with social justice, and political alienation with democratic participation. These key elements of sustainable peace and a cohesive society are premised on the willingness of groups and individuals to engage with conflict constructively through conflict resolution mechanisms and democratic processes. Research around these complex issues are encapsulated in the theme Democratisation, Conflict and Poverty, which involves scholars from various disciplines and sub-disciplines across faculties at NMMU.

There are several research hubs and related activities in the Faculty of Arts, which form a critical mass around the theme Democratisation, Conflict and Poverty. This is reflected in the following sub-themes adopted by the

four schools in the Faculty: School of Governmental and Social Sciences: "Social Identity, Ecosystemic Integrity and Transformation"; School of Language, Media and Culture: "Language, Literature, Communication, Media, Culture and the question of Social Cohesion"; School of Architecture: "Diverse aspects of Architecture in the African City in a Changing World"; School of Music, Art and Design: "Cultural Practices in a Changing Society". It is evident from the formulation of these sub-themes that the Schools regard change or social transformation as being a salient feature of South African society and their research highlights the state of "social cohesion" that accompanies such change, and actively contributes to, or articulates the conditions for, achieving a greater degree of democratisation, social justice and equality.

Lecturers and students in the School of Music, Art and Design have been actively involved in projects for the artistic transformation and renewal of urban spaces in Central, Port Elizabeth. The School of Architecture have used their expertise to pursue and coordinate research into urban-architectural conditions for the kind of "social cohesion" that arises out of a spontaneous structuring of space, rather than the imposition, through bureaucratic planning of rigid spaces of social exclusion. In the School of Governmental and Social Sciences there is a concentration of expertise in "conflict resolution" and "deep-rooted conflict" in Africa and this focus is intimately linked to diverse aspects of democratisation, post-conflict reconstruction, gender violence and crime prevention. In addition, there are several staff members in the School and in the Raymond Mhlaba Institute whose research focuses on questions of national identity, political and electoral conflict, service delivery and public participation processes. The School of Language, Media and Culture includes research activities that reflect relevance for questions of "social cohesion", concerning, (second-) language acquisition and mutual understanding in various branches of linguistics, while others, specialise in research on social media, networking and advertising.

Sustainable Human Settlements

The current need for further research into sustainable human settlement development and management processes and systems, as well as the transformation towards sustainability and environmental friendly cities, is glaring in the built environment nationally and internationally. This pushes the boundaries of existing theories, professions and practices in the built, social, economic, institutional, and natural environments beyond their current capacities; hence this research theme responds to the bigger questions that have not been fully explored and answered.

The big question for the institutional theme is:

"How can the living environments of human beings be improved in an integrated and sustainable development paradigm?" This question should address all the dimensions of integrated sustainable development, such as the spatial, social, economic, political, institutional, ecological, technological, and managerial dimensions.

The theme covers the following sub-themes and corresponding big questions.

The sub-themes are led by the co-ordinators as mentioned forthwith:

- Architecture and Urbanism, addressing the question: “How can South Africa’s cities absorb a floodtide of new urban inhabitants and maintain and promote urban liveability?” Co-ordinator: Prof Gavin MacLachlan.
- Construction of Infrastructure and Buildings, addressing the question: “How can the construction phase of delivering infrastructure and buildings be improved to ensure efficiency and sustainability?” Co-ordinator: Prof Winston Shakantu.
- Governance and Management of Human Settlements, addressing the question: “How can the governance and management of integrated, sustainable human settlement development and maintenance be improved through suitable policies, processes and systems?” Co-ordinator: Prof Kobus van Wyk.
- Socio-economic Development for Sustainable Livelihoods, addressing the question: “What new models of local socio-economic development should be explored for a sustainable future?” Co-ordinator: Dr Janet Cherry.

The multi- and trans-disciplinary nature of the research in this field of study provides opportunities to a number of departments to contribute to the creation of new knowledge. The newly developed professional degree in human settlement development, which the NMMU will start offering in 2014, provides opportunities for the transfer of existing and new knowledge to human settlement management practitioners and professionals. Various degrees in other disciplines, such as Architecture, Building, Construction Management, Development Studies, Geography, Public Management, Quantity Surveying, and Sociology also serve as conduits for knowledge transfer. This theme serves as an ideal example of multi and trans-disciplinary research focussing on real-world development challenges.

Humanising Pedagogies

NMMU’s “distinctive knowledge paradigm” is explicitly linked to a humanising pedagogy. In Vision 2020 it states that: “[w]e adopt a humanising pedagogical approach that respects and acknowledges diverse knowledge traditions and engages them in critical dialogue in order to nurture a participative approach to problem-posing and -solving, and the ability to contribute to a multi-cultural society”. Thus, the principle of humanising pedagogies emerges as one of the signature concepts in relation to the strategic direction of the University. Vision 2020 goes on to specify that “[b]y 2020, the teaching and learning environment at NMMU is characterised by students and staff being challenged to strive for excellence and success through an emphasis on a humanising pedagogy...”. Furthermore, it commits to “develop[ing] an understanding of a humanising pedagogy and strategies to give effect to this approach” (Strategic Objective 2.1) so that we can give relevant social meaning to our academic endeavours in the Arts, Business and Economic Sciences, Education, Engineering, the Built Environment and Information Technology, Health Sciences, Law, and the Sciences.

The central research questions guiding the work in this institutional research theme relate to how we conceptualise and describe Humanising Pedagogies, and what it means (and requires of us) in terms of strategic, tactical and exploratory interventions and dispositions to give expression to the principles

of Humanising Pedagogies. In relation to the central questions, we will investigate and explore what is embedded in our current practices in a range of domains, and how Humanising Pedagogies could contribute to curriculum renewal and the regeneration of intellectual cultures (including research, professional and institutional cultures) across all layers in the institution.

Coastal, Marine and Shallow Water Ecosystems

The coastal and marine environments are under considerable pressure due to human developments and demand for resources in these areas. Research into the coastal, marine and shallow water ecosystems at NMMU focuses on estuarine, sandy beach, and island ecosystems as well as the southern Agulhas region of the western Indian Ocean.

The organisms that are studied range from the very small (bacteria and microalgae) through to the very large (whales). Charismatic organisms of particular interest are turtles, marine mammals, and species that are harvested or cultivated, such as abalone and oysters. The NMMU Research Diving group provides training of research divers and boat skippers and has a pool of research divers to support marine and coastal research. Aspects on maritime history, law and engineering are also addressed.

Science, Mathematics and Technology Education for Society

To date, research under this theme has included issues of teaching, learning and language in Pharmacology classes, developing spatial cognition, spatial perspective and problem-solving in Geography when using GIS, using blended learning to develop IT logic, and the development of an electronic platform for laboratory reports in engineering.

Research into issues of teaching, learning and language in Pharmacology revealed that an intervention, which engaged the didactical practice of exploratory talk in Supplementary Instruction sessions produced statistically and practically significant improvement in examination scores for the experimental group of Pharmacy students over that of the comparison group. This study resulted in a PhD being awarded in April 2013.

The investigation into the effect of using GIS on the development of spatial cognition, spatial perspective and problem-solving in Geography revealed that the use of GIS does promote statistically and practically significant improvements in learners’ spatial cognition and spatial perspective taking, but had no effect on their problem-solving abilities. This work has resulted in a PhD study being submitted for examination in November 2013.

The initiative to develop an electronic platform heuristic for developing engineering students report writing skills began in the second semester of this year and has included partners from the Mechanical Engineering, IT and Education sectors at NMMU.

NRF Rated Researchers

Total number of NRF Rated Researchers at NMMU (2010 – 2012)

2010	64
2011	66
2012	72

Number of Rated Researchers per Rating Category (2010 – 2012)

RATING CATEGORY	2010	2011	2012
A1	1	2	2
A2	0	0	0
B1	0	0	1
B2	2	2	2
B3	4	5	4
C1	9	11	12
C2	15	18	23
C3	20	19	21
Y1	0	0	0
Y2	7	4	4
L	6	5	3
Total	64	66	72

Number of Rated Researchers per Faculty/Division (2012)

FACULTY	A	B	C	P	Y	L	Total
Arts			5				5
Business and Economic Sciences			3		1	1	5
Education			3			1	4
Engineering, the Built Environment and Information Technology (EBEIT)		2	9		1		12
Health Sciences		1	2				3
Law			1		1		2
Science	2	4	29		1	1	37
Support Services			4				4
Total	2	7	56		4	3	72

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 Science	Psychology
Branch, B, Dr	B2	Science	Zoology
Christopher, AJ, Prof	B2	Science	Geography
Baird, D, Prof	B3	Science	Zoology
Kotze, P, Prof	B3	EBEIT	Information Technology
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, Dr	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
De Lange, N, Prof	C2	Education	HIV/AIDS Education
Engelbrecht, JAA, Prof	C2	Science	Physics
Fabricius, C, Prof	C2	Science	Ecology
Foxcroft, CD, Prof	C2	HEADS	Psychology
Hurst, A, Prof	C2	Arts	Philosophy
Janse van Vuuren, HE, Prof	C2	Arts	Literature
John, PH, Dr	C2	Arts	Literature

Rated Researchers			
NAME	RATING	FACULTY/ DIVISION	DISCIPLINE
Kakembo, V, Prof	C2	Science	Geosciences
Kotze, EF, Prof	C2	Arts	Literature
Leitch, AWR, Prof	C2	Science	Physics
Lombard, AT, Dr	C2	Science	Botany
Measey, J, Dr	C2	Science	Zoology
Neethling, JH, Prof	C2	Science	Physics
Pistorius, PA, Dr	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, Dr	C2	Science	Biochemistry
Van Dyk, EE, Prof	C2	Science	Physics
Van Greunen, D, Prof	C2	EBEIT	Information Technology
Webb, P, Prof	C2	Education	Mathematics Education
Abou-El-Hossein, K Dr	C3	EBEIT	Mechatronics
Botha, RA, Prof	C3	EBEIT	Information Technology
Calitz, A, Prof	C3	Science	Computer Science
Farrington, SM, Dr	C3	Business and Economic Science	Business Management
Ferg, EE, Dr	C3	Science	Chemistry
Frost, CL, Prof	C3	Science	Biochemistry
Herselman, M, Prof	C3	EBEIT	Information Technology
Mayekiso, TV, Prof	C3	DVC: Research and Engagement	Psychology
McClelland, CW, Prof	C3	Science	Chemistry
McGrath, P, Prof	C3	EBEIT	Mechanical Engineering
Milne, PJ, Prof	C3	Health Sciences	Pharmacy
Naude, P, Prof	C3	DVC: Academic	Theology
Ocran, M, Dr	C3	Business and Economic Sciences	Economics

Rated Researchers			
NAME	RATING	FACULTY/ DIVISION	DISCIPLINE
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
Whittington, PA, Dr	C3	Science	Zoology
Zeelie, B, Prof	C3	Science	Chemistry
Smith, EE, Prof	L	Business and Economic Sciences	Business Management
Somai, BM, Dr	L	Science	Microbiology
Wood, LA, Prof	L	Education	Educational Psychology
Knoetze, E, Prof	Y2	Law	Private Law
Mzilikazi, N, Dr	Y2	Science	Zoology
Thomson, K-L, Dr	Y2	EBEIT	Information Technology
Venter, E, Prof	Y2	Business and Economic Sciences	Business Management

2012 New NRF Rating Application Outcomes

The following staff members were newly rated in 2012:

Dr Rajesh Anandjiwala: C1



Dr Rajesh Anandjiwala's research focuses on textile science and biocomposites. His recent activities on natural fibre composites and biocomposites have provided for a new research direction. As a result, the Department of Science and Technology has established a Biocomposites Centre of Competence with major activities in his research group at the Council for Scientific and Industrial Research (CSIR) Port Elizabeth. His research group is engaged in national and international projects in development of newer applications in automotive, aerospace, built environment and packaging. Prof Anandjiwala is also involved in international natural fibre consortiums, such as the European Network and the Commonwealths' Africa Forum. He is a Fellow of the Textile Institute and leads a group of about 22 researchers and nine postgraduate students based at the CSIR Port Elizabeth campus.

Dr Phillip John: C2

Dr Phillip John's research focus is on the exploration of the role and function that aesthetic expression plays in literary works, specifically Afrikaans prose. This focus enabled him to initiate an academic debate that has continued for the last eight years, and which has further involved a number of Afrikaans literary scholars. This debate can be productive and enriching, especially once it is explored in students' research, which has happened in at least two doctoral studies. His research is mainly interpretative, focussed on Afrikaans literature, but always with an eye on addressing fundamental questions pertaining to theory and implications for the discipline itself.

Dr John Measey: C2

Dr John Measey's research centres on ecological investigations incorporating

a wide range of techniques to address hypotheses in evolution, conservation and population biology. Dr Measey conducted extensive fieldwork in eastern and southern Africa (as well as South America and India) covering diverse herpetological taxa including caecilians, anurans, amphisbaenians, lacertids, and chameleons. In addition to publishing numerous peer reviewed papers, books and book chapters, Dr Measey is editor-in-chief of the *African Journal of Herpetology*, an associate editor for *Salamandra* and an academic editor for the new journal *PeerJ*. He is a research associate of the DST-NRF Centre of Excellence for Invasion Biology and is the International Union for Conservation of Nature Species Survival Commission (IUCN/SSC) Amphibian Specialist Group Regional Chair for Southern Africa. He is currently establishing a new population genetics lab in the Department of Zoology as well as launching a new research base in the Eastern Cape.

Prof Andre Calitz: C3



Over the past couple of years Prof Andre Calitz and his research team established Enterprise Resource Planning (ERP), sustainability and environmental information systems research in South Africa in collaboration with Oldenburg University, Germany. The leading research conducted in South Africa has attracted international attention, specifically in the field of Sustainability Reporting by Higher Education Institutions. The collaborative research with industry and specifically Syspro ERP has assisted in increased research outputs. Prof Calitz will continue to focus his research on a multi-disciplinary Computer Science and Information Systems environment and maintain his four established research areas. The research conducted using mobile technologies will be extended and integrated with the ICT careers portal on the Department of Computing Sciences website. The research on user experience (UX) and eye-tracking will be maintained and include research into the use of new technologies available in the Department, such as multi-touch surfaces and tablet PC's (Apple iPad). New and on-going research relating to his DBA has been established with Makerere University in Uganda and the University of Tanzania: Department of Computer Science.

Prof Shelley Farrington: C3

Prof Shelley Farrington's research focuses on investigating issues of concern to family businesses, more specifically transgenerational entrepreneurship and the factors influencing this among family businesses. By investigating

transgenerational entrepreneurship the research aims to understand how successful long-lived family firms ignite entrepreneurial thought and action across generations.



The NMMU Family Business Unit, with Prof Farrington as research coordinator, has recently applied to collaborate 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 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.

Prof Thoko Mayekiso: C3



Prof Thoko Mayekiso's research focuses on HIV and AIDS among the youth and people at risk of HIV infection. The research track is mainly that of preventive approaches and how individuals and communities strive to prevent HIV and AIDS. The research looks at theoretical and methodological issues associated with HIV and AIDS prevention. There are philosophical, traditional and religious underpinnings to the research focus. Recent approaches such as New HIV Prevention Technologies are also included in the study approaches. The research paradigm is dynamic in the sense that it focuses on new world approaches to the understanding of HIV and AIDS, thus the study focuses on current research trends and interventions. The global focus enables Prof Mayekiso and her research team to stay abreast of the changes in the nature of the epidemic and attendant challenges in both social and medical research.

Prof Matthew Ocran: C3



Prof Matthew Ocran's research interest is in the main areas of finance, monetary policy, economic development and applied econometrics. His publications in South African and international academic journals include papers on monetary policy, microstructure of financial markets, commodity markets and their interactions with monetary policy and the role of commodity markets in economic growth. The other themes that Prof Ocran's past research focused on are: trade liberalisation and growth as well as asset price forecasting. Prof Ocran has also published with a number of his Masters and Doctoral students in his area of research interest as part of their postgraduate training. Currently, he is working on a number of studies to examine how fixed-income securities can be used as a source of development finance in Africa.

Prof Andre Venter: C3



Prof Andre Venter's research is primarily focussed on the characterisation and identification of electrically active point and extended defects in binary semiconductors, such as gallium antimonide (GaSb) and zinc oxide (ZnO), amongst others. These materials have been identified as part of a broader national initiative for the development of detectors and light emitting devices operating in the infrared (IR) and ultraviolet (UV) region of the electromagnetic spectrum. His research forms part of the research activities of the SARChI Chair in Nanophotonics in the Physics Department at NMMU.

DHET Research Output Units

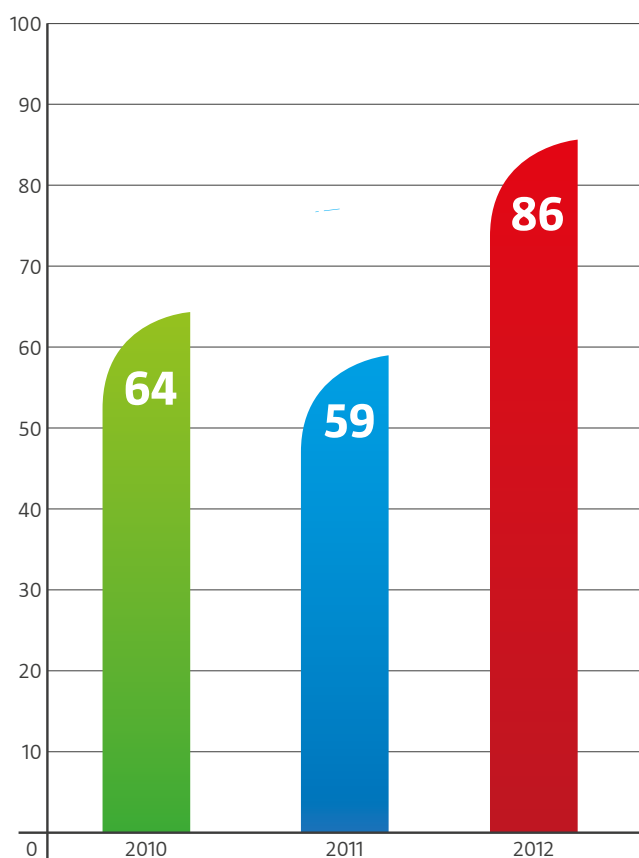
The research output units allocated by the DHET for research publications and graduating Masters and Doctoral students represents a crucial benchmark of research excellence and is based on successful Doctoral and Masters graduates and subsidies generated through academic publications.

Distribution of Doctoral Graduates by Faculty (2010 - 2012)			
FACULTY	2010	2011	2012
Arts	6	8	6
Business and Economic Sciences	12	12	25
EBEIT	10	6	10
Education	9	6	8
Health Sciences	5	3	4
Law	1	-	4
Science	21	17	29
Total	64	59	86

DHET Research Output Subsidy Units (2010– 2012)						
Year	Journal Articles	Books/ Book Chapters	Conference Proceedings	Publications Total	Research M & D Units	Total
2010	200.92	8.98	45.61	255.51	400.966	656.48
2011	283.26	7.95	59.98	351.44	387.899	739.339
2012	268.52	*	*	*	393	

* not yet available

Number of Doctoral Graduates (2010 - 2012)



Research Masters Output Numbers per Faculty (2012)	
FACULTY	MASTERS
Arts	18
Business and Economic Sciences	22
Education	9
Engineering, the Built Environment and Information Technology	25
Health Sciences	11
Law	3
Science	43
George Campus	4
Total	135

Top 20 Researchers based on Journal Articles

TITLE	INITIALS	SURNAME	UNITS
Dr	EC	Hosten	11.485
Prof	JR	Botha	10.606
Prof	TIA	Gerber	10.515
Prof	G	Olivier	7
Prof	JB	Adams	4.924
Prof	SM	Farrington	4.594
Prof	V	Kakembo	4.18
Prof	JH	Neethling	3.616
Dr	E	Figueiredo	3.58
Prof	M	Van de Venter	3.43
Prof	N	De Lange	3.41
Prof	A	Venter	3.408
Prof	LH	Watson	3.11
Prof	R	Von Solms	3
Prof	MC	Wagener	2.865
Prof	PJ	Badenhorst	2.83
Prof	EE	Ferg	2.67
Prof	AM	Hurst	2.5
Dr	WJ	Isaacs-Martin	2.5
Prof	P	Webb	2.5



Prof Janine Adams



Dr Wendy Isaacs-Martin

Innovation Overview



NMMU continues to drive innovation and technology transfer by creating awareness of Intellectual Property (IP) issues and through the protection, management and commercialisation of NMMU's Intellectual Property. The following is a brief account of the progress made in 2012 across the spectrum of innovation activities. Innovation projects at various stages of development and from various disciplines are also highlighted.

Intellectual Property Awareness

Seminars, workshops and information booklets on Intellectual Property were arranged by the Department of Innovation Support and Technology Transfer in 2012. 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 were presented by patent attorneys and industry specialists. Highlights included a one-day seminar on IP in March 2012 by Rory Moore of Moore IP as well as a visit by Rowan Joseph of Von Seidels Attorneys in August 2012 who discussed patents and designs.

Intellectual Property Identification and Protection

During 2012, 27 disclosures were received from staff and students (from 14 in 2011) and three provisional patent applications were filed. This increase of 93% can be attributed to new staff members joining the Department of Innovation Support and Technology Transfer and working closely with researchers as well as a number of late stage research projects that have created new Intellectual Property. Of the disclosures, 15 became new projects or were additions to existing projects and three are pending further information, meaning that 67% of the disclosures were potentially commercialisable. One "international" (Patent Cooperation Treaty) patent application was filed in 2012 based on three South African provisional patent applications from 2011. The novelty search report received during the Patent Cooperation Treaty phase of the patenting process was positive, indicating that the patent specification was both novel and inventive.

Intellectual Property Management

Twenty-one projects in the pre-commercialisation phase were managed in 2012. 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 flat proof grading of timber planks and a career exploration programme (pending research), a new turbine blade configuration and anthelmintics from plants (proof of concept), mobile pill reminder application and securing online banking transactions (prototype), and renewable energy streetlight and photovoltaic testing services (market-ready). Two projects, the algae-to-energy project and the friction welding applications project have attracted significant late stage research and development funding from the Technology Innovation Agency and other sources to proceed to commercialisation.

Intellectual Property Commercialisation

During 2012, NMMU took a decision to separate the identification, protection and management of Intellectual Property from 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.

Eights projects were considered to be in the commercialisation stage in 2012, including two design projects being incubated in the Arts and Design Incubator. Four projects have been fully commercialised and NMMU continues to be significantly involved in these projects. Two of the projects, preservation of roses and zinc oxide replacement, have included the creation of spin-off companies and NMMU plays a role in these companies on the Board as well as assisting with advice on patent strategies.

The third project involves the licensing of two software programmes developed by the Student Counselling Centre of NMMU to other institutions in South Africa. The first piece of software is a database programme used to track the results of interventions with students and the second is an online questionnaire to assist students with lifestyle evaluation. The fourth project is a license for the Touch Tutor™ Maths and Science DVD series embedded onto tablets.

NMMU Innovation and Technology Transfer Awards

NMMU's Innovation and Technology Transfer Awards recognise those individuals and teams that go beyond research and transfer research

outcomes for societal benefit. This is usually through the creation of new and improved products, services and processes and may be through commercialisation or through social projects. Society benefits from innovation and technology transfer through economic development, access to better products and services, or through new and innovative social projects.

The 2012 award was won by Prof Farouk Smith for his patented work on minimising the space and weight requirements of electronic circuits. In 2012, two provisional patent applications and one PCT (Patent Cooperation Treaty) application were filed in this technology area with Prof Smith as sole inventor. The technology relates to reducing the requirement for triple redundancy to ensure accuracy in circuits that may be affected by space radiation. Actual radiation testing will be undertaken before commercialisation of the research.

Contribution to Regional Innovation

NMMU along with 14 other local organisations, champions the Regional Innovation Forum. Launched in 2011, the Forum has gone from strength to strength during 2012. 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.



An event on the application of natural fibres was hosted by the Regional Innovation Forum. Speakers were Francois Denner (second from left) and Tony Budden (second from right). Joining them (from left to right) were Jaci Barnett, Chair of the Regional Innovation Forum; Belinda Vabaza, Eastern Cape Development Corporation; and Wendy Fisher, Strategic Edge Consulting.

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 2012 included a seminar on the future of natural fibre, a number of lectures on renewable energy and how local industry can respond to this new trend, and a networking event on opportunities in the hydrogen fuel industry.

Innovation Projects

Friction processing applications

eNtsa, NMMU's Technology Station in the School of Engineering, secured funding from Technology Innovation Agency (TIA) for the late stage development and commercialisation of their Weldcore® technology. This unique engineering technology offers an efficient, cost-effective way to quantitatively test whether to replace engineering structures. The TIA funding will be used to develop new industrial applications for the technology, to test platforms for specific applications and to commercialise the applications.

During their lifetime, materials subjected to high temperatures and pressures suffer stress and degradation, for example, steam pipes in power stations. Assessing the level of material degradation is critical to decide whether it is safe to continue running the plant or whether the material (for example, the pipe) must be replaced. The Weldcore® technology is a method of removing representative samples from a potentially degraded material and repairing the sample site using a novel welding technology. Shutdown costs are minimised, and the sample taken can be analysed to determine whether to replace the structure or whether it can safely continue running.

Recent successes include work performed at Hendrina Power Station in Mpumalanga saving Eskom billions of rands in capital replacement costs. In October 2012, Eskom also awarded the eNtsa team the Eskom Chairman's Award in the Innovation Category in recognition of their work on this project.



Prof Danie Hattingh (fourth from the right), Mr Mark Newby of Eskom (second from the right) and members of the eNtsa team with the Eskom Chairman's Award

Algae-to-Energy

The Micro-Algae-to-Energy (MA2E) project being run by InnoVenton, NMMU's Institute for Chemical Technology, is focused on developing algae-based technologies for environmentally sustainable energy use and energy recycling. There are three main focus areas: production of algae using photobioreactors; using algae to bind waste and fine coal to produce higher value coal agglomerates, Coalgae™; and producing biocrude oil from algae liquefaction.

The project has received funding from the Technology Innovation Agency as well as from Eskom. The technology for binding of coal fines using algae is almost at the commercialisation stage, with an engineering study being undertaken for a 1 ha demonstration plant. This will enable the project to secure commercial funding to take it to the next level. The plant will be the first of its kind in the world and will change the way that algae adds value to climate change initiatives.



Coalgae™ briquettes produced by InnoVenton

Street Light Powered by Renewable Energy

An off-grid urban lighting system powered by a combination of a vertical axis wind turbine (VAWT) and photovoltaic (PV) cells has been developed by NMMU. The system, trade marked as Twerly™, will produce less noise pollution than conventional wind turbines, which will allow them to be installed in residential areas. In addition, VAWTs are simpler to construct and cheaper to manufacture than normal horizontal axis turbines. The dual energy supply 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.



Tweryl™ street light

Improving Maths and Science

NMMU's Govan Mbeki Mathematics Development Unit has created a DVD Series covering the entire South African Maths syllabus for Grade 10, 11 and 12, as well as Science for Grade 11 and 12. The Series, called Touch Tutor®, is being used in incubator schools to improve Maths and Science, as well as for training student teachers. Touch Tutor® has been licensed to Innovolve Pty Ltd, NMMU's commercialisation company, which has sub-licensed it to Future Mobile Technology (FMT). FMT has embedded the Series on locally-produced tablet computers, which are available at selected retailers nationwide.



The Netsurfer™ SCHOLAR with embedded Touch Tutor®

Incubator Delivers Fashion Success Stories

Set up by the Department of Innovation Support and Technology Transfer and the Department of Applied Design to assist NMMU creative arts graduates kick-start their businesses, the Art and Design Incubator has been a home for two new businesses started by NMMU graduates, MooiMooii and MaXhosa by Laduma™. The mentoring and support received has enabled the graduates to make a name for themselves in the fashion world. Mentoring included guidance on developing a production cost model to ensure that their businesses are sustainable, and advice on how to approach customers and how to contract with agencies. Other support included access to small scale production machines. MooiMooii, started by Samantha Miller and Lauren Gravett, went into full production in March 2011, whilst they completed their BTech degrees in Fashion Design. They applied their academic knowledge while overcoming the challenges posed by starting a new business. Their slogan "effective style and functional ease" defines their style and the ready-to-wear clothing that they produce.



A model showing one of MaXhosa distinctive jerseys by designer Ngxokolo Laduma.

The MaXhosa by Laduma™ knitwear range has received recognition internationally after the creative designer, Laduma Ngxokolo, developed the range during his BTech degree in Textile Design. The incubator has played a critical role in growing his business as he continues to prosper. One of Laduma's key challenges was being able to manufacture in South Africa, as the downturn in the textile industry meant that many production facilities had closed. He has found a manufacturer in Cape Town, but still hopes to set up his own production plant in Port Elizabeth. Laduma has featured in a number of magazines such as *L'Uomo Vogue Italy* and South Africa's *GQ Style*. His jerseys are also featured in a television advert for a local alcoholic beverage.

NMMU has Solution for Internet Banking Fraud

The School of Information and Communication Technology has developed a device that could lead to the end of internet banking fraud. The Next Generation Internet Banking device creates a “clean” environment as soon as the 3G-enabled device is inserted, by rebooting the computer and encrypting all personal details. Major problems with internet banking such as phishing attacks, key loggers and unsafe malware were investigated to ensure a safer way of banking. “We wanted to eliminate these issues and create an operating system for banking only that boots your computer up in a safe environment,” said Prof Rossouw von Solms. Against the background of growing concern among internet banking clients that their money may not be safe due to the spate of SIM-swap fraud costing clients thousands, NMMU has developed a solution to curb fraudulent internet banking transactions.



Prof Rossouw von Solms

Banks continually refuse to compensate victims for money fraudulently transferred from their accounts. Banks usually claim that there is no evidence of any breach from their side and that the account holder must have disclosed their account login details to the online robber. On the other hand, illegal SIM-swaps have become very common to illegally intercept One-Time-Pin codes sent by banks to online clients to finalise a transaction. Banks and cell phone providers continue to claim innocence, but meanwhile clients are losing thousands of rands. Apparently, more than a thousand cases of online banking fraud have been reported over the last six months.

Researchers in the School of ICT at NMMU have done extensive work on improving internet banking security. Last year, NMMU patented a technology to isolate and protect the internet connection between the bank and the client to perform secure online transactions. The technology is based on a tailor-made operating system that boots-up the client computer from a USB stick. This operating system can only be utilised for online banking transactions and cannot be compromised or infiltrated in any manner.

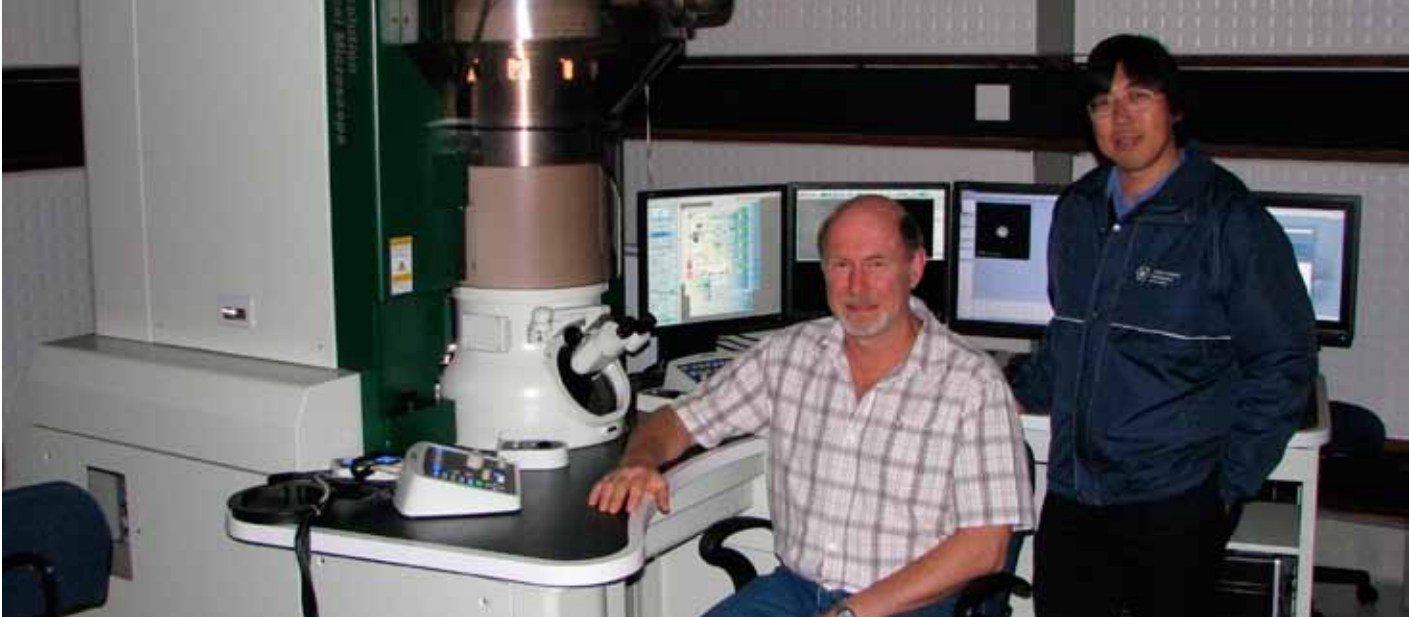
Further, a secure communications link is created between the client and the bank and cannot be compromised. NMMU Innovation Manager, Ms Mary-Ann Chetty, says: “The technology was demonstrated and offered to two of the major banks, but neither of the banks was interested. One bank acknowledged that the technology has the potential to cover most, if not all, current and future cyber-related threats. The bank, however, was not interested in the technology and according to them, ‘one more click’ is not acceptable to their online clients.”

According to Prof Rossouw von Solms, the leader of the research group that developed the technology, the solution really has the potential to successfully address most, if not all, current online banking risks. “All that we need is a bank that is willing to work with us to implement and fine-tune this technology. Then I shall do all my online banking in any internet café in any place at any time of the day and not be worried for a minute,” said Prof von Solms.



Prof Von Solms in discussion sessions with Masters and Doctoral students

Research Excellence



*Prof Jan Neethling and
Dr Eiji Okunishi from JEOL Japan*

Centre for High Resolution Transmission Electron Microscopy (HRTEM)

The Centre for High Resolution Transmission Electron Microscopy's research is focused on the application of high resolution and analytical electron microscopy techniques in the characterisation of strategic materials. These include materials used in fission and fusion reactors, cutting and drilling tools, coal fired power plants, opto-electronic devices, photovoltaic cells, catalysts for Sasol's coal-to-liquids technology, platinum alloys and various nanoparticle structures. Projects include:

- Radiation damage in nuclear reactor ceramics, diamonds and compound semiconductors;
- Microstructure and bonding in ultra-high pressure nano-polycrystalline diamond;
- Migration of fission products in nuclear reactor materials;
- Characterisation of nanoparticle catalysts;
- Microstructure and property assessment of creep aged stainless steel after welding;
- Life assessment of turbine rotor steel; and
- Growth and characterisation of ZnO based and nanoparticle dye solar cells.

Collaborations

The Centre is working with a team of Russian scientists (Dr Vladimir Skuratov, Mr Nikita Kirilkin and Mr Alexander Sohatsky from the Joint Institute for Nuclear Research in Dubna, Russia) on advanced materials for fusion and fission reactors; research on graphene is conducted in collaboration with scientists from Oxford University; research on diamond for electronic devices involves scientists from the University of the Witwatersrand; electron microscopy research on semiconductor devices, which include quantum dots and emitters of ultraviolet light, is performed for collaborators from NMMU's Physics Department and electron microscopy investigations on luminescent crystals, called nano-phosphors are performed for physicists from the University of the Free State. Close research collaboration with Sasol focuses on nanoparticle catalysts used in Sasol's coal-to-liquids technology. Collaboration

with Sichuan University in China has been initiated on ultra-high pressure nano-polycrystalline diamond. Various joint projects on the beneficiation of platinum, vanadium, zirconium and other metals involve researchers from iThemba Labs, the University of Cape Town and Stellenbosch University.

Projects

Radiation damage

Oxide Dispersion Strengthened (ODS) steel is a very promising nuclear reactor fuel cladding material because of its high swelling resistance and high temperature strength. Zirconium nitride (ZrN) is another promising ceramic that is being considered for an inert matrix fuel host for fast reactors. The Centre is investigating the effects of swift heavy ion impact on ODS alloys and ZrN as part of a collaboration with the Joint Institute for Nuclear Research (JINR) in Dubna, Russia.

The void distribution in neutron irradiated SiC obtained from Oakridge National Laboratory (in the United States of America), has been investigated as well as the migration of metallic fission products (silver and palladium) in neutron irradiated SiC. Other types of radiation damage investigated include neutron, proton and electron irradiated GaAs, hydrogen, helium and phosphorus (transmutation products in SiC), implanted SiC and silicon implanted nuclear grade graphite.

Fuel cladding

The Centre is interested in developing experience in the characterisation of zircalloys, friction stir welded zircalloys and SiC/SiC composites in order to participate in the envisaged future nuclear reactor build programme. Zircalloys are common fuel cladding materials; however, in the case of high burnup fuel, zircalloys react with water and absorb hydrogen, which can lead to hydrogen embrittlement of the zircalloy cladding. The feasibility of SiC/SiC composites for fuel cladding material is therefore being investigated internationally because of its high strength and chemical stability in the presence of high temperature water or steam. Collaboration with various institutions on these topics has been initiated.

Materials in coal fired power plants

As part of the Eskom programme to promote research activity and develop human resources, the Centre for Materials Engineering at the University of Cape Town has concluded a collaboration agreement with the Centre for HRTEM at NMMU to participate in the Eskom Materials Science programme.

The aim of this collaboration is to promote research excellence in areas that will support the power generation industry and the focus will be on the high temperature behaviour of engineering materials with emphasis on materials that are exposed to high temperatures and high stress conditions in coal fired power plants.



Projects by research area

Two current projects focus on the microstructure and property assessment of creep aged stainless steel after welding and life assessment of turbine rotor steel.

Catalysts

Collaboration with Sasol focuses on the characterisation of nano-particle catalysts used in Sasol's coal-to-liquids technology for the production of synthetic fuels. Research projects aim at developing Fischer-Tropsch catalysts that are active, selective, and stable. The participants in the research collaboration on catalysts have increased to include Sasol, the Centre for Catalysis Research at the University of Cape Town, Oxford University, and the University of Albuquerque in the United States of America.

Advanced Materials and Manufacturing

The Centre for HRTEM assists with the characterisation of the following semiconductor materials prepared in the Physics Department at NMMU: (In,Ga)(As,Sb) III-V semiconductors and nanostructures for infrared detection; (Mg,Zn)O and related nanostructures.

Ultra-hard materials used for cutting and drilling tools

Earlier research on the nanoscale characterisation of polycrystalline diamond (PCD) materials used as drill bit inserts for oil and gas drilling will continue with a new project on the characterisation of ultra-high pressure nano-polycrystalline diamond obtained from Element Six in the UK. In this project, the effect of sintering pressure and binder chemistry on the microstructure of PCD will be investigated. This project now also includes Sichuan University in China.

Diamond electronic devices

Research in collaboration with the DST Centre of Excellence in Strong Materials at the University of the Witwatersrand on radiation damage in carbon implanted synthetic and natural diamond is continuing. This research is aimed at creating a better understanding of implantation damage in diamond for the optimisation of high-power electronic devices. The Centre for HRTEM analysis of {100} platelets in natural (type Ia) diamond is progressing well.

Thin film solar cells

The Centre has embarked on the fabrication and characterisation of promising nanostructured thin film solar cells. The first project focuses on ZnO based and nanoparticle dye solar cells.

Joining and machining of materials

Friction stir welding (FSW) is a relatively new solid-state joining process. It can be used to join aerospace aluminium alloys and other alloys that are difficult to weld by conventional fusion welding. Collaboration has been initiated between the Centre for HRTEM, the Department of Mechanical Engineering at NMMU and the CSIR in Pretoria to do research on the zircalloys joined by FSW and other welding techniques.

International Visits

Dr Jaco Olivier and Mr Jacques O'Connell visited the Nuclear Engineering Department at the University of California, Berkeley, on 9 April 2012 to present research papers, discuss nuclear reactor topics of mutual interest and start the collaboration (initiated by Prof Neethling during 2011) between the University of California and the Centre For High Resolution Electron Microscopy at NMMU. Prof Per F. Peterson, the William and Jean McCallum Floyd Endowed Chair, in the Department of Nuclear Engineering, University of California comments about the research that was carried out at the Centre for HRTEM saying: "We were tremendously impressed with the work that has been done to understand mechanisms for release of radio active silver from TRISO fuel. It would be wonderful to be able to work together on additional projects."

On Friday, 1 June 2012, Dr Jamie Warner from the Department of Materials at Oxford University, shared the exciting news with *The Herald* reporters that the new JEOL high resolution transmission electron microscope (HRTEM) at NMMU had successfully produced very good images of single iron atoms in graphene. Graphene, which was discovered in 2004, consists of a single layer of carbon atoms packed in a honeycomb structure. Since it is stronger than steel and conducts electricity as well as copper, it has promising applications in future high-speed electronic devices. There are only a handful of research groups in the world who are able to perform this experiment.

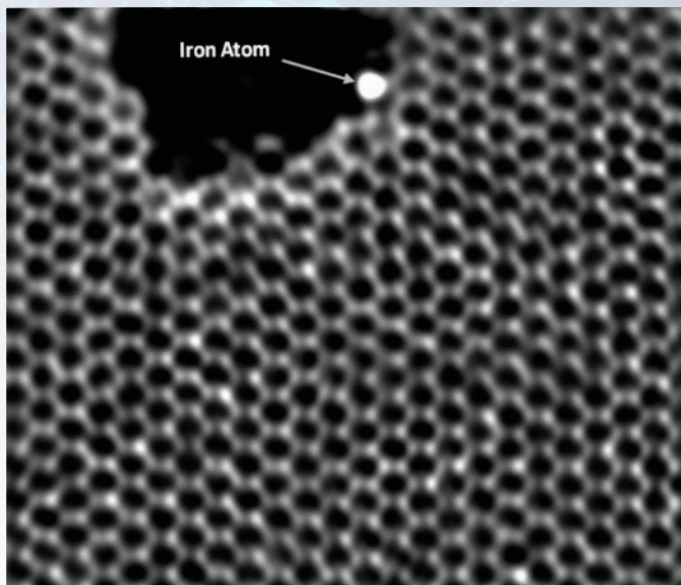


Image of single iron atom

Dr Warner remarked that the following four requirements must be satisfied in order to obtain these cutting-edge results: A good specimen, very good atomic resolution electron microscope, highly skilled electron microscope operator (Dr Jaco Olivier), and a well-designed and stable building such as the Centre for HRTEM at NMMU. This achievement proves that the Centre for HRTEM at NMMU has the equipment and expertise to participate in cutting-edge research programmes with top international scientists.

During the invited talk presented by Dr Jamie Warner from Oxford University at the 2012 European Microscopy Congress, in Manchester, he showed the HRTEM image of graphene and EELS results obtained at NMMU and he acknowledged the Centre for HRTEM. This work has now been published in *Nature Communications*.

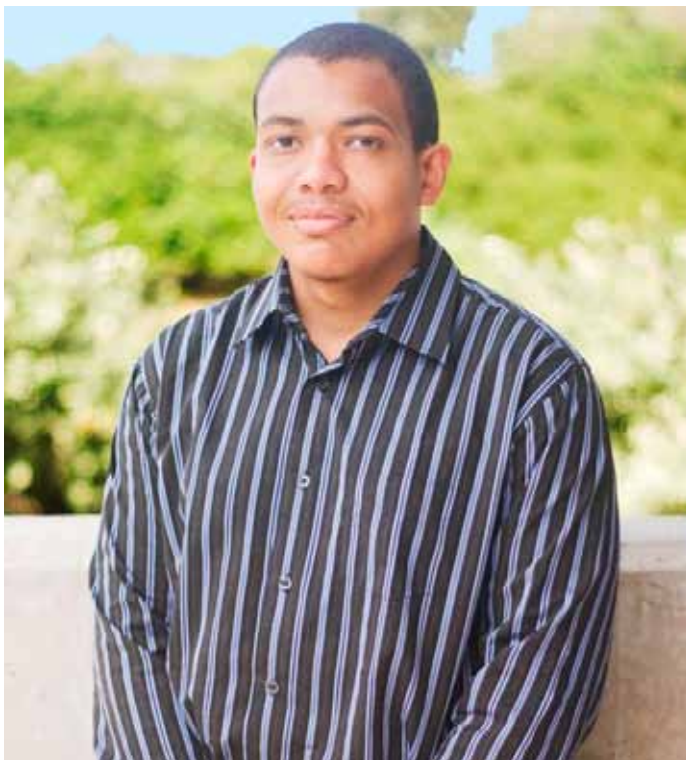


Postgraduate student Colani Masina explaining his PhD project on catalysts (supported by Sasol) to some of the international partners of NMMU's Office for International Education

A delegation of international partners of NMMU's Office for International Education visited the Centre for HRTEM on 22 August 2012. The delegation consisted of officials from Germany, USA, Brazil, Mexico and the Czech Republic. Prof Neethling first presented a talk about the research activities of the Centre to the delegation, thereafter they visited the laboratories to meet the students.

Mr Arno Janse van Vuuren, a PhD student at the Centre for HRTEM at NMMU, attended an International Atomic Energy Agency Workshop on Physics of Radiation Effects and its simulation for Non-Metallic Condensed Matter held at the Centre for Theoretical Physics in Trieste in Italy from 13 to 24 August 2012. He presented a poster entitled: Radiation Tolerance of Nanostructured ZrN against Swift Heavy Ion Irradiation, for which he was awarded a prize for third best poster amongst 41 participants from all over the world. The presenters of the three best posters were also invited to present their research results orally at the end of the workshop. Mr Janse van Vuuren's PhD project forms part of a collaboration with the Joint Institute for Nuclear Research in Dubna, Russia, supported by the NRF and Russia.

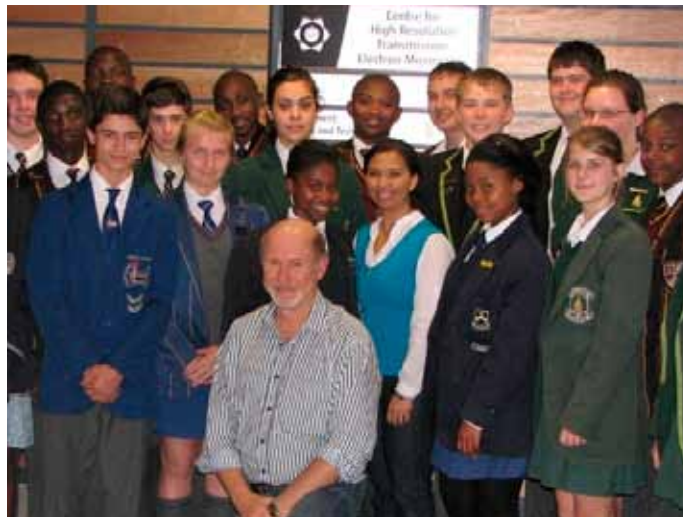
Mr Etienne Minnaar who received his MSc degree in April 2012, was awarded an Erasmus Mundus scholarship to pursue part of his doctoral studies at the Université Pierre et Marie Curie in Paris, France, from January to June 2013. For his PhD studies he is characterising Polycrystalline Diamond made by Element Six. "These are basically fake diamonds but they have similar properties to that of real diamond such as hardness, thermal and electrical conductivity". Mr Minnaar goes on to say: "Diamond is the hardest material known to man but its supply is slowly running out. Thus the diamonds that are being made by Element Six are of great importance and thus the analysis thereof is of great interest. These diamonds are being used as drill bit inserts by the oil drilling industry".



Etienne Minnaar

According to Minnaar, the University of Pierre and Marie Curie is also investigating another hard material that has similar properties to that of diamond namely Boron Nitride (BN).

Two school visits took place in October 2012 where students from local high schools were given presentations on Science and electron microscopy by Prof Neethling. They were also able to tour the facility.



Students from local high schools were given presentations on Science and electron microscopy by Prof Neethling.

“Green” Power at NMMU



Rooftop renewable energy research facility - North Campus

The School of Engineering at NMMU has taken a bold step towards the establishment of renewable energy sources with the installation of a renewable energy harvesting system on the roof of their North Campus building. NMMU understands the dire need to move away from fossil fuel derived energy sources to renewable sources.

The system was commissioned by three Mechanical Engineering students in January 2011 under the guidance of Dr Russell Phillips, and was made possible with funding from the Automotive Industry Development Centre's (AIDC) TEI Human Resource Programme and donations of equipment by local suppliers (Eveready, Willard and J&J Electronics). It consists of a photovoltaic array, three wind turbines, battery bank, associated controllers, and an inverter. "Currently, the energy harvested is used to power equipment in the Siemens laboratory located close to the source and we have high hopes to expand the system and power the entire laboratory and others in the near future," said Dr Phillips.

Apart from producing energy, the Renewable Energy (RE) system will be used as a research platform for postgraduate students conducting research in this rapidly evolving field. There are already a number of Masters students researching various innovative enhancements to increase the yield of energy from micro wind turbines. Furthermore, it will provide undergraduate students with a basic understanding of the various components in an RE system and the importance of integrating this technology into designs that they will undertake in their careers. The position of the system is highly visible to all and as such should create an awareness that such technology exists and is viable and ready for incorporation into domestic and work environments.

This inter-disciplinary project is an excellent example of synchronisation between the various units in the School of Engineering. Resources from the Advanced Mechatronic Technology Centre, VWSA/DAAD Chair and the Renewable Energy Research Group have made this innovative project come to fruition. "In the near future a live internet portal will be introduced, which will display information regarding the actual energy harvested and this information will assist designers of RE systems, particularly with regard to issues of financial viability," continued Dr Phillips.

VWSA-NMMU Solar Car

With the financial support from Volkswagen South Africa, the VWSA-DAAD Chair and the NMMU's Advanced Mechatronic Technology Centre (AMTC), NMMU engineering students were able to successfully design and build their very first solar car. The project entailed the design and development of a solar powered vehicle that exposed students across a range of study fields to conduct research into the renewable energy market and build on the base of accumulated learning. One of the main objectives of the project was to compete in the biennial South African Solar Challenge event from 18 to 28 September 2012. The challenge saw participants from all over the globe competing in a two-week race driving solar-powered vehicles across South Africa.

Awareness of the project was created amongst NMMU students through a competition requiring students to come up with a name for the solar vehicle, with the winner walking away with a third generation iPad. Over a thousand entries were received, with the Solar Car team voting on "Photon" as the most appropriate name for their vehicle. The vehicle was introduced to sponsors, key industry role players as well as local and national media at a spectacular launch event held at the NMMU Conference Centre. The event was the perfect send off for the team, who left for Pretoria two weeks later to participate in the South African Solar Challenge event.

Through Mr Tom du Plessis and Mr Marcus Reppening, VWSA once again greatly contributed to the project by making several of their vehicles available for the event. The vehicles included a Caddy, two Caravelles and a Sprinter. Even though the team didn't achieve the desired results during the 2012 South African Solar Car Challenge event, the project has had a major impact, not only at the University but also in Nelson Mandela Bay Metro. Throughout the duration of the project schools were invited to come and meet the members of the VWSA-NMMU Solar Car team and learn more about the exciting field of renewable energy. The project has greatly assisted in promoting the engineering field amongst learners.



VWSA Head of Production, Mr Tom du Plessis, and Prof Thoko Mayekiso, Deputy Vice-Chancellor: Research and Engagement, with the Solar Car team and key sponsors during the launch of the vehicle

Performing and Creative Arts Awards

Guitar Performance



Dr Rudi Bower

Dr Rudi Bower is regarded as a foremost ambassador of the guitar in South Africa. The classical guitar, in particular, has been central to most of his creative and scholarly output through the course of his career. As performer,

he has been instrumental in exploring new possibilities for the instrument with reference to original and innovative collaborations as well as the local development and documenting of the role of the guitar as solo concert instrument. As pedagogue and academic, his work has focussed on the developments in the construction of the guitar and how new construction techniques and materials utilised have impacted the repertoire and status of the instrument.

In 2012, he received an NMMU Award for the Creative and Performing Arts for his contribution to the inaugural Cape Town International Guitar Competition and Festival. Here he formed part of a select panel of national and international adjudicators as well as conducting a number of Master classes to many of the contestants. Dr Bower was also the recipient of the 2010 Emerging Faculty Researcher of the Year award. This synergetic role of performer and researcher has optimally positioned him to contribute pro-actively as well as reflectively to the continuing discourse of performance practice with special reference to the guitar. His most recent work focuses on the social impact, influence and significance of many of the important events, personalities and advances that occurred during the guitar's development during the course of the 20th and 21st centuries.

Current projects include the recording of a 'concept album' featuring musical compositions that portray, through a range of specific compositional techniques and transcriptions, the dual nature of the guitar - intimate, yet popular; personal yet accessible and practical yet reflective.

Arts and Culture



Michael Barry

Mr Michael Barry heads up the Arts and Culture Unit at Nelson Mandela Metropolitan University. He combines his research interests at NMMU with his art practice. The community engagement thrust of the Arts and Culture Unit has encouraged and afforded him an opportunity to explore his art practice through his many community engagement projects. Mr Barry received the Performing and Creative Arts award for his creative production output and professional practice as an artist and as an NMMU scholar. He recently completed his Masters thesis on "Issues relating to Institutional Culture at NMMU". He has been exhibited on various significant platforms



Two of Michael Barry's paintings

in South Africa and abroad and has completed numerous public art projects both as an artist and project manager. The most recent is a public art work(s) at the newly built Helenvale Resource Centre in Helenvale. Here he worked in close collaboration with learners from the community in developing two works that reflect the ideals of the young learners. The works are based on the ways in which the children of Helenvale, an extremely deprived area in Port Elizabeth, respond to their environment.

Mr Barry's art investigates the tension that exists between individuals and institutions and explores the way in which these tensions coexist. Presently, Mr Barry has completed a public art project with the MBDA (Route 67). The work represents the 1976 student uprisings in South Africa. It is a symbolic representation of the student uprising and the work incorporates figures, colours and text and is based on the stories of 1976 student uprising veterans living in the Port Elizabeth area.

Lastly, the "cultural" fight that has preoccupied him over the past 30 years has influenced his art both negatively and positively. Negatively, because he has often neglected to focus his full attention on his art resulting in a very mixed body of work (both qualitatively and quantitatively). Positively, because he has been exposed to the many layers of the art world ranging from artists, the politics of the arts, the new voices of the young exciting artists and the upper echelons of those who determine policies that influence the way in which the arts is practiced (or not practiced). All of this has had an influence on him, not only as a visual artist but as an individual who has a deep love of for the arts.



Research Chairs



Research Chairs provide a pivotal leadership link to the research teams across the broad spectrum of research endeavours; whether it is breakthrough research in HIV and AIDS within the higher education sector, or advances in automotive engineering, and international exposure-leadership and direction giving, the chairs prove crucial. Collaboration, engagement, remaining focused, encouragement and fostering the conducive research climate are cues set by the chairs.

HIV and AIDS Education Research Chair



Prof Naydene de Lange

The HIV and AIDS Education Research Chair, an initiative of the Faculty of Education at Nelson Mandela Metropolitan University (NMMU), aims to promote research and engagement within educational settings in general and within poor communities in particular. The role of the Research 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 third year of the work of the Research Chair has been exciting and several new projects have been initiated. These initiatives are also informed by one of the NMMU research themes, i.e. Health and Wellbeing. Addressing HIV and AIDS in South Africa is still a key priority and should be accelerated through the core business of universities, i.e. teaching, research and engagement. The revised Policy and Strategic Framework on HIV and AIDS for Higher Education (HEAIDS, 2012) assists in positioning HIV and AIDS Education as the concern of every academic in the sector. Research in particular, has a key role to play in contributing to knowledge production, but also to social change. Participatory research, for example, visual participatory research, where participants themselves determine the focus of the research, shape the research process, make their voices heard, envisage relevant solutions to their problems and take up their own agency, could contribute to social change. Social science research then not only produces knowledge, but also makes a difference, especially in the lives of the people in the communities we as universities serve. A framework of democratising research, which contributes to social change, frames the research of the Research Chair.

A visit to Prof Catherine Odora Hoppers, UNISA's Development Education Research Chair, was enriching and the discussions with her clearly pointed to the importance of a framework that guides the work of the Research Chair. The inaugural lecture, "Researching to make a difference in the age of AIDS – "the times they are a-changin'" (De Lange, 2010), published as *Researching to make a difference: Possibilities for Social Science Research in the Age of AIDS* (De Lange, 2012) in *SAHARA Journal*, puts forward the intellectual standpoint the Chair takes. Prof Odora Hoppers argues that our work as chairs require "truthful thinking", that our work should "consider

humanity first”, as our work is about “life and death!” Prof Moletsane, the Rural Education Research Chair at UKZN, shared in the discussions.

Research and Engagement Projects

Overview of current projects

Project: Every voice counts: Rural teacher development in the age of AIDS

Researchers: Naydene de Lange (Project Leader) with Deevia Bhana, Claudia Mitchell, Relebohile Moletsane, Robert Balfour, Volker Wedekind, Thabisile Buthelezi, and Daisy Pillay.

Description: This is a project within an established Research Niche Area that draws together various initiatives around teacher development in rural areas in the age of AIDS. The project has five discreet study areas, i.e. reflexive methodologies in studying teachers’ lives; school leadership and management of vulnerable children; teachers and youth as knowledge producers; community partnerships for addressing gender violence; and partnerships and pedagogies in preparing new teachers in the age of AIDS.

2012: Another year of funding was granted to allow for the finalising and wrapping up of the project, to reflect on and write up what had been achieved over the life of the project. Five books, 32 book chapters and 26 articles were produced.

A highlight was that another MEd student, Mari Van Wyk, a lecturer at UKZN, submitted her dissertation, “Shifting understandings: The professional development of student teachers doing their professional practicum in two rural schools in KwaZulu-Natal”, and graduated. Nonhlanhla Gasa, a teacher participant in the project, became inspired to complete a BEd Honours! Three Doctorates and five Masters studies funded through grant-linked bursaries have been completed. Three international students (two Doctorates and one Masters) also graduated drawing on the work in the project.

Project: New teachers for new times, visual methodologies for social change in rural education in the age of AIDS

Researchers: Naydene de Lange (Project Leader) with Mathabo Khau, Logan Athiemoolam and Cordelia Mazomba.

Description: The main purpose of this project was to explore how a cohort of pre-service teachers, in partnership with in-service teachers, could use visual

arts-based methodologies in their teaching to bring about social change in the age of AIDS. The second year of the project saw the placement of six Intermediate Phase teachers at a farm school, giving them “a farm school teaching practice experience”.

In earlier work in 2011, the teachers felt that the children were slipping through their hands. Asking what student teachers together with in-service teachers could do to address this challenge, and ensure that children don’t slip through their hands, the Chair started with a Participatory Visual Methodology Training Workshop (4 to 5 May 2012), introducing the six student teachers - along with the staff of the school - to drawing, collage, photovoice, and image theatre in preparing them to use visual methodologies in the context of HIV and AIDS. The student teachers were required to use these as pedagogies when teaching and addressing HIV and AIDS related issues at the farm school. The two weeks of teaching practice was followed up with a colloquium, where the panel of student teachers presented their teacher-in-training experiences and the panel of teachers presented their teacher experiences. This enabled further reflection and deeper discussion on teacher professional development. The students also presented their work at the Second Sustainable Rural Learning Ecologies (SURLEC) Colloquium, UFS QwaQwa Campus, 1-3 October 2012.

VWSA-DAAD International Chair in Automotive Engineering



Prof Udo Becker

In the Eastern Cape, the automotive industry has an important impact on the South African economy. The companies mainly focus on production and manufacturing of motor vehicles developed in automotive development centres for a global market in the northern hemisphere. This situation provides the region with a link to global industry and business.

The NMMU is the largest tertiary institution in the Eastern Cape with an engineering education programme responsible to serve this industry with well-trained automotive engineers on all academic levels. Due to highly innovative product development in this industry the education contents have to follow these trends and industry needs.

Therefore the establishment of the VWSA / DAAD International Chair in Automotive Engineering between Volkswagen South Africa, the German Academic Exchange Service (DAAD) and the NMMU was a necessary decision to support the engineering training in this global prospective.

In 2012, Prof Udo Becker was appointed as the new VWSA/DAAD Chair to the unit after Prof Theo van Niekerk served in the position for the past two years. Prof Becker hails from Germany and was previously the Head of the Institute of Automotive Engineering in Wolfsburg.

Establish Applied Research in Automotive Fields

To further collaborate in applied research with automotive industry and suppliers.

In 2012, five Masters student graduated under the VWSA/DAAD Chair and two journal articles were published. Mr Marc Hochheuser (pictured below) was one of the recipients of a Top Masters student award.



Top Masters graduate at NMMU (left to right) Prof Rossouw von Solms, Prof Theo van Niekerk, Mr Marc Hochheuser, Prof Thoko Mayekiso, and Prof Udo Becker

Research Project highlights:

Wireless mobile Android technology in the monitoring and control of a safety integrated robot cell

Mr Aidan Cumberlege, a Masters student, developed a mobile intelligent system that is based on Android to monitor and control production processes over a wireless network. The system is able to inform line technicians when process faults occur in the plant and make corrective action recommendations.



(Left to right) Mr Human from VWSA with Mr Cumberlege

Carbon footprint of the VWSA Paint Shop

Two German exchange students, Mr Pascal Mader and Mr Martin Lüddecke, who are both students from Ostfalia University in Wolfsburg, Germany were tasked with determining the carbon footprint of the VWSA Paint Shop. The research project entailed identifying the various problem areas in the VWSA Paint Shop, as well as to determine the amount of CO₂ produced during the painting process per vehicle manufactured.



German exchange students, Mr Pascal Mader and Mr Martin Lüddecke, with a VWSA employee

DST/NRF Research Chair in Nanophotonics (SARCHI)



Prof JR Botha

Prof 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.

Prof 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).

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 dollars.

This research group recently acquired a state-of-the-art scanning probe microscope courtesy of the NRF Research Infrastructure Support Programme and the 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.”

FirstRand Chair in Mathematics Education



Prof Werner Olivier

The FirstRand Foundation South African Maths 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 the NMMU commenced in January of 2011 and was set up alongside three other similar 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 previously disadvantaged secondary schools;
- improve the mathematics results (pass rates and quality of passes) in previously disadvantaged secondary schools as a result of quality teaching and learning;
- research sustainable and practical solutions to the mathematics crisis; and
- provide leadership in mathematics education and increase the dialogue around solutions for the mathematics education crisis.

The FRF Chair programme centers around the research and development of a modern teaching and learning model for NCS Mathematics that is 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 Maths scaffolding support for both teachers and learners at the FET level. In this regard, the FRF Chair in Maths Education programme over the past two years affected a comprehensive upgrade and extension of a successful Techno-Blended Mathematics Teaching and Learning (TBT&L) model that was initially developed by the Govan Mbeki Mathematics Development Unit. This web-independent model, which is fully aligned with and covers the complete NCS Mathematics curriculum, already, incorporates a range of innovative and exciting components to assist teachers and learners. These include access to dynamic visual presentations of the NCS Maths curriculum via specialised videos, syllabus content via mobile phones and the integrated educational use of calculator emulators, laptops, and Android Tablets.

Specific components of the TBT&L model also aim at a broader agenda of harnessing modern mobile technologies for flexible support and popularising the study of Maths and Science in schools. An example is a recent pilot implementation of a provincial Maths competition, Maths and Science syllabus support and exam revision via cell phones on Mxit.

A number of key school-based and other implementations of teacher and learner projects serve as a living laboratory to inform a comprehensive 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 Maths subject advisors.
- A GeoGebra professional development programme for in-service Maths teachers that is affiliated with the international GeoGebra institute based at Cambridge University, UK.

The Research and Development programme of the FRF Chair at NMMU also houses a number of postgraduate projects and collaborates with a number of other Maths engagement projects based at the NMMU. Active links also exist with external educational projects of national and provincial stakeholder departments including the Departments of Basic Education in the Free State and Eastern Cape, the MERAKA Institute (CSIR) and National Advisory Council Innovation (NACI).

GMSA Chair of Mechatronics

The GMSA Chair of Mechatronics was established in 2009 as a strategic partnership between industry and academia with focus on the field of automotive engineering. While the Chair has close ties with General Motors South Africa, it also has strong links with other members of local industry and with international research partners.

The primary objective of the Chair is to foster a collaborative partnership between academics and students in the university environment and practising engineers in industry. The strategic goal is thus to enhance human capital development in the automotive sector. These aims are accomplished through research, innovation and the undertaking of a variety of industry-based engineering projects.



Prof Igor Gorlach

The two main roles of the Chair can be summarised as the identification and establishment of new research opportunities and initiatives, and project-based cooperation with industrial partners.

Research project highlights:

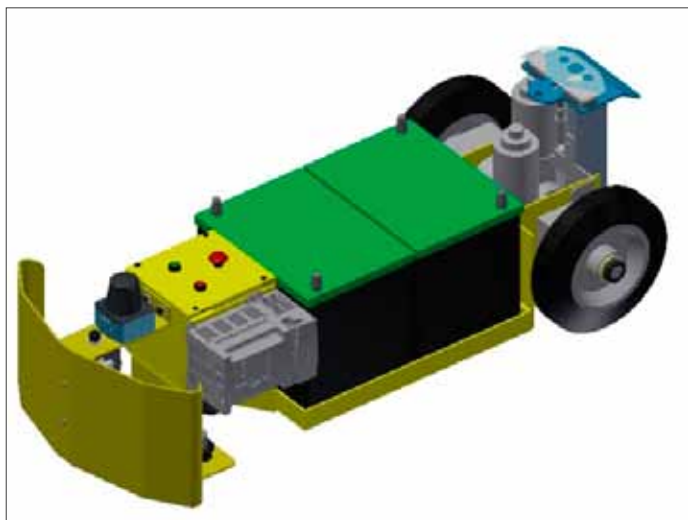
- The Chair has established several research collaborations with leading international universities and research institutions in several countries. The past year has seen several research visits by the Chair, Prof Igor Gorlach, to Aachen University (Germany), the Institute for Industrial Technologies and Automation - ITIA (Italy), and Reutlingen University (Germany). The primary research topics relate to advanced robotics, and

innovations and dynamic modelling of machine tools. Two postgraduate students also visited the German university partners at the end of 2012 to work on linked research projects. This research has culminated in several publications during this period.

- At the end of 2012, the Chair was able to finalise research collaboration with the University of Luxembourg (Luxembourg). This exciting new collaboration is closely linked with research initiatives aligned with Adam Opel AG, in the field of advanced manufacturing technologies in general assembly, and holds significant potential.
- The Chair research group has also developed a reconfigurable machining centre through the Advanced Manufacturing Technology Strategy (AMTS), a national collaboration initiated by the Department of Science and Technology (DST) that was completed this past year. In addition, research on the machining centre has also been linked to a local automotive component supplier.

Industry project highlights:

- A key task of the Chair is to manage industry-based engineering projects undertaken by students, particularly for General Motors. These projects are targeted at both undergraduate and postgraduate students, and 2012 was another productive year. Key elements of an intelligent station control system for one of the engine assembly lines at GMSA were implemented in the plant, the results of a project from 2011. An automated C-hanger cleaning station for the GMSA paint shop was also designed by undergraduate students in 2012, and is under review by engineers at General Motors for possible implementation.
- A key project was initiated at the beginning of the year, involving research on mobile robotics directly tied to a local industrial application. The project entails the design of a reliable, low-cost Automated Guided Vehicle (AGV) that is to be used within GMSA for material collection and delivery applications. This is an exciting research field and the low-cost focus of the design is intended to fill a gap in the market not covered by commercially available systems. The project also has significant potential for GMSA and other GM plants. The demonstration of the prototype AGV at the end of 2012 was well met by GMSA engineers, and work will continue on the initiative through 2013.



Automated Guided Vehicle (AGV) developed for GMSA

DST/NRF Research Chair in Microfluidic Bio/Chemical Processing



Prof Paul Watts

Prof Paul Watts has been the holder of the SARCHI Chair in Microfluidic Bio/Chemical Processing since February 2013. For the last century chemical manufacturing has almost exclusively been conducted in batch reactors; which necessitates massive investment in highly sophisticated production plants. As a result, fine chemicals and pharmaceuticals are generally manufactured in a small number of places and then transported where needed; further increasing costs. In order to improve South Africa's manufacturing capability new processing technology is needed; one potential option being continuous distributed production.

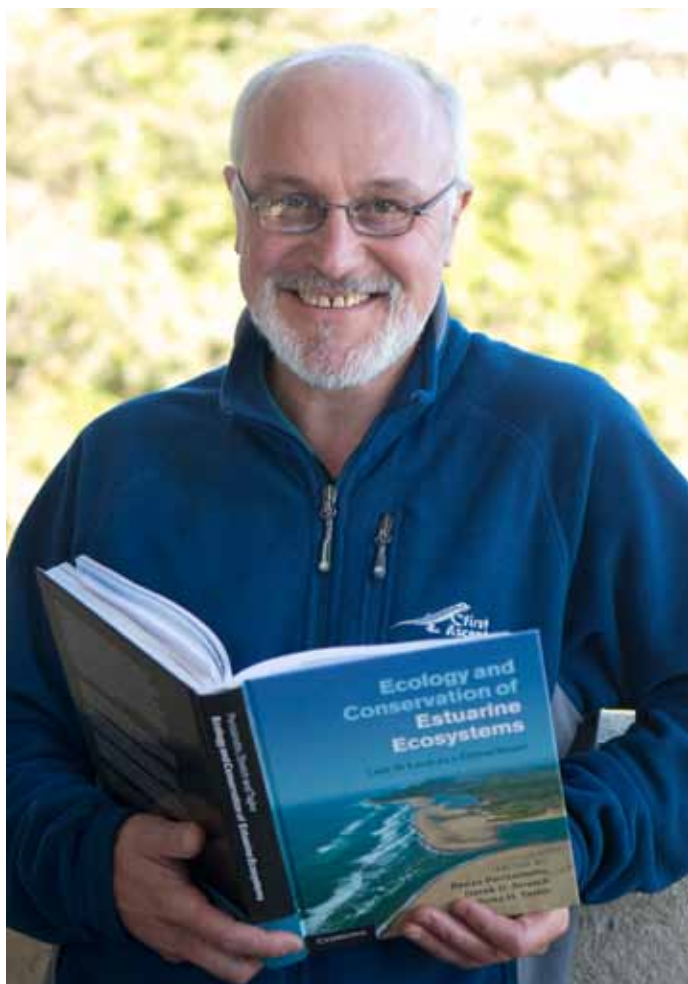
Continuous flow (or micro reaction) systems have been used in many different chemical reactions within academia; the results conclusively demonstrate that the technology offers many advantages in achieving greener, more efficient and chemically selective syntheses. These advantages can be attributed to the unique operating conditions associated with micro reactors in which reaction conditions, such as temperature, pressure, stoichiometry and residence time can be very accurately controlled. Although a large amount of research has been done developing the basic science, the last two years has seen an elevated level of interest from industry in adopting the technology. The Chair in Microfluidic Bio/Chemical Processing will significantly advance the existing research and training programmes of the NMMU's Institute of Chemical Technology by exploiting synergies between activities already in place at the NMMU, namely catalysis research and chemical/biochemical process development. In so doing, the Chair will strive to develop a unique "centre of excellence for bio/chemical processing using micro-structured reactor technology" at NMMU. As such, the Chair will make a substantial contribution to:

- (a) Chemistry research conducted within micro reactors;
- (b) The development of new processing technologies exploiting micro-structured reactors and small production platforms; and
- (c) The training of process chemists who are capable of exploiting continuous-flow production technologies.

In this way, the Chair will directly and indirectly contribute to strengthening and diversifying the chemical industry within South Africa. In addition to the

advantages of reaction control, continuous flow manufacture provides other significant benefits, including: (a) The change from batch to continuous processes will generate higher quality product, which can be validated using in situ process control; (b) Time and "point of need" flexible production; (c) Flexible up-scaling of production by increasing the number of parallel reactors; and (d) Safe control of hazardous reactions (e.g. highly exothermic and/or explosive, as well as reactions generating toxic intermediates) increasing worker safety. Overall, better control over chemical reactions during production using the principles of micro-structuring will lead to the development of new chemical methodologies, which would enable more sustainable use of South African resources.

DST/NRF Research Chair in Shallow Water Ecosystems



Prof Renzo Perissinotto

This Chair aims to generate new knowledge on the structure and functioning of shallow-water ecosystems, including any marine or freshwater body from the edge of the continental shelf to the smallest inland streams and ponds. Its broad objectives are: to provide management structures with scientifically-based information towards the sustainable use, and where necessary rehabilitation, of shallow water ecosystems in the southern

African region, with emphasis on the South African coastline; and to enhance the training of postgraduates, in order to secure critical and scarce skills availability for the future well-being of the country. The current holder of the Chair is Prof Renzo Perissinotto, a former Academic Leader in Biodiversity and Evolutionary Biology in the School of Life Sciences at the University of KwaZulu-Natal, Durban.

During its first five year phase, the Chair will attempt to fill major gaps in our knowledge of the biodiversity and food webs that underpin the current ecological functioning of estuarine systems (including their river tributaries), sandy beaches and associated surf zones, as well as freshwater-dominated coastal wetlands. On the one hand, the focus will be on those components that have been extensively researched in the past (e.g. Lake St Lucia, Sundays River Estuary and associated beach-surfzone, Swartkops Estuary, Port Elizabeth south coast), so that comparisons can be made with the conditions prevailing in these systems during a period preceding, or at the onset of, the current global change crisis.

The underlying principle is to establish the trajectory that these systems have taken in recent time, as a result of the multifaceted impact of global change, through the use of suitable indicators such as species richness and evenness, marine trophic index, food web shifts and how these have affected the overall functioning of the ecosystem involved. Information will be integrated with tolerance and ecotoxicological studies of dominant, keystone and endemic species, as well as physico-chemical data and models, in order to predict and study further the potential long-term effects of anthropogenic change on these systems.

Much of the current efforts of the Chair are dedicated to the study of Lake St Lucia, Africa's largest estuarine lake and a crucial component of the iSimangaliso Wetland Park, South Africa's first UNESCO World Heritage Site, established in 1999. Ecologically, this estuary plays a crucial role in the provision of goods and services, not only to the park, but also to the broader surrounding region. It is the most important fish and prawn nursery along the southeast coast of Africa. It also hosts some of the largest populations of hippos and Nile crocodiles in southern Africa, a large diversity of aquatic birds and important mangrove forests. Unfortunately, a combination of prolonged drought, freshwater abstraction and catchment/mouth manipulations in tributary rivers (especially the Mfolozi) has resulted in ten years of nearly continuous mouth closure in the estuary.

Desiccation and fragmentation of the lake region has prevailed until 2011, as a result of water levels falling below mean sea level and the development of extreme hyper-saline conditions. In order to rehabilitate the system and ensure its long-term survival, the iSimangaliso Park Authority secured the support of the Global Environmental Facility (GEF) and a project was initiated in 2012, with a grant from the World Bank, aimed at formulating longer-term management solutions for St Lucia. Prof Perissinotto is currently part of this GEF task team and, with his research group, has been working for the past ten years on the biodiversity and ecological functioning of Lake St Lucia, generating over 40 peer-reviewed publications, including a book titled *Ecology and Conservation of Estuarine Ecosystems: Lake St Lucia as a Global Model*, which was recently published by Cambridge University Press.

Recently, this Chair has also initiated a novel project on tufa stromatolites, in collaboration with SAEON, Rhodes University and a multidisciplinary team from NMMU allied departments. Marine extant stromatolites were recently discovered along an extensive stretch of the Eastern Cape coastline. This has offered an unique opportunity to investigate the structure and biogeochemistry of organic formations that are regarded as the most ancient representatives of life on this planet, dating back in the fossil record to the Precambrian era (ca 3.5 billion years ago). They represent another gem in the biodiversity richness of South Africa, being essentially “living fossils” and among the few examples of Proterozoic cyanobacteria still living in any marine environment. Modern cyanobacteria do not undergo skeletal calcification in marine waters, except under exceptional circumstances. Conversely, the tufa stromatolites recently discovered at Cape Morgan and elsewhere along the Eastern Cape coast exhibit a heavily calcified skeletal structure, reminiscent of the Archaeal stromatolite fossils of the Proterozoic. They are the only living type growing in supratidal to upper intertidal rock pools. Thus, detailed analysis of their structure and physico-chemical environment could reveal new knowledge of the hydrosphere and general conditions under which life on Earth began.

DST/NRF Research Chair in Earth Systems Science



Prof David Bell

A geochemist by qualification, Prof David Bell holds the SARCHI Chair in Earth Systems Science. This is a new field of science that attempts to look at the way Earth functions in a holistic way, integrating natural and social science disciplines relevant to Earth Systems and the human impact on them. The research focus of the Chair centres on the physical and chemical nature of Earth, planetary materials, the evolution and impact of solar system processes on Earth Systems. Cape Town born-and-raised Prof Bell completed his PhD in Geochemistry at the California Institute of Technology (Caltech). Prof Bell is also a founder member of AEON, which is now a priority DST project. His keen interest in deep earth studies led to his discovery of traces of water in minerals at great depth. This knowledge of how Earth stores water and gases is being used by scientists to investigate ways to isolate harmful industrial dioxide.

The Chair aims to establish an internationally-recognised programme of geochemical and mineralogical research that can serve to develop high-level research capacity, to further inter-disciplinary, trans-disciplinary and complexity-based approaches to the study of Earth system function and global change over deep time, and to apply this research to understand the evolution of ancient to modern planetary environments and of the southern African lithosphere and its surface, thereby contributing knowledge to the origins and sustainability of mineral, energy and water resources, to sustainable ecosystem management, and of our origins and place in the cosmos.

This proposed research programme is unique in its view of global change, offering a wider perspective than is commonly encountered. Whereas global change is frequently understood in the context of short-term changes to the behaviour of Earth's fluid envelope, experienced by humans, the research programme advanced here aims to place such variations in its full, long-term, planetary and evolutionary perspectives. Not only that, but to show how such change affected by the preceding processes of evolution in stellar systems. It attempts to touch on the phenomenon of global change at a variety of time and spatial scales, ending up at the practical level of human – environment interactions in a climatically vulnerable region of the country.

This enormous range of investigation is deliberate: on the one hand there is always the need to step away to gain some perspective on our scientific analysis. However, at a more profound level is the recognition that the problem of global change for communities, nations, or humanity is much more than a scientific problem and requires some appreciation and preferably practical experience with wider dimensions of human experience. Through its roots in hard science allied to parallel exploration of diverse broader inputs, this research programme aims at a realistic contribution to a national response to global environmental change.

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



Prof Patrick Vrancken

Prof Patrick Vrancken, by far the most senior academic in his field in South Africa, is the incumbent of the SARCHI Chair in the Law of the Sea and Development in Africa since 1 July 2013. His research focuses on Africa and the law of the sea, one of the oldest branches of international law, as well as the incorporation of the international law of the sea into the domestic legal systems of African States. He also has an interest in the legal aspects of marine tourism, a cutting-edge area that allows him to bring together his earlier research on tourism law and his present work on the law of the sea.

For a number of reasons, African States do not overall have strong maritime cultures, infrastructures and industries. This is reflected in the comparatively small number of research outputs produced by African researchers on the law of the sea as it applies to African States. Such a state of affairs resulted until now in African perspectives and issues being to too great an extent either overlooked in mainstream law-of-the-sea scholarship or, when they are dealt with, approached by non-African scholars. The research focus is aimed at building the momentum required to redress this situation by laying the foundations for the advancement of African indigenous knowledge in the law of the sea.

The Chair is ideally placed to make a major contribution to the maritime awakening of South Africa and the rest of the continent. Indeed, the draft 2050 Africa Integrated Maritime Strategy states that the development of Africa's maritime domain "requires innovative solutions and careful management systems to ensure its long-term sustainability, as well as the

implementation of national and international regulations and instruments to address current challenges amidst new, shifting global dynamics (e.g. shifting geographic trade patterns, emerging economic powers, environmental dynamics)" (paragraph 4). As a result, one of its objectives is to promote the ratification, domestication and implementation of the relevant international legal instruments (paragraph 21(x)) to address a wide range of maritime governance issues including illegal oil bunkering and crude oil theft; money laundering, illegal arms and drug trafficking; environmental crimes; container security and control programmes; flag State and port State control; hydrography; piracy and armed robbery at sea; maritime terrorism; human trafficking, human smuggling and asylum seekers; travelling by sea; strategic communications and cyber security; maritime spatial planning as well as environmental and biodiversity monitoring (paragraphs 60-80).

During the first five-year cycle, Prof Vrancken is focussing more specifically on the port legal frameworks of SADC States and State jurisdiction over foreign vessels in SADC ports. It is indeed imperative that appropriate legal frameworks are in place to regulate port assets and activities. Those legal frameworks need to take into account that African States can ill afford counter productive competition with one another. Instead, the SADC member States, for instance, have set as their objective to establish systems providing for fully integrated transport infrastructures and operations. Indeed, the States believe that the economic and social development of the SADC region will be promoted by the collective investigation and development of a common understanding with regard to "the provisions of their existing ... ports legislation and the need for a review thereof to provide an appropriate legal framework for the implementation of a common ... ports policy" (art 8.2(1)(c) of the 1996 SADC Protocol on Transport, Communication and Meteorology).

Moreover, as the African continent strives to take its rightful place in the global economy, the need to increase maritime safety and security as well as the protection of the marine environment together with the importance of improving living and working conditions on board ships require that African coastal States comply fully with their rights and obligations regarding the exercise of their jurisdiction over foreign vessels while in their ports. This is particularly the case for the SADC coastal States, because the maritime routes around southern Africa continue to be some of the most important global routes; the States' coastal waters are under threat from criminal activity both around the Horn of Africa and in the Gulf of Guinea; and the region is surrounded by inordinately vast expanses of high seas in the south-eastern Atlantic Ocean, the south-western Indian Ocean and the Southern Ocean, which all require ever-increasing policing.

In this regard, the research is expected to bring greater clarity to the rules addressing the conflicts, which may arise between the port State and the flag State while a foreign vessel is in one of the SADC ports. Indeed, there is at the moment no fully uniform approach to resolving the issues concerned, which have been further complicated in recent years by the steps taken to enlarge the jurisdiction of port States in an effort to increase the level of enforcement of international treaties regarding matters such as labour standards, maritime security, the protection of the marine environment and vessel safety.

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 2012, 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 29 registered research entities. At the highest level were institutions (three), followed by centres (eight) and units (eighteen). The entities fulfilled their mandates successfully during 2012 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 - 181
- Books and book chapters - 27
- Conference papers - 343
- Masters and Doctoral graduates - 130
- Patents - 5

NAME	LEADER	FACULTY
INSTITUTES		
InnoVenton: Institute for Chemical Technology and Downstream Chemical Technology Station and its sub-entities	Prof Ben Zeelie	Science
Friction Processing Research Unit	Prof Danie Hattingh	EBEIT
Institute for Information and Communication Technology Advancement	Prof Rossouw von Solms	EBEIT
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
Centre for Research, Technology and Innovation	Prof Paul Webb	Education
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
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	
Centre for the Advancement of Non-Racialism and Democracy	Mr Allan Zinn	

INSTITUTES

Institute for Information and Communication Technology Advancement (IICTA)

Leader: Prof R von Solms



Prof Rossouw von Solms

The mission of IICTA is to stimulate and promote quality ICT research, relevant ICT education and training, ICT contract work, conferencing, consulting and community service. Through its various sub-entities of Information Security Management and Governance, Health Informatics, End-to-End Service Design, Usability and User Experience and Enterprise Knowledge Engineering the mission of the entity is realised.

A number of highlights and achievements were reported for 2012. Here are a few of the outstanding ones:

- There was an increase in the number of research outputs in the form of nine journal articles, of which five were in international indices and four from South African journals. Thirty two conference papers were delivered, of which sixteen were at international conferences. One book chapter and one book were published during the period under review and one patent application was submitted for registration.
- Prof M Herselman received a C3 NRF Rating for the period 2012-2016.
- Prof Paula Kotzé was invited by the World Health Organisation (WHO) to take part in the "WHO Global Forum on Health Standardization and Interoperability" that took place at the WHO Headquarters in Geneva, Switzerland from 3 to 4 December 2012. The Forum was attended by representatives from the majority of countries around the world who are planning to, or have implemented, e-health solutions.
- Prof Johan van Niekerk presented a cyber-security talk to student leaders from 14 South African universities at the ACUHO-I-SAC Conference (Association of College and University Housing Officers International: Southern African Chapter).

Friction Processing Research Institute

Leader: Prof DG Hattingh



Prof Danie Hattingh

The Friction Processing Research Institute (FPRI) aims to support NMMU's mission, to identify and serve the needs of the international/national friction processing community by contributing to sustainable development through high-quality research, technology development and continuing human resource development. The scope of the entity's activities include: expanding the boundaries of technology by means of technology analysis and innovation to align research outputs with industry needs; engage in research to grow knowledge in the field of friction processing with a focus on process optimisation, modelling and material characterisation; and advancement of existing research infrastructure with good student supervision.

In September 2012, it was agreed that FPRI be restructured as a unit (FPRU) within eNtsa. The unit, in conjunction with eNtsa will continue to enhance innovation, knowledge generation and technology transfer. This process has now been completed.

The following achievements, in 2012, are highlighted:

- The Southern African Institute of Welding (SAIW) awarded Prof Hattingh with its Gold Medal Award "in recognition of his vision and leadership in developing a friction stir welding technology unit at the Nelson Mandela Metropolitan University at the very forefront of this technology and applying the process commercially in industry to solve complex problems".
- The year under review, 2012, was also the year that eNtsa celebrated its tenth anniversary on 24 May 2012 via an Open Day session where industry partners, NMMU Management, academics and staff were allowed to view the achievements of the entity and the progress made.
- An international experiment was conducted entitled "residual stress field introduced by localised induction heat treatment of thick-walled components". The experimental aim was to assess the effectiveness of the application of in-situ induction heating for the post weld heat treatment (PWHT) of friction hydro pillar process (FHPP) welds applied on-site to thick walled steel steam pipes as used by power generation facilities.
- FPRI had six students graduating from the group with two PhD's and four Masters students.

- One of the PhD projects contributed to the development of new technology, allowing Eskom to affect major cost savings, resulting in the NMMU being awarded the Eskom Chairman's Award for Innovation in 2012.
- Seven national conference papers were delivered and six journal articles were published in international indices. Five patents were filed.

InnoVenton/DCTS – InnoVenton: NMMU Institute for Chemical Technology and Downstream Chemicals Technology Station

Leader: Prof B Zeelie



Prof Ben Zeelie

InnoVenton's mission is to provide effective training of high-level manpower through the integration of knowledge and generating new knowledge that makes a critical and constructive contribution to regional, national and global sustainability. The research focus of InnoVenton remains strongly on product and process development, and is primarily focused on the development of alternative products and production methodologies, mainly for the downstream chemicals sector. In South Africa, there is common acceptance across government and industry role players that the key challenge to the future growth and sustainability of the chemical industry is to increase beneficiation in the downstream chemicals sector, which is significantly under-developed in comparison with the basic chemicals sector. As a result, government and other role players have developed a number of development and support schemes to support development initiatives in this sector. To date, none of these development initiatives have been particularly successful. Our approach to addressing the lack of progress in the development of the downstream chemicals sector is threefold, namely:

- The establishment of new business ventures based on technologies developed by InnoVenton;
- The introduction of new technologies in existing businesses; and
- The training of high-level manpower for the industry sector through postgraduate Research and Development (R&D) training and the provision of continuous training opportunities to people within the sector.

In 2012, InnoVenton has continued to respond to specific strategic interventions and plans that included the shift in focus to include more Teaching and Learning activities that would provide a more stable financial basis in future. There has also been a shift in its R&D focus from smaller projects into much fewer larger

projects. InnoVenton currently focuses on two major projects, namely the micro algae-to-energy project (a DST demonstration project) and bio-plasticizers. The following may be seen as highlights for the Institute during 2012:

- Placed top in the Technology Innovation Agency's (TIA) benchmarking exercise of South Africa's 16 Technology Stations Management Practices.
- Awarded the Nelson Mandela Metropolitan University (NMMU) Engagement Team Award.
- Agreement with the TIA regarding a further R14.9 million funding for years two and three of the micro algae-to-energy project.
- Selection of the Micro algae-to-Energy project by TIA to be put on a "fast-track commercialisation" path.
- Two PhD students and ten Masters students completed their studies.
- One book was written, two journal articles were published in international indices, nine national conference papers were delivered and 27 formal reports were produced. These figures show that one major report or proposal had to be completed at a rate of one every one and a half weeks.
- One South African patent was filed for the integrated process of micro algae cultivation, fresh water recovery, and bio-crude oil production.

CENTRES

Telkom Centre of Excellence

Leader: Prof J 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. The Centre comprises of three units, namely: The Distributed Multimedia Application Unit (DMA) whose main focus is to investigate the development of intelligent user interfaces (IUI's) for contact centre management and coordination. An overview of the new project, UbiServe: A Model for Ubiquitous Interaction with Internet-Based Services and Information, is given in the table below:

Personal Information Data	Functions	Natural User Interface Devices
1. Personal data	1. View data	1. Mobile phone
2. Web Service data	2. Search data	2. Laptop
3. Sensor data	3. Retrieve data	3. Tablet
4. Social data	4. Store data	4. Multi-touch surface
	5. Organise data	
	6. Rank data	
	7. Enable/disable notifications	

Ubiquitous computing (UbiComp) refers to a new genre of computing in which the computer completely permeates the life of the user. In ubiquitous computing, computers become a helpful but invisible force, assisting the user in meeting his or her needs without getting in the way. UbiComp is a post-desktop model of human-computer interaction (HCI) in which information processing has been thoroughly integrated into everyday objects and activities. In the course of ordinary activities, someone "using" UbiComp engages many computational

devices and systems simultaneously and may not necessarily even be aware that they are doing so. A real opportunity thus exists to investigate the potential of Ubicomp in the South African context. The second leg of the Centre is the Optical Fibre Characterisation Unit (OFC) that conducts research on the factors necessary for upgrading to the Next Generation Network (NGN) in South Africa. A focus area entitled: “Modelling and experimental investigation of advanced PMD, nonlinear effects and modulation format on the performance of next generation optical fibre networks” was granted funding by the African Laser Centre for the duration of 2012 – 2013.

It is a collaborative project uniquely linking the following four African university research groups: Optical Fibre Research Unit (NMMU), University of Eldoret (Kenya), Makerere University (Uganda) and the University of Carthage (Tunisia). The project made good progress during 2012 in investigating critical factors that limit the maximum data transmission achievable by a laser within an optical fibre. Particular success was made in investigating the interaction between PMD, nonlinear effects, Raman amplification and polarization influences. The Photovoltaics (PV) Unit represents the third unit in the Centre. It aims to design and build a prototype Laser Beam Induced Current (LBIC) system for use in characterising solar cells and PV modules and linked to this to develop a prototype concentrator photovoltaic system for remote applications. To celebrate the 25th anniversary of the Postgraduate Programme in Renewable Energy at the University of Oldenburg, Germany, Prof van Dyk presented a lecture entitled: “Development of Low Concentrator Photovoltaic Modules” and gave an overview of the low concentrator photovoltaic (L-CPV) research at NMMU, with a focus on the significant results obtained in various L-CPV projects. Highlights and special achievements during 2012 were:

DMA Unit

Masters student Mr Patrick Tchankue won the best paper award for a paper in the HCI category at the South African Institute for Computer Scientists and Information Technologists (SAICSIT) 2012. His work has received international recognition, including keen interest from Dr Bryan Reimer at MIT in the USA. An article on his work appeared in *Engineer IT*. An Honours student, Mr Cainos Mukandatsama, won the best postgraduate project at the Vodacom Student Symposium in November 2012. His project was a mobile pill reminder for the elderly, which reminded elderly patients on chronic medication to take their medication on time and informed caregivers of any deviations. The Department was also awarded the Best Department Award in the field of Mobile Computing.

OFC Unit

A number of exciting new projects were undertaken in 2012, including: involvement in Square Kilometre Array (SKA) project, funding for an ALC Fibre Workshop, assisting NMISA on a Telkom Project, new interaction with the UKZN Quantum Communication Group, and a new project involving VCSEL laser sources for novel telecommunication application.

PV Unit

Dr Freddie Vorster was invited to serve on the steering committee of the newly formed Wind Energy Centre, a national initiative to promote wind energy in South Africa. Prof Ernest van Dyk was invited to serve on the IUPAP Working Group on Energy.

Several students had papers accepted at conferences; three were international conferences and 31 were national conferences. Eight journal

articles were published in international indices. Two PhD degrees and six Masters degrees were awarded.

Centre for African Conservation Ecology

Leader: Prof G Kerley

The mission of the Centre for African Conservation Ecology (ACE) is to develop scientific knowledge of the ecology and conservation of African ecosystems, especially in the Eastern Cape and adjacent regions of high biodiversity, which will enable society to make wise environmental management decisions. In achieving its mission, ACE will build human capacity through postgraduate training, which has been further enhanced through a significant increase in research outputs. Below are some highlights for the period under review:

- Twenty-eight refereed scientific publications, all of which were published in international indices.
- Sixteen conference papers were delivered. Nine were at international conferences and seven were delivered at national conferences.
- Two Honours, eleven MSc and fifteen PhD students are busy with their degrees, while seven MSc students and three PhD students graduated during 2012.
- Staff and students of ACE made a substantial contribution to science management in South Africa and further afield, and high levels of community service were achieved, particularly through the Grysbok Environmental Education Trail.
- Ms Hayley Clements won the prize for Best Student Presentation at the South African Wildlife Management Association Annual Symposium.
- Mr Adriaan Grobler was awarded the Albert Wessels Award, the NMMU Vice-Chancellor's Award, the Rupert Gesinstigting Award and the S2A3 Bronze Medal Award.
- The signing of a MoU with the Swedish Agricultural University is important in terms of the financial support it allows for, as well as the international recognition it reflects for ACE.

Centre for Energy Research

Leader: Dr E van Dyk

The Centre for Energy Research's (CER) mission is to serve the energy needs of the region by means of training students and conducting applied energy research. Staff and students of the CER make a valuable contribution to energy research and the energy field in general in South Africa. The CER also engages with several local and national companies, doing contract research. Highlights and special achievements during 2012 were:

- Eskom's Tertiary Education Support Programme
 - a. PV module and system characterisation, and solar thermal investigations; and
 - b. Wind and solar thermal.
- DST – Centre for Renewable and Sustainable Energy Studies (CRSES)/DST: The CER is a partner with the Fort Hare Institute of Technology in the PV spoke for the CRSES/DST hub.
- Nelson Mandela Bay Municipality (NMBM): The CER is collaborating with the NMBM on various projects, including embedded generation (PV and Wind), and solar water heating.
- National Laser Centre (NLC): High Resolution Laser Beam Induced Current

(LBIC) characterisation of defects in solar cells.

- African Laser Centre (ALC): Collaborative research projects with Makerere University (Uganda) and Kenyatta University (Kenya).
- Energy storage and materials analysis: Various projects on materials characterisation and evaluation for Willard Batteries.
- Wind Energy: Investigation of various areas of this important field, including resource assessment and embedded generation using small (< 20 kW) wind turbines. This also involves the installation of small wind turbines at the ORF for development and ongoing research. The Wind Energy Research Group (WERG) in the School of Engineering is associated with the CER.
- Seven articles were published in international journals.
- One international conference paper and 23 national conference papers were presented.
- Two MSc students graduated.

Centre for Expertise in Forecasting

Leader: Prof I Litvine

The Centre for Expertise in Forecasting's (CEF) primary mission is to serve the forecasting needs of South Africa through training students and conducting applied research. Its vision is to become a recognised centre of forecasting expertise in South Africa and internationally. During 2012, international relations with France, Norway, Ukraine, Turkey, and Egypt have grown. In its endeavours to achieve its mission and vision the following outputs were generated during 2012:

- Two Masters and five Honours students graduated.
- Three international conference papers were presented.
- Completed phase 2 of the Energy Demand Forecasting project for Eskom.
- Completed the postdoctoral project: The role of energy derivatives in liberalised electricity market of Ukraine.
- Completed two Masters projects on:
 - a. Statistical Model for Diversification in Renewable Energy; and
 - b. Weather Neutral Models for Short-Term Electricity Demand Forecasting.
- Project for Social Housing Regulatory Authority (The Development of the Tenant Audit System and the Pilot Study of nine Social Housing Estates).

Centre for the Advancement of Non-Racialism and Democracy

Leader: Mr A Zinn

The Centre for the Advancement of Non-Racialism and Democracy (CANRAD) seeks to harness collective institutional capabilities in relation to academic endeavours in research, teaching and learning, evidence-based advocacy and interventions in advancing non-racialism and democracy. Specifically, the Centre strives to undertake cutting-edge social research, educational engagement and advocacy aimed at raising public understanding and policy support for the pursuit of a non-racial, democratic South Africa (SA). In its fourth year of existence, CANRAD continues to build strong networks and partnerships locally, nationally and internationally: eight local; four regional, seven national and another seven international. Community structures

continue to be strengthened, i.e. South African National NGO Coalition (SANGOCO), Northern Areas People Development Initiative (NAPDI), School Sports, History and Heritage initiatives (NAHHP) amongst others. In 2012, CANRAD hosted international speakers from the South Sudan, Brazil, Scotland and the USA. The "Difficult Dialogue" series held internally and The Herald/Nelson Mandela Metropolitan University (NMMU) Community Dialogues in the metro continue to draw attention and an opportunity for public dialogue. Four well-attended (100 - 1000) provocative public dialogues and two smaller book launches were held in 2012. CANRAD continues to be the administrative host of the Anti-Racist Network in Higher Education (ARNHE) until 2013. NMMU's value: "Respect for Diversity" continues to be deepened during the month of August as CANRAD coordinates over 50 programmes and events across five campuses with faculties, divisions and units. The Women's Day Walk (9 August) in collaboration with the Faculty of Law, was particularly poignant as female judges attending a conference at NMMU all participated. Numerous public meetings were successfully held to discuss a variety of topics that advance non-racialism and democracy, such as:

- "The Rights of Chiefs versus the Rights of the People: Do we need the Traditional Courts Bill in 21st Century South Africa?" Ms Nomboniso Gasa (researcher and gender activist); Nkosi Patekile Holomisa (ANC MP) and Funeka Soldaat (Khayelitsha community activist and Founder Chairperson of Free Gender) were speakers.
- Prof Crain Soudien "Words Matter! Understanding race and racism in South Africa".

In 2012, research publication units generated were 2.83 units and three NMMU students graduated, one undergraduate and two postgraduate students. The CANRAD Resource Centre now contains 40 DVD's of events (dialogues, seminars, colloquia and conferences) from 2010 to date.

Building Environment Research Centre

Leader: Prof W Shakantu

The Built Environment Research Centre conducts cross-faculty cutting-edge built environment industry originated research, facilitates the learning of industry sponsored MSc and PhD candidates, and engages in extensive collaboration with other research institutes regionally, nationally and internationally. The Centre hosts three PhD, three Masters, a Postdoctoral Fellow and a Research Associate. In 2012, Centre researchers published four journal articles, of which two were in international indices and two were published in South African journals. Twenty-three conference papers were presented at international conferences and ten conference papers were presented at local conferences. One chapter was generated for a book.

Centre for Educational Research, Technology and Innovation

Leader: Prof P Webb

The Centre for Educational Research, Technology and Innovation consists of two units, viz. the Action Research Unit and the Science, Mathematics and Technology Education Unit.

Action Research Unit

The objectives of the unit are to contribute towards whole school improvement, effect improvement in the personal/professional practice of teachers, provide opportunities for faculty members to become involved in action research, raise the community engagement and research profile of the Faculty of Education and provide undergraduate students with opportunities for research.

Science, Mathematics and Technology Education Unit (SMATE)

The objectives of the Unit are to contribute towards improvement in Science, Mathematics and Technology Education in South Africa, provide opportunities for staff at NMMU to become involved in research and development projects, and raise the community engagement and research profile of the Faculty of Education. In 2012, the following achievements are highlighted:

- Seven articles were published; five in international indices and two articles were published as international conference proceedings.
- Three papers were presented at international conferences.
- Two PhD studies were supervised to completion. Six PhD student projects were supervised during the course of the year as well three Masters degree studies.
- The continuing collaboration with Professors Jean McNiff (York St. John University, UK) and Ortrun Zuber-Skerritt (Liverpool Hope University and Bath University, UK).
- Various invitations were made to members of the Centre to present keynote addresses on developing scientific literacy in Tunisia and Sweden.
- The IT in Schools Project Leader won the Emerging Engagement award for 2012.

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.



*Dieticians: Nadia-Marie Booysen, Nadia Gous and Claudine Louw
(Research Team: Department of Health, Northern Cape)*

Institutional research is on-going and 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 publish three journal articles in accredited journals. An article: "Learning via English: Experiences of 12 indigenous African trainee-teachers at the University of KwaZulu-Natal (UKZN)" has also been accepted by a review panel and is in press for *US-China Education Review*. A multi-centre research study that is being 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), is envisaged to be presented at an International Symposium on management of moderate malnutrition in Vienna, May 2014. 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 Mr 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 dietitians to obtain part of their annual compulsory CPD points.



*Dr Liana Steenkamp, Ms Phumeza Mkontwana and Dr Jill von der Marwitz
(third from the left) – NMMU Dr Mlulami Mabandla, Dr Mahlubandile Nxele
and Dr Nomso Stubbs (PE Hospital Complex)*

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 in 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.

Research Capacity Development

Encouraging a vibrant culture of research and innovation

Nelson Mandela Metropolitan University is committed to nurturing the next generation of researchers, with Masters and Doctoral students supervised by some of Africa's leading researchers. Among the mare Zoology's Prof Graham Kerley, Botany's Prof Janine Adams, Dr Phumelele Gama, senior lecturer in Botany, and Prof Carminita Frost, an associate professor in Biochemistry. They have collectively mentored over 100 Masters and Doctoral graduates.

Prof Kerley, Director of NMMU's Centre for African Conservation Ecology has a broad range of research interests, but his main focus has been on how animals use resources such as food and shelter and what the consequences of this are, as they relate to species co-existence or conservation. His research has covered mega-herbivores such as elephants and rhino as well as apex predators like lion and cheetah.

Prof Kerley says: "As a supervisor, you want to be able to make a real contribution and provide the correct level of guidance. Students looking for projects and supervisors need to ensure they identify a supervisor who has the experience, focus, time and resources to be able to look after their academic development."



Prof Graham Kerley

Prof Adams – a water and estuary authority, and president of the Southern African Society of Aquatic Scientists and fellow of the Royal Society of South Africa – has just completed her four-year term as Chair of South Africa's Water Research Commission. She is also one of the country's leading experts on estuary conservation and management. "Our contribution was on the response of estuary habitats to human impacts and climate change effects."



Prof Janine Adams

As a supervisor, Prof Adams said clear channels of communication between student and supervisor were critical – and students needed to be self-motivated. "It's a good idea to check the track record of your chosen supervisor, i.e. have past students completed in the recommended time frame? Also look for opportunities where there is trans-disciplinary collaboration."



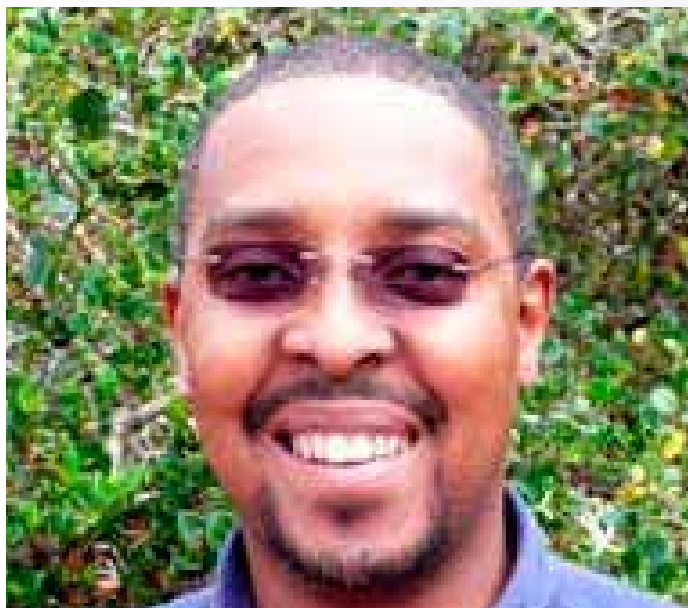
Prof Carminita Frost

Prof Frost, through her research, aims to contribute to the knowledge base of better understanding of metabolic diseases such as diabetes and cancer. "In the case of our diabetes research, we routinely test numerous products from natural sources such as indigenous plants to determine their ability to alleviate these symptoms."

Prof Frost said the highlight of the supervisory role was "the ability to contribute towards building capacity in the next generation of biochemists". "An excellent supervisor allows a student to develop holistically by creating an environment of mutual understanding and responsibility."

"The supervisor should be able to identify the strengths and weakness of each individual candidate and assist in building and developing the student to reach their full potential, not only in their scientific approach and philosophy but also for life."

Senior Botany lecturer Dr Phumelele Gama's main research interest is micro-algal ecology. "We are using micro-algae as a vehicle to understand the ecology and functioning of temporary wetlands within the Nelson Mandela Bay area." Like Prof Adams, Dr Gama highlighted the importance of communication between supervisor and student. "Students should feel comfortable questioning certain paradigms without fear of being criticised."



Dr Phumelele Gama

Postdoctoral Fellowships

During 2012, the NMMU hosted a total of 24 Postdoctoral Fellowships. Ten fellowships were funded by the NMMU Council, and internal departments or units, while fourteen fellowships were funded or co-funded by external funders including the NRF, Claude Leon Foundation and the MRC. The NMMU contribution in respect of fellowships totalled R1 748 166.

Dr Kyung-hwa Yang, a postdoctoral fellow in the Faculty of Education states that her main area of research is centred on participatory visual methodology, such as participatory video and photography. She is particularly interested in participatory video, which refers to a process in which research participants (such as members of a community) create a video together to address issues they face. Her Doctoral thesis was based on this process. She intends to explore participatory visual methodology to give a voice to people in underserved communities or whose voice has not been recognised in academic work.

The major research project that she is involved in is cellphilmaking (creating a video with a cellphone) with learners in Grade 8 at a primary school in Port Elizabeth on the topic of HIV and AIDS. Approximately twenty learners discussed the topic together and created four group cellphilms.



Dr Kyung-hwa Yang, postdoctoral fellow

Dr Yang is currently in the process of data generation of a new research project with pre-service teachers at NMMU and at DePaul University in the United States. The two groups of pre-service teachers are prompted to talk about critical social justice issues that teachers need to grapple with in classrooms and video record their discussions. Once they edit their videos, each group will have an opportunity to see the videos created by the other group of teachers and to have a virtual conversation via video conferencing. This project is to explore participatory video in teacher education and also to highlight issues of social justice from pre-service teachers' perspectives. The final videos may be used in teacher education programmes.

Dr Yang's research activities were performed in collaboration with Prof Naydene de Lange, HIV and AIDS Education Research Chair at NMMU and her postdoctoral research supervisor, and her research assistant.

Dr Yang collaborates with Prof Claudia Mitchell (McGill University, Canada), Prof Karen Monkman (DePaul University, USA), Dr Berit Lungren (Umea University, Sweden), Dr Kathleen Pithouse-Morgan (University of KwaZulu-Natal, SA) and Prof Relebohile Moletsane (University of KwaZulu-Natal, SA).

Erasmus Mundus Scholarship

In 2012, the NMMU participated in the ema2sa (Erasmus Mundus Scholarship Programme) as part of a consortium with four South African Higher Education Institutions and eight European Partner Institutions (University of Leuven – Leuven, Belgium; Freie Universität – Berlin, Germany; Pierre et Marie Curie Université – Paris, France; Masaryk University – Brno, Czech Republic; University of Amsterdam – Amsterdam, Netherlands; University of Hull – United Kingdom; Vrije Universiteit Amsterdam – Amsterdam, Netherlands; Karolinska Institutet – Stockholm, Sweden and Universidad de Granada – Granada, Spain). Through this programme mobilities ranging from three months to twenty months were made possible for three early career NMMU staff members, two PhD and four Masters candidates.



Ms Unathi Lutshaba, recipient of an Erasmus Mundus Scholarship

Young Scientist Best Podium Presentation Award

Ms Razia Gaida was the joint runner-up of the Young Scientist Best Podium Presentation Award at the Academy of Pharmaceutical Sciences (APSSA) Conference, 12-15 September 2012, Rhodes University, Grahamstown. Ms Gaida spent six months at the Karolinska Medical Institute in Stockholm, Sweden during her Masters study as a recipient of the Erasmus Mundus Scholarship, and completed six Masters modules pertaining to Global Health.

Razia Gaida graduated with an MPharm degree in the Department of Pharmacy at NMMU in April 2013. Her Masters dissertation was entitled "Treatment of Parkinson's disease in South Africa and investigation of risk factors causing dyskinesia" under the supervision of Prof Ilse Truter and Prof Jonathan Carr from the Department of Neurology, Stellenbosch University.

In addition to research on Parkinson's disease, her other research interests are neurological disorders and global health issues such as infectious diseases and women and child health. Ms Gaida is co-author of three podium presentations at local conferences and three poster presentations at international conferences.

Ms Gaida reported as follows on the international conference she attended earlier this year and where she presented a poster: "The 11th annual Alzheimer's disease/Parkinson's disease conference was held in Florence Italy. Set in a beautiful city, the conference was truly a congregation of the greatest scientific minds from all over the world. The amount of research taking place throughout the rest of the world is astounding and instils hope for healthcare professionals and patients alike in terms of the two most common neurodegenerative diseases in the world. The number of presentations was enough to keep participants enthralled for hours on end and the poster presentations provided wonderful opportunity to interact with the researchers. Personally, this was the first international conference I had attended and it was an experience to remember. I returned each evening educated and inspired."



Prof Sarel Malan, President of the Academy of Pharmaceutical Sciences congratulating Ms Gaida

Research Capacity Development Initiatives

The NMMU has continued to make substantial investments in initiatives aimed at realising its strategic vision around increasing the research capacity of emerging researchers. These initiatives have included:

An **Early Career Development Programme (ECDP)**, targeting academics in the early to mid-years of their career, drew eight participants in 2012; 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;
- Challenge the role of each participant in terms of future academic leadership as a new generation of academics.

Below are reflections of a few of the programme participants:

"Nearing the completion of the ECDP, I was able to put together a realistic and measurable five-year plan, which could be embedded into my EDS. The workshops were thought-provoking and allowed participants to strategise around issues of Teaching and Learning, Research and Engagement."

"The programme [ECDP] prepared me for my promotion from associate lecturer to lecturer as the programme kept me motivated to teach with conviction and purpose as well as participate in research activities."

"The sessions were enlightening and educating. They made me also meet and interact with my colleagues from other departments and different facilitators, which would have been impossible to network with without these ECDP sessions."

The Next Generation Initiative (NGI) was continued in 2012. In the first semester of the year, five candidates participated but this reduced to three later in the year. The Next Generation Initiative Programme has the following main goals:

- To make a significant contribution towards growing a cohort of potential staff as part of the next generation of academics;
- To address the organisational transformation needs of the NMMU in ensuring that there is a pool of academic staff from the designated groups;
- To produce and retain the next generation of academics and to ensure that they have the intellectual and academic capabilities related to teaching and learning, research and community engagement;
- To advance redress and equity with regards to Africans and women.



Ms Sam Kahts, participant of the Next Generation Initiative



Mr Ikho Bambiso, participant of the Next Generation Initiative

The following are sentiments expressed by programme participants:

"The NGI has meant a lot to me as it has allowed me to further my studies and also helped me improve certain skills. I am grateful to be part of it."

"The NGI has certainly given the candidate and me as supervisor/mentor the opportunity to focus on the task at hand and not to waste valuable time on trying to secure funding to retain the candidate. It has given the candidate confidence that her potential is recognised and has motivated her to go beyond the call of duty. She is not only doing excellent research, but is making a valuable contribution towards the teaching and learning component of the Department."

Three streams of Research Capacity Development workshops were offered to the NMMU research community during the 2012 academic year. The first stream included general topics related to research methodology and research skills whilst the second stream focussed on dissemination skills namely, preparing abstracts and conference presentations (both oral and posters) as well as writing retreats. Workshops in the third stream were tailored towards enhancing research supervision skills.



Staff receiving feedback at a writing retreat

The Scholarship of Engagement



Prof George de Lange

Director: Academic Engagement and Collaboration

One of the strategic goals of the University is to become a responsive and engaged institution that contributes to a sustainable future through critical scholarship. The NMMU's engagement activities continue to expand through a wide range of partnerships and collaborations with external stakeholders resulting in the generation of new knowledge and other scholarly outputs, which benefit both its internal and external communities. The University's definition of engagement is that it is a reciprocal process of mutual sharing of knowledge, skills and resources between itself and the broader community to enrich scholarship, research and creative activity; enhance teaching and learning; strengthen democratic values and civic responsibility; contribute to public good and transformation and to enhance social, economic and ecological sustainability. The channels of interaction and activities taking place between the NMMU and its external communities fall within the four broad categories of engagement, they are engagement through service and outreach, teaching and learning, the provision of professional and discipline-based service and through research.

NMMU's engagement activities continue to expand through a wide range of partnerships and collaborations with external stakeholders resulting in the generation of new knowledge and other scholarly outputs, which benefit both its internal and external communities.

The term "scholarship of engagement" first used by Boyer redefines an academic's scholarly work from the application of academic expertise to engaged scholarship that involves an academic in a reciprocal and collaborative partnership with non-academics in the broader community, it is interdisciplinary, and involves the integration of the teaching and learning and service activities of academics. It involves academics in academically relevant work that simultaneously meets the vision and goals of the university as well as the needs of the broader community.

The University distinguishes four elements that should underpin its engagement activities, namely:

- Be reciprocal and mutually beneficial and involve a two-way flow of knowledge and there should be a high potential for joint learning that strengthens scholarly activities;
- Be informed by scholarly activity that is practice-based and grounded in the contextual realities of the communities served by the University;

- Allow for mutual planning, implementation and assessment among partners, which includes external stakeholders, students and staff; and
- Be integrated and embedded into the core functions of teaching and learning and research.

One of the major contributing factors to the growth in the scholarship of engagement within the NMMU is the growing number of research and engagement entities, which serve as enabling structures for engaging with the broader community. The discipline driven faculty based entities as well as centralized institutional engagement enabling structures provide the necessary support for engagement activities as well as support for integrating engagement activities linked to research, teaching, service provision and outreach. It is understood that the manner in which knowledge can be used and applied through engagement varies between disciplines, for example in applied disciplines such as engineering and some of the natural sciences, it differs from fundamentally theoretical disciplines, in these disciplines direct channels of application exist, in theoretical disciplines it may be long-term and indirect.

One of the major contributing factors to the growth in the scholarship of engagement within NMMU is the growing number of research and engagement entities that serve as enabling structures for engaging with the broader community.

Opportunities for collaborative partnerships with external stakeholders also differ as factors such as the nature of industries situated in the local and regional economy, although this may not be applicable to all disciplines. In the case of mechanical engineering, the presence of the automotive and automotive component industry has provided the opportunities for collaboration and extensive partnerships resulting in the establishment of industry funded chairs and specialised discipline based training and testing facilities.

The number of outputs generated from the scholarship of engagement and specifically by entities have increased as a result of engagement gaining more prominence as the third core function of the University. The faculties most active in producing outputs through engagement and collaboration with external partners include entities in the Faculty of Education (Mathematics and Technology Education Unit, Action Research Unit, Centre for Community Schools and Visual Methodologies for Social Change Unit), the Faculty of Engineering (eNtsa, Volkswagen International Chair of Automotive Engineering, Advanced Mechatronic Training Centre, General Motors Chair of Mechatronics), the Faculty of Science (InnoVenton, Centre for African Conservation Ecology, Centre for Expertise in Forecasting and Coastal and Marine Research Unit).

The common characteristics of these research projects are that they are more local (rooted in a particular time and setting), applied, collaborative, multi-directional in terms of sharing expertise and knowledge gained, are often not University-centered and campus bound as they are located in settings outside of the University. A variety of outputs are generated, which include publications, reports, academic qualifications, commercialisation, registration of patents, conference presentations, and creative outputs.



The Amajingqi Traditional Area, Willowvale

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



The Faculty of Arts' mission is to have a vibrant culture of research and scholarship with a critical mass of researchers associated with each major discipline in the faculty; and to foster locally, nationally and internationally competitive research themes in areas of strategic importance. The Faculty of Arts aims to achieve these ideals through the promotion of traditional and applied research in the humanities, social sciences, and the performing and creative arts.

The year under review in the Faculty of Arts has been marked by steady growth in the academics' engagement in research and scholarship. We are pleased with the increasing number of research active staff as a result of several interventions including but not limited to research capacity development, writing retreats, mentorship in areas of theoretical framework and basic research methods.

The year under review in the Faculty of Arts has been marked by steady growth in the academics' engagement in research and scholarship.

In the Faculty of Arts, we actively promote research and scholarship that has a potential to not only raise the profile of the faculty and NMMU, but also to make a sizable and constructive contribution to the betterment of the human condition. The research we conduct across the humanities and the social sciences will address many social, cultural, economic, and technological challenges facing our nation, Africa, and the global community.

As NMMU's Vision 2020 eloquently states that our institution strives to become a dynamic African university recognised for its leadership in generating cutting-edge knowledge for a sustainable future. It is within this context, that the Faculty of Arts embarks on a strategic drive to encourage and support all academics to engage and actively seek to harness their research competencies. We do this through a number of initiatives, namely:

- Through hosting writing retreats;
- Providing financial support for conference attendance and presentation;
- Editing of dissertations and thesis for faculty members completing their postgraduate studies;
- Through providing opportunities for staff to participate in workshops and trainings harnessing competencies in basic research skills; and
- Understanding and application of theoretical frameworks in research and in general academic writing.

We continue to enhance the quality and impact of research and scholarship in the Faculty of Arts; build areas of research strength, and further mobilise and exchange our research with national and international partners.

These and related activities have provided an enriching and supportive environment for staff to be ready for, and become effective in their support and supervision of postgraduate students and maintain academic excellence. These efforts are starting to show results; the quality of the proposals and final theses and dissertations of postgraduates are gradually improving; staff members' publications are improving; this year, one staff member obtained an NRF rating.

We continue to enhance the quality and impact of research and scholarship in the Faculty of Arts; build areas of research strength, and further mobilise and exchange our research with national and international partners. The capacity to address interdisciplinary research questions and problems is encouraged to all of our faculty members and students. As such, the Faculty of Arts' strategic goals are:

- Harness research themes into clusters with potential to develop leaders in their fields;
- Increase the number of accredited research articles through improved supportive and yet rigorous culture of research;
- Enhance the opportunities for honorary professorship, visiting scholars, and postdoctoral fellowships for the Faculty of Arts as a strategic way of increasing the research outputs;
- Emphasise the social and cultural impacts of our research (knowledge mobilisation) in the Humanities and Social Sciences, Creative and Performing Arts and promote our research more vigorously; and
- Develop a better system for recording, training, preserving, archiving and making accessible a wide-range of seminars, colloquium, and publications of the Faculty of Arts members.

Moreover, the Faculty of Arts aims to create and sustain a community of scholars committed to:

- Free and open enquiry;
- Academic excellence and the inherent value of research in the humanities and social sciences;
- Providing opportunities for our students to develop the attributes and capacities required for leadership and global citizenship; and
- Bringing the methodologies and insights of our disciplines to bear on many of the fundamental questions facing humanity today through basic research and engaged scholarship and debate.

Through our research we aim to discover new knowledge and ways of understanding the human experience and culture. Through diversity and rigour of our research agenda and programmes we seek to provide our students with opportunities for learning that reflect and manifest these values.

Prof Velile Notshulwana
Executive Dean: Faculty of Arts

Faculty Researcher of the Year



Prof Helize van Vuuren

Prof Helize van Vuuren's research focus is on Afrikaans and English literature and literary history, plus San orality as recorded in the local literature. Of increasing importance is comparative South African literature and orality within a global literary framework. She collaborates with international Khoisan folklorist, Dr Sigrid Schmidt (based in Germany and linked to the Basler-Afrika Namibian Resource Centre in Switzerland). This research interaction with Dr Schmidt, author of the renowned *Katalog der Khoisan-Volkserzählungen des südliche Afrikas*, has brought about curriculum reform of NMMU courses towards an African focus, plus a possible new publication of folktales.

Prof van Vuuren reviewed JC Kannemeyer's 752-page first writer's biography on J.M. Coetzee. This was followed by a review of Breyten Breytenbach's collection of "late work" poetry, *Katalekte*. The concept of "late work" (described by Edward Said in *On late style*, 2006, via Adorno's analysis of Beethoven's music) was introduced, and is being refined by Prof van Vuuren for South African literary study. This work is reflected in separate accredited articles on Breytenbach (2011), JM Coetzee (2012) and DJ Opperman (forthcoming). Subsequent to these publications, Prof van Vuuren was invited to give guest lectures on Coetzee at the JM Coetzee Nobel Laureates festival (Richmond, Karoo), and on Breytenbach at the first Breytenbach festival in Montagu, July 2012. Two Masters dissertation students, Ms N Venter and Mr C Tait, are at present pursuing research into Breytenbach's oeuvre and late work.

Prof van Vuuren reviewed JC Kannemeyer's 752-page first writer's biography on J.M. Coetzee.

The reclusive Adam Small, coloured anti-apartheid Afrikaans poet and UPE honorary degree graduandus of 1999, was honoured in a special issue of the ISI rated journal, *Tydskrif vir Letterkunde*. For this occasion Prof van Vuuren contributed a reworked version of an earlier 1996 interview with the poet, who had fallen silent for the previous two decades. In *Stilet* she published her reflections on the best approaches to extinct cultures, such as the Xam (previously called the "Cape Bushmen"), forming part of her project on San orality and South African literature.

Prof van Vuuren has been an established NRF scholar since 2002. She is mentoring emerging NRF researcher, Dr Marisa Botha, a postdoctoral NRF scholar (2011-2013). Dr ML Crous and Prof van Vuuren co-edited an issue of the Afrikaans accredited journal, *Stilet* (Volume 23/2) in 2012. She is widely engaged academically, serving on the seven person Literature commission of the SA Academy of Arts and Science, on the editorial board of various academic journals, extensively engaged in postgraduate external examining, prize committees for Afrikaans literature, and NRF rating of researchers.

Prof van Vuuren is a member of the Dutch Maatschappij der Nederlandse letterkunde, International Comparative Literature Association, and chaired the Afrikaans Literature Association from 2008 to 2012.

Visual Social Commentary

Dr Heidi Saayman-Hattingh's research interests lie in South African social documentary photography, in particular how photographers have chosen to represent society. Previous research surveyed the foundations of South African social documentary photography by comparing it with international trends and investigating the ways in which it has challenged and shaped, as well as been challenged and shaped, by the outlook of its practitioners.



Dr Heidi Saayman-Hattingh

Social documentary photography is not the province of any one special interest; rather it is the outcome of a complex web of factors – personal, social, political and cultural. By taking the photographers themselves as the central thread, this research reflected on the complex reasons and motivations involved in South African social documentary photography, dealing with issues such as generation, gender, ethnicity, photographer background, working conditions as well as national and international factors. Essentially the research covered the 1980's photography as a weapon in the struggle, the 1990's photography in the struggle for political supremacy, as well as post-1994 looking at what the younger generation of photographers are covering. Her current research focuses on iconic images (in particular the use and re-use of the Hector Pieterse image) and global identity as well as contemporary social commentary. The new area of interest she is moving into is more personal. She comes from a family of traders and addresses the roles of women traders in the Transkei during the 1940's and 1950's based on memory work and family photographs.

***Essentially, the research covered
the 1980's photography as a weapon
in the struggle, the 1990's photography
in the struggle for political supremacy,
as well as post-1994 looking at
what the younger generation of
photographers are covering.***

She was a postdoctoral fellow for three years at Nelson Mandela Metropolitan University, hosted by the Department of Applied Design, which gave her opportunities to facilitate research workshops, supervise MTech students and mentor staff members on the Phuhlisa programme at NMMU (with the opportunity to take part in many of the workshops offered to the mentees). In 2012, Dr Saayman-Hattingh went to Helsinki in Finland and presented a paper entitled: "Photographers Actively Commenting on Social Images in South

Africa.” This paper dealt with a post-apartheid generation of photographers who continue the activist tradition of previous years dealing in particular with issues such as AIDS awareness, tuberculosis and lesbian rights.

She has promoted three Masters students, two of whom graduated cum laude. She has co-authored a paper with one of the Masters students entitled: “The Female Figure as a Representational Character Within the Autobiographical Picture Narrative”. This student, Ms Nina Joubert, was also selected as the winner of the Masters Degree in Technology by Dissertation at Nelson Mandela Metropolitan University. She also received a scholarship from the American Council of Learned Societies bursary. Mentored by Prof Darren Newberry (previously her doctorate promoter), a professor of Photographic History and Director of Postgraduate Studies in the Faculty of Arts, University of Brighton. Her research addresses the “intricacies of visual communication”. She is striving to create an understanding of South African visual culture and she holds the second Doctorate in photography in the country.

Societies in Transition



Dr Joleen Steyn-Kotze

Dr Joleen Steyn-Kotze’s research agenda focuses on democratisation and societies in transition in a comparative tradition. She is particularly interested in the challenges that states face when creating democracy once they have abandoned an authoritarian political system. She is not only focusing on South Africa, although she draws a lot from it, but also focuses on other non-Western regions. Dr Steyn-Kotze states that “we in South Africa are basically living democratisation at the moment”. Under the broad theme of societies in transition, she is able to explore issues like “how do we equalise society”? and “what is meant by equality”. She is also able to delve deeper into issues of nation-building and national identity. She is also interested in how communities interact with the government. For example, “service delivery protests are not a revolt against the ruling party- but rather a reminder to the ruling party that you promised us this and that – where is it?” Society is beginning to demand the democratic deliverables or democratic goods. The structures set to promote interaction between state and civil society do not always work well. Societies therefore find “creative” ways to express their frustration.

Under the broad theme of societies in transition, she is able to explore issues like “how do we equalise society”? and “what is meant by equality”.

Dr Steyn-Kotze published a paper on “Non-racialism, nation-building and Democratic Consolidation in South Africa”. This paper had started an academic conversation on the question of “what do we mean when we talk about non-racialism?” Dr Steyn-Kotze also participated in the national State of Political Science Study seeking to address amongst others the state of political sciences in South Africa, the relevance of the discipline, and what are the new developments for the discipline.

In lieu of this paper, she will represent South Africa at the International Political Science Association’s Roundtable on the State of Political Science in Montreal in July of 2014. She also launched the “Born free research project” looking at the political values and attitudes, looking at the emerging middle-class democratic generation. For the first time in 2014, children who grew up in an exclusively post-apartheid and democratic South Africa will be able to vote. We do not really know a lot about their views, and how they feel about current challenges. These are kids who “never lived the realities of a post-apartheid state” – but they are still battling the legacies of an apartheid state like poverty and inequality.

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Her work is of use to the IEC (Independent Electoral Commission) and she also does work for the African Conflict Monitor through addressing issues like: “How to create a post-revolutionary state following the Arab Spring Revolutions?” and exploring obstacles that undermine political stability in the North African post-revolutionary region.

The “Born Free Project” has led to a collaborative working relationship with the University of Fort Hare, and Rhodes University.

Dr Steyn-Kotze collaborates with Prof Gary Prevost from the University of St John’s in the USA and holds a teaching fellowship at the University of Osnabrueck, Germany on their Democratic Governance and Civic Engagement Summer School.

Philosophy and Humanity



Prof Andrea Hurst

Prof Andrea Hurst works in the interstices between philosophy, psychoanalytic theory, complexity studies and ethics in order to address the perennial philosophical question of what it means to be human. This includes developing a complex model of subjectivity, which takes its cue from Lacanian psychoanalytic theory. An article outlining this model was published in the *SA Journal of Psychology*, and related articles have appeared on the complexity of human development, the reciprocity of shame in oppressor and oppressed, the idea of intimate revolt and self-transformation, and the notions of fundamental fantasy and the Real. She envisages consolidating this research in a book that develops philosophical heuristics for complexity thinking, which may be usefully applied in contemporary humanities research.

Research highlights for 2012 included three articles (on complexity, human development and fantasy in personal identity-formation) that were published in accredited journals. She attended four conferences, three of which were international: the annual Congress of the Psychology Society of South Africa, the International Congress for Psychology in Cape Town and (a highlight) the Fifth International Conference on Global Studies in Moscow.

She envisages consolidating this research in a book that develops philosophical heuristics for complexity thinking, which may be usefully applied in contemporary humanities research.

She was also invited by the Faculty of Health Sciences to present five enrichment lectures on complexity, Lacanian psychoanalytic theory, and Philosophy in contexts; a five day Article Writing Workshop at NMMU (with Ms C Christie and Prof M Watson), and a two-day workshop on Critical

Thinking. She initiated an informal collaborative research project with a member of the Psychology Department on developing an understanding of narcissism, and a related highlight for her was receiving an invitation to join a group of international Lacanian scholars to participate in a five day workshop at Stellenbosch University in 2013 on the notion of a pathoanalysis of everyday life.

There were two main enablers for her 2012 journal publications. The two articles on complexity and human development were enabled by collaboration with and support from Prof Richard Haines of Development Studies in 2010 and 2011. The third article was enabled by an Erasmus Mundus Scholarship for Academic Staff Exchange, which allowed her to spend two months visiting the Katholieke Universiteit Leuven at the end of 2011. All of these articles benefitted from first being presented at conferences and subsequently revised and refined before submission to journals.

She believes that all philosophical thinking is collaborative in the sense that ideas are always developed within a shared discourse and ideally discussed thoroughly with colleagues. Her appreciation of the value of collaboration can be seen in her sustained efforts to develop national and international partnerships. In 2011, she was involved in the initiation of the annual Wildcoast Symposium: a collaboration of philosophers at Rhodes University, University of Fort Hare and NMMU.

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In 2012 its theme was Philosophy and Place, and in 2013, the Philosophy of Love. This collaboration resulted in an invitation in 2012 to collaborate with Prof Abraham Olivier, from the University of Fort Hare and Dr Rafael Winkler, from the University of Johannesburg in setting up a Phenomenological Society in South Africa. She was invited by Prof Philippe van Haute of Radboud University, Nijmegen, to collaborate with eight national and international scholars in a project of developing a Lacanian style pathoanalysis of everyday life. Although collaboration is essential, she adds, philosophical writing is by nature individualistic. In her words: "In the same sense that nobody can die for me, nobody can articulate precisely my thoughts or share responsibility for them."

She thinks of the NMMU values (diversity, excellence, Ubuntu, integrity, respect for nature, and responsibility) as philosophical values that drive research as such. In her opinion, one of the best ways to maintain your research activity is to present papers regularly at conferences. This forces you to work towards specific deadlines that cannot be extended, which means that your research work cannot endlessly be deferred.

Digital Media



Dr Bianca Wright

Dr Bianca Wright's research is multi-faceted and to a certain extent eclectic as it deals with digital media in its broadest sense. "I think that for the most part my research draws on the NMMU value of Ubuntu as I am seeking to understand new ways of using media to communicate messages, especially social messages around today's real global issues such as climate change, poverty reduction and so on. The idea that we are linked through our being as humans resonates in the way that we use digital media to communicate. We can choose to use it in trivial ways or we can choose to start leveraging the real potential of these technologies to enact real change. Technology alone is not enough; we need to examine the factors that underpin the situations we find ourselves in and encourage people to engage with the issues surrounding the use of digital media."

The idea that we are linked through our being as humans resonates in the way that we use digital media to communicate.

Dr Wright graduated with her DPhil in Media Studies on "Games as Communication: An Analysis of Advergaming in South Africa." Her supervisor, Prof Danie Jordaan, passed away in February 2012 after a long battle with cancer. Apart from the emotional toll of this loss, there were also implications for the completion of her Doctorate as he was not available to provide feedback during the latter parts of the process. Dr Janina Wozniak stepped in during the last month before submission to assist her in his stead and she was able to complete as planned. It was a growth experience for her, not only academically, but also personally and though it was a challenge she felt that in many ways it has made her a better academic. She also began collaboration with two of her Doctoral students who are also contract staff in

her department, Mr Jakub Siwak and Mr Corné du Plessis. "Together we are researching the use of e-learning in first year journalism courses and intend to complete our initial research during the latter half of this year."

In January of 2012, she presented part of her Doctoral research at the Hawaii International Conference on Arts and the Humanities in Honolulu. She co-published an article with one of her postgraduate students, Ms Carla Zdanow in the *African Sociological Review*, "The Representation of Suicide and Self-Injury on Emo Social Networking Sites."

"It might sound clichéd but for me one of the core enablers was the support of my family and friends. My husband, my mother (who is an academic at NMMU herself) and my daughter (even at just eight years of age) are my most significant support system. They believe in me and help me to believe in myself, which can be a challenge especially when you are starting out in research".

Dr Wright would like to acknowledge the excellent Phuhliisa programme that she was honoured to be a part of. The training, mentorship and funding from the programme helped her to develop as a scholar and to understand the role that research plays in the academic project. Prof Peter Cunningham was her mentor and an invaluable source of insight, advice and support. The article writing workshops that formed part of this programme were directly responsible for the publication of her first article in an accredited journal.

Colleagues within her department have also been supporters of her development as a researcher and have provided inspiration for her in terms of their own research success, in particular she points to Prof Bert Olivier, Prof Andrea Hurst and Dr Janina Wozniak.

Deep-rooted Conflict and Post-Conflict Reconstruction



Dr Lyn Snodgrass

Dr Lyn Snodgrass is involved in research in the conflict resolution field, which is premised on the understanding that conflict is endemic in societies and in this sense conflict is the engine of social evolution in modern societies pushing us onward and provoking us to find new ways of resolving it. In rapidly urbanising and democratising societies, constructive conflict engagement and its resolution is the bridge to sustainable peace and social cohesion. Research undertaken seeks to analyse the causes of deep-rooted, intractable conflict and to investigate strategies for managing destructive conflict processes.

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Masters and Doctoral students, South African and international, are supervised in interdisciplinary research, which falls under the overarching themes of deep-rooted conflict and post-conflict reconstruction with an emphasis on Africa. The important contribution of this research and the need to create an environment that nurtures and retains research talent in the field is recognised.

Research clusters around regional, national and international focus areas investigate international negotiation and mediation, refugee integration, rehabilitation of child soldiers and conflict management systems design. On-going research in the inter-sectoral Helenvale Safety and Peace through Urban Upgrading (SPUU) Programme in Port Elizabeth investigates violence prevention and conflict resolution strategies in marginalised gang-ridden communities. Based on the findings and recommendations of the Pre-Feasibility and Feasibility study the project will be implemented in direct consultation with the community and with the active participation of the Helenvale Stakeholders' Forum and its substructures.

PhD Initiative with the Stellenbosch University

The School of Music, Art and Design (SoMAD) has entered into an arrangement with Stellenbosch University's Graduate School of Arts and Social Sciences wherein the Graduate School is presenting a four-year Doctoral study programme, focused specifically on practice led / practice based research, to a cohort of seven visual arts staff members from NMMU.

This initiative is part of SoMAD's strategy to address the fact that the visual arts terrain has changed over the past number of years, with an increasing emphasis being placed, both nationally and internationally, on the theorising of visual arts practices, through facilitating the growth of our disciplinary research profile, and by seeking to increase our capacity to offer relevant postgraduate programmes.

In order to achieve these goals we identified the need to address the following challenges:

- Increase the proportion of our practice focused academic staff members with a doctoral qualification;
- Increase the proportion of practice focused academic staff members who are research active in the various fields of visual research; and
- Increase the school's postgraduate teaching capacity.

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During 2013, the first year of the programme, the NMMU cohort registered as student affiliates. The year was utilised for doctoral preparation and proposal development. An academic programme was tailored to meet the specific needs and requirements of scholars in the visual arts and PhD developmental workshops were attended during the recess periods in April (Stellenbosch), July (Port Elizabeth), and September (Stellenbosch).

Once the proposal development process is complete the SoMAD cohort will submit their PhD proposals individually to the Stellenbosch Senate for consideration, and once a proposal has been approved, candidates will be able to register for the first year of Doctoral study. It is our aim to see our staff complete the degree within a three to four year registration period as part time students at Stellenbosch.

Units from Journal Articles

Name of Department	Units
Applied Language Studies	2
Journalism, Media Studies and Philosophy	11.75
Language and Literature	5.5
Political and Governmental Studies	12
Sociology and Anthropology	5.33
Applied Design	2
Music	1
Dean's Office	1
TOTAL	40.58



Faculty of Business and Economic Sciences

Managing tomorrow



■ 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



The Faculty has a well established strategic planning process, which serves to guide its research initiatives. Our 2012 strategic plan was built around three primary focus areas, namely building research capacity, embedding the Faculty research themes and facilitating transformation within the domain of research. We have made excellent progress during 2012 with converting our plans into action.

A range of initiatives and interventions were introduced in support of expanding and building the Faculty's research capacity. These initiatives include: providing comprehensive incentive packages for researchers; capacitating the Faculty's research office; building research expertise through training initiatives and facilitating access to specialised statistical support service; facilitating the building of research teams; appointing research associates and research fellows as well as refining the workload system and its implementation.

The two research themes of the Faculty, namely "Local Economic Development" and "Ethics, Governance and African Leadership", are directly linked to the directional statements of the Faculty and provide a logical focus for research development. The Faculty views the embedding of these two research themes as an important strategy to facilitate a more effective use of its limited research resource base. The sharper focus provided by the themes holds 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 themes include financial incentives for theme-related research, guiding student (qualification-directed) research towards the themes, initiating an in-house Faculty journal to stimulate and accommodate publication of research and an audit of current research to assess alignment with the themes.

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The Faculty is committed to transformation as embodied in NMMU's Vision 2020 and this commitment is also reflected in the Faculty's research endeavours. 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. 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. The research outputs of the Faculty across all the different categories are growing and we are convinced that the upward trajectory we are on is sustainable over the medium-term.

The total number of students who graduated with postgraduate qualifications grew by 15% relative to the previous year, our Masters graduates increased by 7% and our Doctoral graduates increased by more than 100%.

While not yet confirmed, we are expecting our publication output to exceed that of previous years while our postgraduate graduations have reached an all-time high. The total number of students who graduated with postgraduate qualifications grew by 15% relative to the previous year, our Masters graduates increased by 7% and our Doctoral graduates increased by more than 100%.

I am extremely proud of the research achievements of the Faculty during the past year and excited about the opportunities and our growing capacity to support continued and even accelerated growth. This unfolding growth trajectory, however, is only possible through the commitment, hard work and excellence of my colleagues.

Prof Niekie Dorfling

Executive Dean: Faculty of Business and Economic Sciences

Faculty Research, Technology and Innovation Chairperson's Overview



Prof Hendrik Lloyd

The Faculty Research, Technology and Innovation Committee (FRTIC) is the vehicle for creating a supportive infrastructure and establishing an enabling environment for researchers within the Faculty. The process of enablement starts with a strategic planning session each year based on a three-year rolling-plan platform. During such a planning session, the Committee deliberates on various strategic issues to develop, nurture and enhance a culture of research in the Faculty. These actions include, but are not limited to, the following:

- Staff capacity and staff capacity development including training and development of novice researchers by means of workshops, mentoring processes and colloquiums;
- Research support, including the facilitation of obtaining ethics clearance on research projects and the establishment of MoUs with a range of research partners and research collaborators;
- Research funding;
- Mechanisms of support to increase Masters and Doctorate supervision and throughput;
- Assistance to postgraduate students, especially at PhD level, to gain external exposure by disseminating the findings of their research; and
- Rewarding staff for research excellence by means of various research awards.

During this past year, the FRTIC provided specific support to staff, including the following:

- Training workshops for new supervisors;
- Workshops to develop competence in scientific article-writing;
- Workshops on the art of presenting papers at a conference;

- Financial support to attend local, national and international conferences; and
- Financial support to cover publication costs of articles in accredited journals.

To enhance the research experience and to acknowledge outstanding contributions to research in the Faculty, awards were presented to staff in three separate categories, namely Faculty Researcher of the Year, Faculty Emerging Researcher of the Year and the Sustainability Research Award. A fourth award category is being planned for next year and will cover the area of interdisciplinary research.

In summary, the FRTIC is a people-centred mechanism established with the aim of increasing the volume and improving the quality of research through the combined efforts of colleagues in the Faculty.

To enhance the research experience and to acknowledge outstanding contributions to research in the Faculty, awards were presented to staff in three separate categories, namely Faculty Researcher of the Year, Emerging Faculty Researcher of the Year and the Sustainability Research Award.

Faculty Researcher of the Year



Prof Shelley Farrington

The focus of Prof Farrington's research is on entrepreneurship and family business. Although she undertook her Doctoral studies on family businesses and has published several articles in the field, she lectures mainly in the area of entrepreneurship. Combining the two fields of study is of most interest

to her. Investigating transgenerational entrepreneurship and the factors influencing this among family businesses is the main focus of her current and future studies. The NMMU Family Business Unit, with Prof Farrington as research coordinator, has recently applied to participate in the global Successful Transgenerational Entrepreneurship Practices (STEP) project. The STEP project aims to understand how successful long lived family firms ignite entrepreneurial thought and action across generations. 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 and involve investigating entrepreneurial orientation and the resource-based view within the context of family businesses, amongst others.

During 2012, Prof Farrington published an article, based on her Doctoral studies, in the *Family Business Review*, an A rated international journal with an impact factor of 2.6, and together with co-authors awarded the best research paper at the Annual Conference of the Southern African Institute for Management Sciences. She was also the Faculty of Business and Economic Sciences Researcher of the Year for both 2011 and 2012.

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 idea to output”.

Faculty Emerging Researcher of the Year



Dr Deborah Lee

Dr Deborah Lee's primary research areas include non-market valuations of environmental and natural resources. The non-market valuation techniques she specialises in include the contingent valuation method, the choice experiment method and the travel cost method. Her Doctorate involved two choice experiment applications in order to value recreational services provided by the Sundays River and Kromme River Estuaries. This research has allowed her to branch out into other natural resource conservation areas.

One of her current projects involves the development of management

strategies for the protection of South Africa's rhino population. Apart from the completion of her Doctorate in 2012, entitled "An application of the choice experiment method to estimate willingness to pay for and guide management on estuarine recreational services", she successfully supervised a Masters candidate in Natural Resource Economics.

She co-authored a paper in a DHET accredited journal, namely the *Journal of Economic and Financial Sciences (JEFS)*. Conference presentations include a paper delivered at the South African Institute of Management Scientists (SAIMS) conference in Stellenbosch and a paper delivered at the South African Statistics Association (SASA) conference in Port Elizabeth. Both of these papers were published in the respective accredited conference proceedings for 2012.

Organisational Behaviour



Prof Eileen Mazibuko

Prof Eileen Mazibuko's area of interest is organisational behaviour, with specific reference to organisational commitment; organisational performance; and employee participation. The second big field is services and international marketing, branding and consumer behaviour. She promoted four PhD's and one DBA as well as two MCom students – who graduated in 2013.

Prof Mazibuko motivates staff to work together - and encourages them to work in teams. As they focus on the key areas of teaching and learning, research and community engagement. She believes that staff can benefit from research collaboration through team spirit. However, the team must be restricted not to exceed three people. This view of restricted teams emanates from the fact that when the teams are too big, "not much learning takes place and others will not benefit in terms of research output".

Past experience has taught her to be mindful and sensitive to the mentor-mentee context for the purpose of research output. If this is not properly managed, the mentee might not participate sufficiently in sharing the responsibility or might not receive the deserved recognition for his/her contribution. "It is important to develop plans and a career map to stay focused in developing yourself and achieving your goals". Her mission now is empowering others and sometimes lead from behind. She helps her colleagues to build their confidence as research team leaders.

Prof Mazibuko states that: "research collaboration is great as researchers and postgraduate supervisors – but colleagues must show confidence by learning how to take a lead as principal investigators, to be able to do this, you need to know your research field". She further adds that listening is important as well as having an open mindset. Believe in yourself as well as it is important to keep to your deadlines and sacrifice your time to achieve set goals. Make means for the postgraduate students to study, for instance, assist, encourage and lead them towards the right direction to get sponsorship or provide them with relevant information. Keep progress reports of each postgraduate student".

Sustainability Management



Prof Elroy Smith

Prof Elroy Smith's research areas are strategic management, ethics, social responsibility and sustainability. He focuses on the triple bottom line: profitability, environment and social responsibility. In 2012, he was chosen as the "Faculty Sustainability (Green) Researcher of the Year". He presented papers in Italy, Kenya and Uganda, focusing on corporate social responsibility and small, medium, micro enterprises (SMME's). He also delivered a paper at the South African Institute for Management Scientists (SAIMS) Conference at Stellenbosch University exploring the issue of greening in manufacturing firms. He produced a number of articles, which were published in a variety of refereed journals.

Prof Smith attributes his success to a culture of research in the Department of Business Management – arguably one of the departments with the highest research outputs in the Faculty of Business and Economic Sciences. There is a high team spirit, and colleagues in the department bounce ideas off and advise one another accordingly. Prof Smith warns that unless "one makes time for research", one would never get to it. He works after hours and over weekends to ensure that he gets to his research. All seven values of the NMMU influence his thinking and his research. To would-be researchers, over and above making time, he says "make sure you attend conferences, nationally and internationally, and network with other researchers."

Stakeholder Management



Dr Chantal Rootman

Dr Chantal Rootman's fields of interest are finance and marketing and most of her research outputs are in the banking industry and financial planning. She views marketing from the vantage point of relationship management. In 2012, she contributed to a textbook, promoted two Masters students, one on marketing and the other on social corporate responsibility. She delivered three conference papers. One paper was delivered at Budapest, Hungary, with regards to money attitudes among university students. Dr Rootman's enablers are that she has been able to generate her own funds through publishing articles. She states that staff in the department are also key enablers. They bounce ideas off one another. "It is important to share your research ideas before going on with your research". It is also empowering to work in diverse teams, "young/old, male/female." Dr Rootman collaborates with Dr Janine Kruger and Prof Miemie Struwig. Prof Eileen Mazibuko appointed her to mentor younger colleagues (Associate Lecturers) cultivating an academic ethic in them. Different perspectives are brought to bear on what is being studied. This brings about multi-perspectives. She works nationally with the University of Johannesburg, UNISA and MONASH University. She believes it is important to build a global network- "this can help in sourcing examiners for your Masters and Doctoral students".

Multi-Disciplinary Business Research

Prof Miemie Struwig is primarily a research methodologist, who is prolific and accomplished, and works across disciplines such as construction (green buildings at NMMU under sustainability). Her main achievements include publishing a textbook on Research Methodology, with Prof Graham Stead, who now lives in the USA. Prof Struwig has collaborators in Germany and Mauritius. She is driven by all the values of NMMU, but in the main Ubuntu, excellence and respect for the natural environment. She describes herself as a person who empowers others. Due to the fact that she publishes extensively – she is able to generate funding – and such funding becomes an enabler to her. Up to 2012, Prof Struwig has supervised twelve Doctoral students and fifteen Masters students to completion.



Prof Miemie Struwig

The sage advice given by Prof Struwig for would be researchers is:

- It is important "to take the first step and start";
- Believe in yourself;
- Taking the first step is absolutely important; and
- Focus, focus, focus – do not be all over the place.

Prof Struwig is such a brilliant and prolific researcher – that she is worthy of emulation by all.

Emerging Consumer Markets



Prof Steve Burgess

Prof Steve Burgess is Director of the Nelson Mandela Metropolitan University Business School and Professor of Marketing. He was the Research Director and Professor of Business Administration in Marketing in the Graduate School of Business at the University of Cape Town and the Association of Marketers Professor of Marketing at the University of the Witwatersrand. Prof Burgess's research concerns consumers and organisations in emerging consumer markets (ECMs), a term that he introduced into the literature, and low-income countries (LIC's). ECM's and LIC's differ substantially from the industrialised West, where most theories that influence our thinking about business and management originate. These differences include substantial departures in the institutional context (socio-economic, cultural, regulative) of these countries, which is more dynamic and complex. Prof Burgess's research essentially attempts to understand the generalisations and boundary conditions of theories in the ECM/LIC institutional context. It focuses primarily

on stakeholders, especially consumers, appropriate strategic responses to them and the implications for strategic, financial and organisational performance. It encompasses two broad but related streams namely consumer behaviour and market orientation and market-oriented behaviours.

- Consumer behaviour. Consumer behaviour within the rapidly changing ECM/LIC context. Values, personality traits (optimum stimulation level), social axioms, monetary attitudes and other personal differences at the individual level. National culture (social values, social axioms) at the group level. Interpersonal and intergroup perceptions and relations (social identity). This research seeks to find more stable aspects of individuals and societies as an aid in market planning (i.e., market segmentation, brand positioning and management, integrated marketing communications). The research also focuses on the effects that consumers have on government and other stakeholders that affect the firm (stakeholder influence).
- Market orientation and market-oriented behaviours. Market orientation, its antecedents (top management attitudes and behaviour, organisational structure and processes, learning systems) and consequences (strategic and financial performance, innovation, employee attitudes and behaviours and customer perceptions and behaviours). Research includes commercial and non-profit firms, in the domestic and export marketing contexts.

Units from Journal Articles

Name of Department	Units
Accounting Sciences	1
Business Management	10.942
Economics	8.663
Development Studies	5.167
Business School	4.83
TOTAL	30.602

UNITS

Unit for Economic Development and Tourism

Leader: Prof R Haines

As part of its mission and vision, which is to conduct relevant research and training to accelerate sustainable economic development in the Eastern Cape, South Africa and the African Continent, the Unit for Economic Development and Tourism (UEDT) 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 three significant local and regional economic development ventures, namely the Eastern Cape Local Economic Development Education Forum; the Higher Education Institutions (HEI) Local Economic Consortium; and the Nelson Mandela Bay Maritime Industry Cluster. The research publications generated during 2012 were: two research peer-reviewed

articles, five national conference papers were presented, two book chapters were generated, ten Masters degrees were completed by coursework and two by research and four Doctoral degrees were awarded.

Unit for Applied Management Sciences

Leader: Prof EE Smith

The Unit for Applied Management Sciences (UAMS) had a successful 2012 by contributing to its mission of developing 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. Members of the Unit had the following research outputs in 2012: forty-two international and national conference papers; 19 journal articles; eight books and book chapters; 19 Masters and Doctoral degrees completed; 29 BCom/BTech treatises completed and eight other publications in 2012. Members received various research-related awards and grants during the period under review.

Family Business Unit

Leader: Prof E Venter

The establishment of a Family Business Unit, whose mission it is to be the leading Family Business Unit in Africa through academic excellence, practical relevance, and the development and dissemination of knowledge and expertise in the field of family businesses takes time because of the nature of family businesses. The focus of the Unit, now in its second year has been on building a reputation in the specific field through research outputs, supervision and engagement with family businesses and people who work in this field professionally. From a zero base, the Unit has managed to establish a database of 500 family businesses, deliver on its commitment to research and trained 12 Family Business Consultants in the past year. Six journal articles were published in accredited journals, three international conference papers and two national conference papers were delivered. One Masters student graduated.

Labour Relations and Human Resources Unit

Leader: Prof DM Berry

The Labour Relations and Human Resources Unit (LRHRU) enhanced its pursuit in fulfilling its mission, which is to serve the community by developing people through education, training and research as well as promote effective engagement between organised labour, employers and other interest groupings, in their efforts to achieve a just and successful political economy in Southern Africa. A strategic decision to increase its research outputs via improving the academic qualifications of its staff through Masters and Doctoral degree studies and to increase the number of Masters and Doctoral degree candidates was enhanced during the period under review. This has led to four Doctorates and two Masters degrees being awarded in the past two years with six staff members still currently engaged in Doctoral and Masters degree studies. Two peer-reviewed papers have been accepted for publication in 2013 and four articles are under review. Five international conference papers and two national conference papers were presented. Various community and institutional engagements activities were undertaken as well as formal and non-formal teaching programmes outside the institution were provided, which continued to ensure that the profile of the Unit, School and Institution was enhanced.



Faculty of Education

Guiding tomorrow



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

| Dean's Overview



The Faculty of Education has seen a steady growth in its research portfolio over the past few years. Around 2009-2010, noticing the “aging” profile of senior researchers in the Faculty, we took a strategic decision to focus more attention on academic staff at the “mid-levels” in the Academy.

Often we look only at the outputs that come at the end of a process of prolonged engagement as evidence of research growth, but it is important to note the significant building blocks and the conducive environment that has been put in place to enable those outputs.

Given the context of the merger between a technikon and university, as well as the previous incorporation of teacher training colleges into the Faculty, a predominant focus in the Faculty had been teacher training with only a few senior researchers producing the majority of research outputs. It required a major shift to change this focus on mainly teaching and learning, with research being seen as the domain of a few of the more senior academics. In the light of this, determined efforts took place to support the development of emerging researchers. There was an initial dip in outputs in 2010-11, as some senior researchers retired and some took over more teaching responsibilities to enable emerging researchers to take up research and support opportunities. Since then there has been a remarkable flourishing of research activity that has enlivened the Faculty on many fronts.

Often we look only at the outputs that come at the end of a process of prolonged engagement as evidence of research growth, but it is important to note the significant building blocks and the conducive environment that has been put in place to enable those outputs. In 2012, five writing retreats were held for staff and doctoral candidates and graduates, at various stages of their development as scholars. Various engagements in projects and with communities of practice took place; the establishment of new units, entities and structures (for example Hubs in our Faculty) that both support and serve as initiators and incubators of new research ideas have been a vibrant part of faculty research life over the past years. Of course, the concerted institutional support offered by the University's research division, in the form of workshops and training of novice researchers and supervisors, and a host of research

grants and opportunities have done its share of the magic – these include support to pursue work on specific research themes in the institution, teaching replacement grants, and equity grants encouraging research activity for under-represented targeted groups in the Academy. In addition, at both Faculty and University level, stimulation and inspiration has also been provided through regular seminar series featuring our own faculty, institutional, national and international scholars. All of this has resulted in record research outputs, which we detail in the next few paragraphs.

A highlight of 2012 was the prolific output of our Research Chair in HIV and AIDS Education and Researcher of the Year, Prof Naydene de Lange, who authored and co-authored eight research articles in accredited journals, three chapters in books, was co-editor of a book, and guest edited and wrote editorials in four journals. These publications had a variety of interesting titles such as “Was it something she wore? Gender-based violence and the policing of girls” place in the school space, “Voices of women teachers about gender inequalities and gender-based violence in rural South Africa”, and “Voices of women teachers about gender inequalities and gender-based violence in rural South Africa.”

In addition, at both Faculty and University level, stimulation and inspiration has also been provided through regular seminar series featuring our own faculty, institutional, national and international scholars. All of this has resulted in record research outputs, which we detail in the next few paragraphs.

Another highlight was the work produced by Dr Mathabo Khau, a postdoctoral scholar under the guidance of Prof de Lange, which included seven articles in accredited journals (two of which were co-authored with Prof de Lange) and a book chapter. Her articles were on intriguing topics such as “Gender and the politics of the Basotho blanket” and “Female sexual pleasure and autonomy: What has inner labia elongation got to do with it?” Prof Dalene Swanson produced a journal article and three book chapters with equally intriguing and enigmatic titles such as “The Owl Spreads its Wings: Global and International Education within the Local from Critical Perspectives” and “Refusal as a democratic catalyst for mathematics education development”.

Other NMMU academic staff members who completed their doctoral

research studies in 2012 via the Faculty of Education were Dr Vukile Tshazibana in our Faculty, and Dr Shirley-Anne Boschmans from the Pharmacy Department, several from schools in the region and the African continent. A total of ten doctoral candidates completed their studies in 2012 (for graduation in 2013) – this has been the highest doctoral output in the faculty over the past five years.

Prof Paul Webb wrote seven papers during the year, three of which he was co-author with Dr Andre du Plessis, who was selected as the Emerging Researcher in 2012 based on his work in 2011. Dr du Plessis’ work focuses on the development of IT in schools and has resulted in a helpful heuristic for ICT teacher professional development. Prof Webb’s work on “Xhosa indigenous knowledge: Stakeholder awareness, value and choice” appeared in the online version of the *International Journal of Science and Mathematics Education* and in print in 2013.

Dr Lyn Webb authored two articles in accredited journals, one on professional development in Mathematical Literacy and the other on the impact of language when teaching mathematics. Professors Sylvan Blignaut and Johanna Geldenhuys produced articles on “Obtaining informed consent in non-Western contexts: Reflections on fieldwork experiences in Zimbabwe” and “Youth Envisioning Safe Schools: A participatory video approach” (co-authored with Prof de Lange). Dr Les Meiring wrote an article on “The effect of toys as educative material on pre-service education students: Understanding of energy” and out of the work of a special Humanising Pedagogy Hub, which was initiated by a Fulbright Scholar Dr Carol Rodgers and myself in 2011, came our co-authored article, “A humanising pedagogy: Getting beneath the rhetoric” which was published in the journal *Perspectives in Education* in December 2012.

An exciting and promising development has started to emerge from the engagement work being done by the Faculty’s Centre for the Community School (CCS). It is taking up the challenge to not only be engaged in the work of establishing and building the model and practices of the community school for “Improving Schools and Strengthening Communities”. It has also begun to develop writing and scholarship around its work and findings as it proceeds. The CCS, together with its partner schools in the Manyano Network, have established a “Community Scholars Writing Circle”, which includes members of the community schools, together with academics who are active in its work. Several of the members have enrolled in postgraduate student studies in Masters and Doctoral programmes, and we look forward to moving the research frontiers even further as we do engaged research, that feeds into excellent teaching and learning, and establishing firmly the culture of inquiry in the Faculty and University.

Prof Denise Zinn
Executive Dean: Faculty of Education

Faculty Researcher of the Year



Prof Naydene de Lange

The 2012 Faculty Researcher of the Year, Prof Naydene de Lange, is the Chair of HIV and AIDS Education and heads up the Unit for Visual Methodologies for Social Change. In her work she argues that social science research should be “democratised” to bring researchers and their research closer to the communities they serve. This she draws on visual participatory methodologies, which allow her to do research not “on” but “with” the communities she works with, so that together they can take up their responsibility to bring about positive social change. Her research also responds to the new Charter for Humanities and Social Sciences (2011), which also calls for “researchers in the social sciences and the humanities to take their place again at the leading edge of our struggle for transformation and development of South African society.”

In her work she argues that social science research should be “democratised” to bring researchers and their research closer to the communities they serve.

“Research must play a leading role in helping our people understand and tackle the scourges of poverty, unemployment, racism, discrimination of all kinds and HIV and AIDS”. She thus continues to position her HIV and AIDS education research as social change and continues to shift the boundaries of what counts as modes of inquiry, representation and dissemination.

A particular example of visual participatory research is the *Digital voices of rural teachers: participatory analysis, “being a teacher in the age of AIDS”* and social action project, where she - in collaboration with Prof Mitchell and Prof Moletsane - explores what difference the participation of rural teachers can make to deepening an understanding of youth sexuality and HIV and AIDS, and how these meanings can be translated into more nuanced understanding and treatment of critical social issues in community based programmes and policy. Here they worked with rural teachers, getting them to make cellphlms to understand their thinking about youth and risk, but also to get them to “speak back” to their own work, shifting and changing their own often moralistic and didactic thinking about youth sexuality and risk.

A highlight of 2012 was the launch of the co-edited (with Milne and Mitchell) *Handbook of Participatory Video*, at the International Sociology Association, Forum of Sociology, Buenos Aires, 30 July - 4 August 2012, where many of the contributors were present.

Faculty Emerging Researcher of the Year



Dr André du Plessis

Dr André du Plessis’s research interests are conflict management, ICT implementation and integration in education and social media for teaching and learning. He assists primarily disadvantaged schools and has developed a heuristic for ICT implementation, as well as the C2RHOAR3FS2R2 framework for professional teacher development. His ICT project in disadvantaged schools has received funding from the Hermann Ohlthaver Trust and his engagement with participating schools has resulted in research papers being published in several national and international accredited academic journals on ICT related aspects. In 2012, he was awarded the NMMU Emerging Engagement Award for the best emerging engagement project, as well as the NMMU Emerging Researcher of the Year within the Faculty of Education. His first MEd student graduated in 2013, cum laude. He delivers ICT related papers and presentations at academic conferences and is invited to present

at schools, local conferences and international conferences regularly on ICT in education related aspects. Currently, he is busy investigating the probability of converting DVD's based on the Khan Academy Mathematics and Science portal so that they can be played on any DVD player in order to assist learners who do not have access to the internet to view this content offline. He also uses the Apple iPad extensively while teaching and produces videos of his lectures for his students that they can view afterwards. Using the iPad for teaching and learning as well as educational student created videos are one of his new research avenues, including the use of iPads in schools.

He also serves on the executive of the International Organisation of Science and Technology Education (IOSTE) and is co-editor in chief of the newly established online journal, *Educational Research for Social Change (ERSC)*.

Gender and Sexualities



Dr Mathabo Khau

Dr Mathabo Khau's research interests are on the confluence of gender, sexualities and HIV and AIDS in Education. In the main she is interested in how the personal identity of female teachers in Lesotho clashes with their professional self. Notwithstanding the fact that female teachers are professionals, who are highly qualified, and should be able to teach sexuality education with ease.

Yet, because of their gender, and the fact that sex education is still being treated as taboo among the Basotho, they find themselves in an invidious position. They are qualified to teach, yet constrained by their gender, females in Lesotho find themselves under perpetual subjugation and imparting sex education to the Basotho children in the schools, therefore, becomes a formidable and complex challenge.

Through educating the female teachers, Dr Khau seeks to change the status quo in Lesotho. HIV and AIDS infections are negatively skewed towards girls in Lesotho. The research has taken Dr Khau to every nook and cranny of Lesotho, where she is working with the female teachers "not as an outsider looking in, but indeed as participant observer – one of their own". She also works at changing the attitudes of Basotho males.

She believes in the values of excellence, and integrity, and is a firm adherent to the view that research should make a difference and bring about social change.

Intergenerational discussions have begun taking place as a result of her research. Dr Khau has benefitted from the time she had as a postdoctoral fellow to devote attention to her research. She has also received considerable support from colleagues. She observes that "research is an emotional journey", and without support, it can be an uphill battle.

She has collaborators at the Universities of Linköping and Örebro in Sweden, where there is a gender excellence institute. She believes in the values of excellence, and integrity, and is a firm adherent to the view that research should make a difference and bring about social change. To aspirant researchers her advice is "have passion and intrinsic motivation".

Folktales and Resilience



Dr Nokhanyo Mayaba

Dr Nokhanyo Mayaba works primarily in language across the curriculum research area, and her PhD project was on folktales. Her study was informed by literature, which reports on the recent increase in the number of children orphaned and rendered vulnerable by HIV and AIDS in South Africa, which has placed an added burden on schools as sites of care and support. Teachers have regarded their pastoral role as an added responsibility that they do not feel competent to execute. In order to address this problem she adopted

an action research design to explore the potential of folktales to enhance resilience in children orphaned and rendered vulnerable by HIV and AIDS in a way that could be easily integrated into the academic curriculum. Using folktales was driven by literature on bibliotherapy and current literature on how cultural variables can contribute to the process of resilience.

In the first cycle of the action research study she showed how merely telling cultural stories to children could produce resilience enhancing outcomes. In the second cycle she focused on how such stories could be used in a more interactive way, in keeping with classroom pedagogical requirements. She used the resilience framework as a theoretical construct in order to explain the resilience enhancing potential of folktales. She 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.

Scientific Literacy



Prof Paul Webb

Prof Paul Webb's research has focused on the promotion of scientific literacy via inquiry-based classroom discussion, argumentation and writing in science education. His studies have been conducted in a variety school, university and non-formal settings, and the contexts have included science, mathematics and environmental education, science education in museums, technology-based approaches, and comparisons of Swedish and South African students' responses to a scientific literacy approach.

Overall, these studies have revealed a statistically significant improvement in problem-solving abilities in response to exploratory talk and argumentation, as well as in writing ability. However, they also suggest a caveat, that careful facilitation by teachers is needed to produce authentic inquiry-based discussion, not only to prevent the cementing of misconceptions, both common and idiosyncratic, but to provide opportunities for creative thinking.

The perspectives provided by these studies have highlighted not only political imperatives implied by differing worldviews, but also the mutually supportive roles that these fields of knowledge can play in the education process.

Research into a wide variety of stakeholder's awareness, value and choice in terms of indigenous knowledge, coupled with theoretical understandings of the nature of science, have resulted in papers, book chapters and keynote addresses on the tensions between science, technology and indigenous knowledge. The perspectives provided by these studies have highlighted not only political imperatives implied by differing worldviews, but also the mutually supportive roles that these fields of knowledge can play in the education process.

Prof Webb's research has been supported financially by incentive and international collaborative grants from the NRF, through the cooperation of his colleagues at the NMMU and internationally, and the goodwill of educators in schools and tertiary institutions both in South Africa and abroad.

Units from Journal Articles

Name of Department	Units
School for Initial Teacher Education	0.33
School for Continuing Professional Development	1.7
School for Education Research and Engagement	14.16
Dean's Office	1
TOTAL	17.19

UNIT

The Unit for Visual Methodologies for Social Change

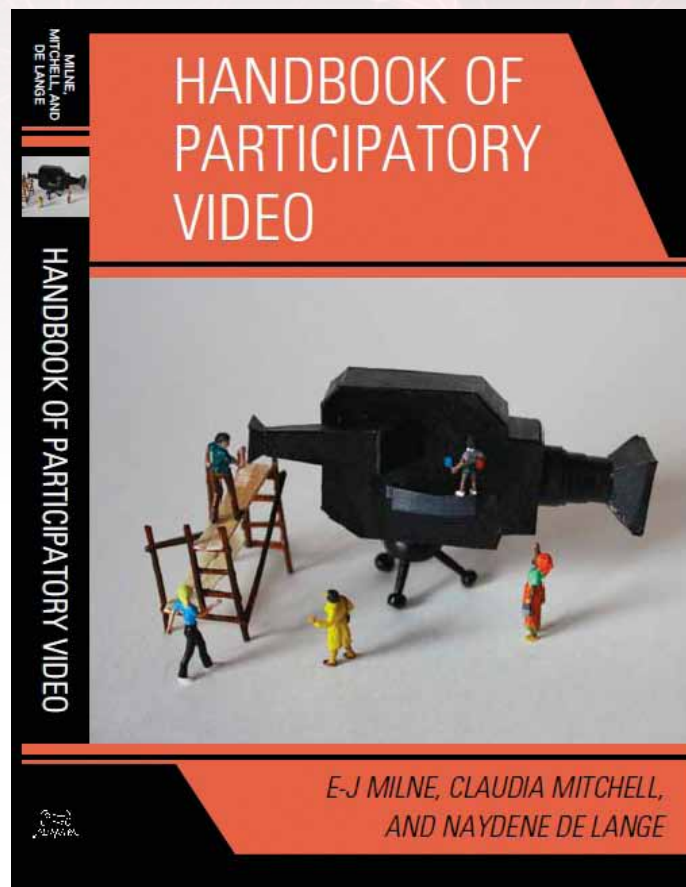
Leader: Prof N de Lange

The Unit for Visual Methodologies for Social Change (VMSCU) continues in its pursuit to advance the study of visual and participatory methodologies (photovoice, participatory video, digital archives, performance in community-based work) 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. The outcomes and accomplishments of 2012, the second full year of the Unit, provide a firm base for extending the use of innovative research methodologies to more researchers and also to other disciplines and contexts. Seven journal articles were published, three international and three national conferences were attended. Two books were published.



Editors Prof Claudia Mitchell (Canada), Dr E-J Milne (UK) and Prof Naydene de Lange (SA) at the book launch at The International Sociology Association, Forum of Sociology, in Buenos Aires



Handbook of Participatory Video

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



The following significant research highlights and achievements mark 2012 as a year of celebration for the Faculty of Engineering, the Built Environment and Information Technology. The number of rated researchers in the Faculty increased to twelve in total, with two staff members, Prof Darelle van Greunen and Dr Kerry-Lynn Botha, having successfully applied for a NRF rating.

The Faculty has numerous partnerships with industry and actively participates in productive international research collaborations as part of a strong focus on applied research programmes.

Two of the Faculty's senior researchers, Prof Danie Hattingh and Prof John Smallwood, were successfully re-rated during the year. Further, during 2012 a record number of thirteen PhD candidates graduated, six in the School of ICT, four in the School of Built Environment and three in the School of Engineering. Significant progress has also been made in our research entities as evidenced by the number of publications and postgraduate students.

The Faculty has numerous partnerships with industry and actively participates in productive international research collaborations as part of a strong focus on applied research programmes. It is our belief that greater emphasis on advanced technological research can address many of the current problems experienced in our environment, social development, and standard of living.

The innovation through energy with eNtsa, a leading research, design and technology support centre for the manufacturing industry is cited as one of only two world-class technology stations in South Africa. One of their current projects is an R11 million contract from Eskom, which will save the energy giant millions of rands. The eNtsa team also won the 2012 Eskom Chairman's award for Innovation with their research partners from Eskom. The engineering team received this award in recognition of their efforts and work conducted on the Hendrina Turbine project, implementing the NMMU developed WeldCore® technology.

The School of Engineering has taken a bold step towards “Green Power” and is busy experimenting with and researching renewable energy sources. This is truly visible with the installation of various renewable energy harvesting systems on the roof of their North Campus building. NMMU understands the dire need to move away from fossil fuel derived energy sources to renewable sources and the School of Engineering is actively contributing towards this goal.

***The innovation through energy
with eNtsa, a leading research,
design and technology support centre
for the manufacturing industry is cited
as one of only two world-class
technology stations in South Africa.***

With the financial support of Volkswagen South Africa, the VWSA-DAAD Chair and the NMMU’s Advanced Mechatronic Technology Centre (AMTC), NMMU engineering students were able to successfully design and build their very first solar car. The NMMU - cidb Centre of Excellence is hosted by the Built Environment Research Centre (BERC) and is a hub dedicated to construction industry development related research.

Against the background of a growing concern among internet banking clients that their money may not be safe due to the spate of internet banking and SIM-swap fraud costing clients thousands, the School of ICT has patented a solution to curb fraudulent internet banking transactions.

NMMU has established Nelson Mandela Bay’s first “living lab” in Motherwell. Both the Emmanuel Haven for children affected and infected by HIV and AIDS in the township and students from NMMU will greatly benefit from the innovative initiative to bring research, knowledge and caring together in one environment.

The Ford Motor Company SA (FMCSA) launched the Engine Research Unit on 4 June 2012. The Unit is located at the thermodynamics laboratory of the Mechanical Engineering Department. The research unit focuses primarily on research and development, education and training, as well as dedicated industry projects inclusive of synthetic fuels.

All the staff in the Faculty need to be acknowledged for their dedication, hard work and commitment to their research activities and studies towards

achieving these research successes and taking the Faculty forward. Finally, the Faculty extends its appreciation to top management at the NMMU Research Departments for their support and leadership.

Prof Rossouw von Solms

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

Faculty Researcher of the Year



Prof John Smallwood

Prof John 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 2012 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" study. 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.

Faculty Emerging Researcher of the Year



Dr Brink Botha

Dr Brink Botha completed his PhD degree in 2012, graduating in 2013 after successfully completing his MSc degree in the Built Environment as well as two Baccalaureus degrees cum laude and a National Diploma in Building cum laude. During this period, he achieved 29 module distinctions, twenty one academic excellence awards and two industry awards whilst being actively involved in teaching and learning subject development and facilitating of more than twenty academic modules at graduate and postgraduate level. Whilst completing his PhD, he was actively involved in teaching and learning, and successfully supervised an MSc Built Environment research study, five BSc Honours research studies, published two journal papers, attended conferences and delivered four papers whilst being actively involved in industry.

The primary focus of his research and extensive industry exposure and contribution is on real estate and property development, which is also his interest and passion supported by serving on the Eastern Cape Council of the South African Property Owners Association (SAPOA). Dr Botha's PhD study produced ground-breaking research in developing a business process model for perceived success of property development projects that did not exist before. Dr Botha is professionally registered as a Construction Project Manager (Pr. CPM) and an incorporate of the Chartered Institute of Building. He is currently extensively involved in teaching and learning, various research projects, multiple research supervision and further community service and publishing. He is furthermore developing a new academic programme within his department amongst contributing to other managerial activities in his capacity as acting Head of Department.

Information Security and Privacy



Prof Reinhardt A Botha

Prof Reinhardt A Botha works in the area of Information Security. In security he deals with confidentiality, data integrity, authenticity and access control. His research interests also extend into mathematics - through creating a platform to tutor mathematics over the cell phone. He is additionally involved with privacy issues in technology, and spent a month in Germany doing research.

A key achievement in the year under review is a student who attained a PhD, with a thesis on the "Dr Math platform". Over 50 000 students were assisted using this technology, an innovative way for finding and disseminating solutions to mathematical problems.

The research friendly environment in the School of ICT was enabling – so too were other factors such as sabbatical leave – and the fact that research in his area does not require astronomical figures when it comes to rands and cents. Research in the ICT environment does not cost exorbitant amounts. In his own words "this is a relatively scalable environment".

Values of NMMU that guided his efforts are integrity and excellence. He works externally with Goethe University, Frankfurt, as well as Plymouth University. Challenges for him have been around the fact that people are not always willing to share information. Gathering data is also challenging, due to the sensitivity of the information.

Research for him is about "making a real difference". Solving real problems and providing real solutions, which contribute to the improved lives of people, are helpful energisers for what he does.

Growth as a researcher takes place through reading papers, attending conferences, and meeting like-minded people all over the globe – who show interest in similar work- as he does, have kept his appetite for research on the high.

Solutions for the future through Research and Engineering Innovation



Prof Danie Hattingh

Prof Danie Hattingh states that the different research areas of friction processing explored by eNtsa engineers in collaboration with researchers of the Friction Processing Research Unit (FPRU) at the NMMU are focused on Friction Stir Welding (FSW) and Friction Hydro Pillar Processing. The common feature of friction processes is that the material used is processed in the solid state (i.e. below the melting point of the material) to produce a high quality joint or repair. These processes are of major interest for applications where the original material characteristics are required to remain unchanged as far as possible.

During 2012, eNtsa and FPRU have completed a number of industry supported academic research studies with a significant knowledge impact. This assisted our industry partners to make informed decisions about the suitability of implementing new manufacturing or repair strategies within their operating environment. The highlight of this collaboration was the completion of a PhD student's study in which a creep sample retrieval technique and a repair procedure by friction hydro pillar welding was developed. This study formed the knowledge base for the NMMU developed Weldcore® process, which has now been successfully implemented as part of a life extension procedure of high valued engineering components in South Africa with substantial financial benefit to the South African economy. It also resulted in the NMMU being awarded the ESKOM Chairman's Award for Innovation in 2012.

"We are a solution driven group that prefers to work closely with our international and industry research partners".

Research in Prof Hattingh's group is driven with strong focus on innovation and economic value proposition to the South African engineering industry. "We are a solution driven group that prefers to work closely with our international and industry research partners". Our success can be contributed to three main considerations, sufficient funding, academic achieving and enthusiastic postgraduate students and an active involvement from a professional engineering support team, industry and international roll players. In short, I believe we have to work with the best in the world, be guided/critiqued by the best if we want to become the best.

Units from Journal Articles

Name of Department	Units
Industrial Engineering	0.5
Mechanical Engineering	2.85
Mechatronics	1.83
Construction Management	4
Quantity Surveying	1
School of Information and Communication Technology	1.993
Information Technology	4.504
Applied Informatics	0.833
TOTAL	17.51

UNITS

Research and Outreach Unit for Technology Education

Leader: Dr H Lombard



The mission of the Research and Outreach Unit for Technology Education (ROUTE) is to be actively engaged and promote scholarship in teaching and learning in order to advance technology education within the internal and external community, both nationally and internationally. Some exciting projects during 2012 included the HEDS-TL Pilot Project (this is a Collaborative project established in 2009 between Higher Education Access and Development Services (HEADS); Faculty of Engineering, the Built Environment and Information Technology (EBEIT); in particular the School of Engineering (SoE) and the Department of Applied Language Studies (DALs).

The HEDS-TL Pilot Project addresses the language, reading and writing skills of students. Another project was the Mentorship Programme in the School of Engineering, where retired engineers continue to mentor senior students and first-year students. The preliminary results obtained from this project are very promising. The mentoring programme will stimulate research in the fields of teaching and learning and the success of the programme will to a large extent be influenced by action research and the active incorporation of feedback and regular improvements.

Blended Learning and Curriculum Design were two other major projects that ran during 2012. The Wela Project has expanded significantly and a Short Learning Programme has been developed in 2012 and is envisaged to be implemented in 2013. The mentoring programme continues to contribute in providing a supportive and affirming environment that enables students to reach their full potential. Two journal articles were published; one national paper and two international conference papers were delivered.

Unit for Lean Process Development

Leader: Dr K van der Merwe



Delegates from Western Cape Furniture Initiative with Dr Karl van der Merwe on the right

The Unit for Lean Process Development's (ULPD) mission is to actively engage in research and community service activities, which focuses on educational knowledge and skills to enhance the competitive advantage of the South African business and academic community through the implementation of the Lean Process Philosophy. In 2012, ULPD secured the registration of three new Doctorate and three Masters students that would assist in the Unit pursuing its mission.

Some of the research output highlights in 2012 include the conferring of three Doctoral degrees to researchers within the Unit and one journal article was accepted for publication in the *SA Journal of Industrial Engineering*.

A Lean presentation was also accepted for the 42nd Annual Computers and Industrial Engineering Conference. A number of training workshops were held to assist local industry with Lean improvement initiatives. In addition, the Unit conducts research aimed at developing Lean manufacturing frameworks for Denel Aviation in its quest to set-up a facility to manufacture a South African regional light aircraft.

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



The Faculty of Health Sciences has had a most productive 2012 in respect of research. Thirty candidates completed Masters or Doctoral studies during the year. The thirty graduates included four staff members who received Doctoral degrees and three staff members who received their Masters degrees. An additional six staff members received degrees or diplomas through other faculties or institutions during the same period. This indicates the commitment of the staff to sustained life-long learning in order to provide a service to both the wider community and to the students enrolled in the Faculty.

The staff have also been most productive in publishing articles and writing chapters in textbooks with 28 articles published in refereed, DHET accredited journals and other research journals. Twelve book chapters written by staff members were published during 2012. Prof MB Watson, the Faculty's Researcher of the Year, published no less than six chapters in 2012, in collaboration with Prof Mary McMahon of Australia.

The Faculty has, through its staff and students, developed an excellent profile at national and international conferences. Twenty podium presentations and 24 poster presentations were made. Of these presentations, seven were international podium presentations and thirteen 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.

The Faculty held a successful Prestigious Student Research Conference in October 2012 where students presented nine podium papers and five posters.

It is not only the staff who have been involved in highlighting their research. The Faculty held a successful Prestigious Student Research Conference in October 2012 where students presented nine podium papers and five posters. In addition to this conference, the Faculty's students also contributed five papers at national and international conferences from which they returned with a gold medal and a runner-up award for the best podium presentation.

One student, Mr K Daniell, received the Erasmus Mundus Action 2 scholarship to attend the Karolinska Institute in Sweden from December 2012 to June 2013. He is using this opportunity to make significant progress with his MSc degree in Pharmacy. We expect great results from him following this international exposure.

We believe that research is important for both the generation of new knowledge and for the purposes of informing our teaching and learning. We continue to strive for research excellence and are confident that 2013 will build on the success of 2012.

Prof Victor Exner

Executive Dean: Faculty of Health Sciences

Faculty Researcher of the Year



Prof Ilse Truter

Healthcare management is becoming increasingly complex in a changing society. It is therefore of the utmost importance to ensure the optimal management of scarce healthcare resources. This is what NMMU's Drug Utilisation Research Unit (DURU) under the leadership of Prof Ilse Truter aims to do. Prof Truter's research interest is the central nervous system, and current projects focus on depression, migraine and headache, Attention-Deficit/Hyperactivity Disorder (ADHD), Alzheimer's disease, Parkinson's disease, and pain management in general. She is also focussing on research into antimicrobial prescribing as well as complementary and alternative medicine usage. Prof Truter, an NRF C2-rated researcher, holds doctorates in both Business Management and Pharmacy Practice.

Prof Truter is currently involved with research into gender differences in prescribing together with collaborators at the Karolinska Institute, Sweden, and she is also collaborating with researchers in the United Kingdom and Australia on antimicrobial prescribing.

Prof Truter's research unit has produced 58 peer-reviewed research articles, 162 articles in professional journals, two book chapters, just over 400 local and international conference presentations, and she has supervised 43 Honours, Masters' and Doctoral studies to date. Prof Truter is currently

involved with research into gender differences in prescribing together with collaborators at the Karolinska Institute, Sweden, and she is also collaborating with researchers in the United Kingdom and Australia on antimicrobial prescribing. Highlights in 2012 include a national award for the Best Publication in Pharmacy Practice in South Africa from the Academy of Pharmaceutical Sciences. Her Masters student (Razia Gaida) was the joint runner-up of the Academy of Pharmaceutical Sciences Young Scientist Award. Prof Truter delivered a paper on developing methods to meet local needs in a global environment, focusing on Africa, as part of a symposium at the 28th International Conference on Pharmacoepidemiology and Therapeutic Risk Management in Barcelona, Spain in August 2012. She was also invited to present a paper at the ATC/DDD Methodology Course in Johannesburg (this course was arranged by the WHO Collaborating Centre for Drug Statistics Methodology, Oslo, Norway). Prof Truter has been the NMMU Faculty of Health Sciences Researcher of the Year for three consecutive years.

Faculty Emerging Researcher of the Year



Dr Cheryl Walter

Dr Cheryl Walter is a lecturer in the Department of Human Movement Science. Her research focuses on understanding and promoting physical activity especially among school children, as well as women and girls from marginalised communities. Dr Walter initiated a project in 2010, called PasSPORT to Health, which is aimed at promoting physical activity and sport at disadvantaged schools. The project has been a platform to conduct socially engaged research: examine physical activity patterns, investigate perceived barriers to physical activity by girls, pilot relevant interventions with HMS students' involvement, and participate in action research with project schools. Her research compliments the research drive in the Department under leadership of Prof du Randt focusing on movement development with the view to promote systematic long-term participant development with subsequent health and sport performance benefits.

Griffiths Mental Development Scale



Prof Louise Stroud

Prof Louise Stroud is the Director of the School of Behavioural Sciences, which houses Social Development Professions, Environmental Health and Professional Psychology. Her main areas of research are in Child Development, Neuro-Psychology and Psycho-Biographical research. Her focus area though is Child Development, more specifically Psychological Test Development.

For the past two and a half years, she has been the lead researcher in a project of international magnitude - to revise the Griffiths Mental Development Scale. This is a test that can be used with children from birth to five years and eleven months. She is working on this venture within the auspices of Association for Research in Infant and Child Development (ARICD), which is based in London, in the United Kingdom.

For the past two and a half years, she has been the lead researcher in a project of international magnitude - to revise the Griffiths Mental Development Scale.

The Griffiths Mental Development Scale has five subscales: the Locomotor, Personal, Social and Emotional, Language and Communication, Eye-Hand Co-ordination and Foundations of Learning. Foundations of learning takes a closer look at thinking, planning, memory, reasoning, and problem solving. The Foundations of Learning Subscale is the one whose development is under the leadership of Prof Stroud. How kids reason, think, view things and plan are aspects assessed in the Foundations of Learning.

Play is universal among children, and how children play provides insights into how they develop. Notwithstanding the advent of technology, children need to play in the mud and the sands. It speaks volumes of the prowess of Prof Stroud as a researcher that she is leading an international team in the revision of this version of the Griffiths Mental Development Scale.



Child drawing in UCLIN waiting room

Aspects of culture fairness, as well as taking into account the urban and rural divide are factored in, as items are developed for the various subscales of this test. This test ...” is a test of breadth, not depth.”

In terms of enabling factors, Prof Stroud singled out the mentoring and consultancy provided especially by Prof Cheryl Foxcroft, as well as Mr Johan Cronje, the Research Psychologist on the team. Fellow colleagues and researchers in the Department of Psychology, time and space to travel provided by NMMU, and her family have also been powerful enablers.

Aspirant researchers are encouraged not to be afraid to make mistakes – but most importantly – to learn from mistakes. Upcoming researchers are also encouraged to have the ability to laugh at themselves. Keep pushing yourself, and never fear to have a voice – “be a voice, not an echo,” Prof Stroud advises.

Exercise and HIV Research

The Faculty of Health Sciences is involved in collaborative research with Prof Harris from Northeastern University, Boston, USA. The collaboration involves the co-supervision of two Research Masters students by Prof du Randt and Prof Harris. Ms Sue-Anne van Eck, who is conducting research on “Physical activity and other selected health promoting behaviours of university students living with HIV” and Ms Jennifer Lotter whose research is on “The effects of a community based exercise programme on the health and well-being of people living with HIV in a rural community of the Eastern Cape”.



Units from Journal Articles

Name of Department	Units
Human Movement Science	1.5
Nursing Science	4.167
Pharmacy	2.5
Psychology	5.33
TOTAL	13.497

UNITS

Cyclic Peptide Research Unit

Leader: Prof PJ Milne

As part of its mission and purpose, the Cyclic Peptide Research Unit (CPRU), aims to research the chemical, biological and pharmaceutical properties of cyclic peptides in an endeavour to improve human life, mentor and train students in multidisciplinary research according to international standards. To this end, the CPRU has continued to contribute to student development in scientific research and the possibility of developing a novel therapeutic agent during the period under review. Research outputs generated in 2012 include the publication of one peer-reviewed journal article, the presentation of a conference proceeding paper, the graduation of two MSc students and three PhD students were being promoted.

Drug Utilisation Research Unit

Leader: Prof I Truter

The Drug Utilisation Research Unit’s (DURU) primary aim is to promote, educate and inform relevant stakeholders about the rational and cost-effective use of healthcare resources, with specific emphasis on the management of medicines. To realise its primary aims DURU during 2012 continued to produce a constant stream of postgraduate students and research outputs that focused on the management of medicines. Highlights for 2012 included a national best publication award in Pharmacy Practice and a runner-up best podium presentation student award, increased international recognition, and the first PhD graduate in the Faculty of Health Sciences who completed his Doctorate based on a compendium of research articles. Eight journal articles were published in accredited journals, fifteen international conference and twelve national papers were read.

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



The Faculty of Law continues to maintain its number of research outputs, despite the fact that we currently have the highest staff student ratio in the institution. In addition, a number of the staff members are currently working towards higher qualifications. We hope, however, that by the end of 2014 three additional staff members will have their doctorates and a number of staff will be well on their way with their doctoral research.

The Faculty of Law's research strategy forms part of the Faculty's Strategic Plan 2012-2014, which has been aligned with Vision 2020 of the University. A few aspects worth noting include the following:

- (a) A focus on the improvement of staff qualifications, especially LLD;
- (b) Collaborative publication between academic staff within and across disciplines;
- (c) Co-publications with LLM and LLD students;
- (d) HEAVA professors contribute towards outputs;
- (e) Appointment of past LLD students as research associates and consequent outputs flowing from that; and
- (f) Writing retreat to commit academic staff to complete and submit their outputs.

The above takes place against a background of a Faculty that has the highest student to staff ratio of 1:51 at the NMMU. Despite that, we endeavour to make sure that as far as practicably possible, research is undertaken, as it is part of the core functions of academia.

The Faculty has built up a reputation over the past few years for hosting conferences, both with regard to the organisation and the standard of the papers delivered at these conferences.

Our HEAVA professors continue to make a valuable contribution to our faculty research. Prof Pieter Badenhorst, visiting professor, who is also a former faculty member, has again published six research articles. Prof Eltjo Schrage, honorary professor in the Department of Private Law and emeritus professor of the University of Amsterdam, has also been prolific both with regard to publication and conferences. Prof Schrage is also a supervisor and mentor to members of faculty. Prof Frans Marx, emeritus professor, is leading the field in IT law and he is regularly asked to

deliver papers and conferences or to address groups of people on IT law related matters, such as cyber-bullying.

Our top researcher this year was Prof Avinash Govindjee, who won the Faculty Researcher of the Year Award for the second time in 2012. Dr John von Bonde was the recipient of the award for the Best Emerging Researcher.

The Faculty has built up a reputation over the past few years for hosting conferences, both with regard to the organisation and the standard of the papers delivered at these conferences. The Fourth Annual Private Law and Social Justice Conference, held in August, again attracted speakers from all over the country and we also had three international speakers, namely Prof Eltjo Schrage (emeritus professor from the University of Amsterdam), Dr Suvianna Hakhaletto-Wainio from Helsinki, Finland and Prof Kunihiko Yoshida from Japan.

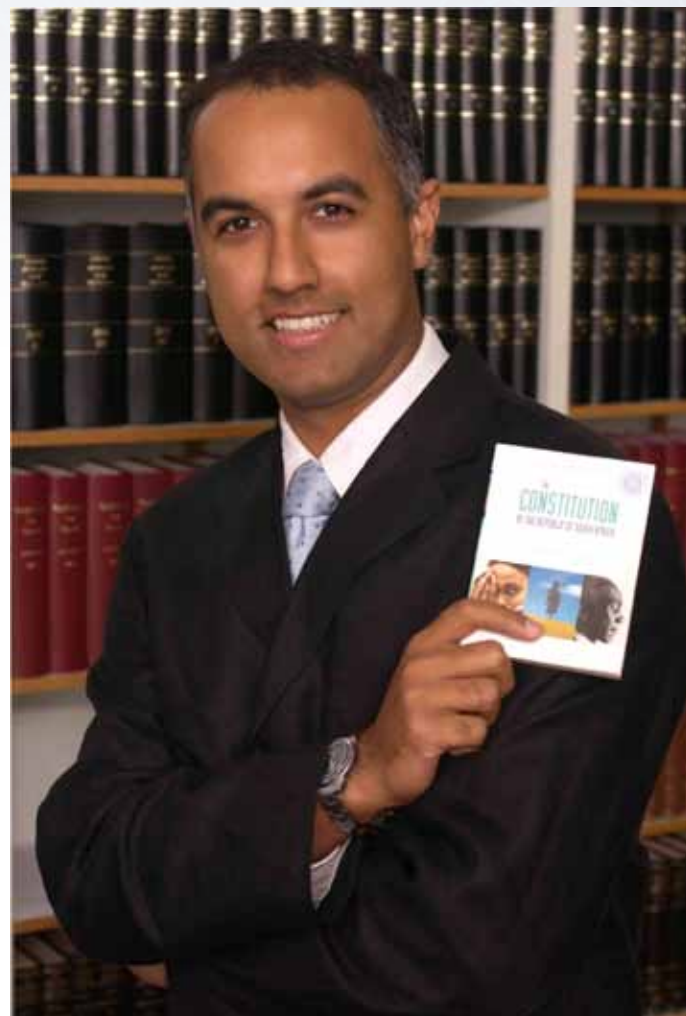
The Faculty, under the auspices of the Institute for Law in Action, held a conference on Local Government Law in October, covering a wide spectrum of topics dealing with local government, including corruption and the legislation governing municipalities. The Department of Criminal and Procedural Law hosted its annual Anti-Corruption Conference, also in October.

The Faculty also hosted the Conference of the Society of Law Teachers of Southern Africa. This conference is held every 18 months and law teachers from all over Southern Africa deliver papers on a variety of legal topics. We hosted speakers and delegates from all Southern African universities.

Although legal research is founded on general principles, our staff are nevertheless continuously finding niche areas, such as banking law (particularly financial inclusion and international remittances), IT Law (including cyber-bullying and cloud computing) and medical law. Ongoing research includes the law of the sea, headed by the incumbent of the Faculty SARChI chair, Prof Patrick Vrancken.

Prof Vivienne Lawack
Executive Dean: Faculty of Law

Faculty Researcher of the Year



Prof Avinash Govindjee

Avinash Govindjee is Professor of Law and Deputy Head of the Labour and Social Security Law Unit at the Faculty of Law, Nelson Mandela Metropolitan University. He holds the BA and LLB degrees from Rhodes University, obtained his LLM degree in Labour Law (cum laude) at the University of Port Elizabeth and was awarded his LLD degree in 2005 from the NMMU. Prof Govindjee is an Attorney of the High Court of South Africa, practising as a consultant to the firm Burmeister de Lange Soni Incorporated in Port Elizabeth. He serves the Commission for Conciliation, Mediation and Arbitration on a part-time basis as a Senior Commissioner and arbitrates disputes for various bargaining councils. Prof Govindjee holds a standing Visiting-Professorship from the National Law School of India University, Bangalore, India.

As a consultant to the Institute for Social Law and Policy (ISLP) and the International Institute for Social Law and Policy (IISLP), and in collaboration with Prof Marius Olivier and other colleagues from South Africa and abroad, he has been fortunate enough to be involved in a range of social security-related research projects for various South African government departments and agencies, including the Department of Social Development, the Compensation Fund, the Unemployment Insurance Fund and the South African Social Security Agency.

Prof Govindjee has been the NMMU Faculty of Law Researcher of the Year for the past three years and is one of the Nelson Mandela Bay Business Chamber's Top 40 under 40's for 2013. He has also been included in the Mail and Guardian's 200 Young South Africans list for 2013.

Prof Govindjee's research is focused on addressing deficiencies in international policy approaches on matters pertaining to labour and social security law. During 2012, for example, he co-authored a publication for the Malaysian Social Security Organisation on the notion of early return-to-work following occupational injuries and diseases, and co-developed a policy document for the South African Department of Social Development pertaining to the social security position of non-citizens in South Africa. Prof Govindjee has published widely in South Africa and abroad on themes broadly related to labour law, social security law, constitutional law and human rights and is frequently invited to address conference audiences in these areas. He plans to focus more on the intersection between social security law and labour law, also in the area of migration.

Faculty Emerging Researcher of the Year



Dr John von Bonde

Dr John von Bonde is a Senior Lecturer in the Department of Criminal and Procedural Law. Criminal Law is his general area of research. Two particular focus areas of his research are the legal position of victims of crime and the combating of organised crime. The position of victims of crime requires the consideration of Restorative Justice, which is gaining recognition as a criminal justice response to crime, both locally and internationally.

Diversity and the Law

Adv Denson lectures in the Department of Private Law and specialises in Family Law. The research undertaken for her studies towards an LLM degree was titled "The Effect of the Constitution on Family Law in South Africa" and concentrating particularly on how the enactment of the Constitution affected the law relating to Muslim marriages, same-sex partnerships, domestic partnerships and child law. She is currently registered for doctoral studies, which entail a comparative analysis on Islamic Family law, in particular the law relating to husband and wife. At present, Muslim marriages are not granted legal recognition in South Africa. In 2011, Parliament tabled a bill dealing with the possible recognition of Muslim marriages. This bill has, however, not been enacted as legislation. Her LLD research therefore focuses on the recognition and implementation of Muslim Personal law in South Africa.

The Constitution provides for equality for all South African citizens and that there should be no discrimination on the basis of religion, culture, etc. On this basis it is submitted that Muslim Personal law should be granted legal recognition. One of the countries included in her sample is Australia. Australia, being a common wealth country is in the same position as South Africa as far as the recognition and implementation of Islamic law is concerned. To this extent internal pluralism exists within the Australian Muslim community as the majority of Australian Muslims have to varying degrees, developed diverse strategies to ensure compliance with Islamic law and Australian law. Recently, however, there have been calls by the Australian Federation of Islamic Councils (AFIC) for the establishment of Islamic courts in Australia.

Her LLD research therefore focuses on the recognition and implementation of Muslim Personal law in South Africa.

Since the inception of the NMMU Private Law and Social Justice Conference five years ago, Adv Denson has presented a paper each year on various topics, for example, the best interests of the child, Muslim marriages and domestic partnerships.

Units from Journal Articles

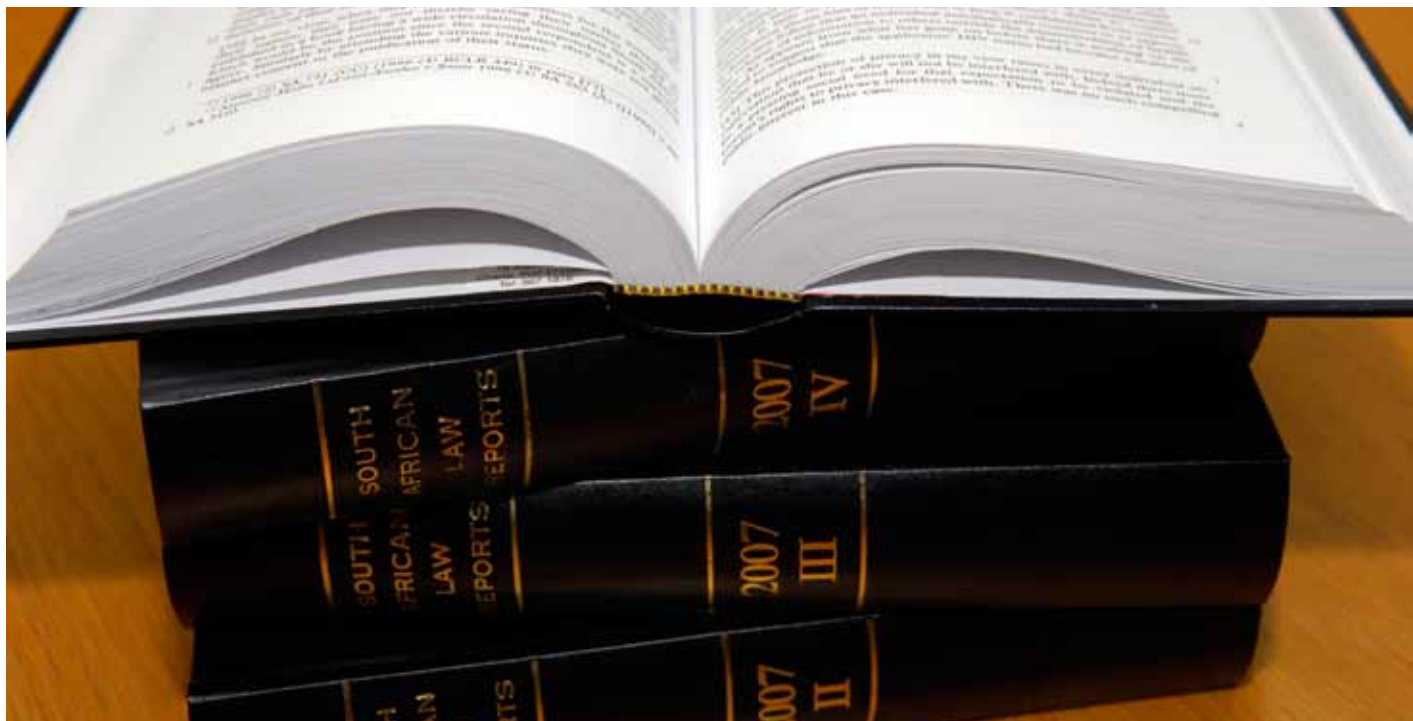
Name of Department	Units
Public Law	2.5
Mercantile Law	5.5
Private Law	5.33
Dean's Office	2
TOTAL	15.33

UNIT

Labour and Social Security Law Unit

Leader: Prof JA van der Walt

The Labour and Social Security Law Unit (LSSLU) mission is to provide practical training programmes and research in labour and social security law. During 2012, LSSLU continued to present and expand high quality training and research outputs in the form of articles, seminars and conferences on Labour Law. A highlight for 2012 was specialising in Education Labour Law. It also set the scene for expansion of research and training in other SADC countries and the members of the LSSLU contributed to the publication of a text book. Six journal articles were published in accredited journals, four book chapters and three international and three national conference papers were published.



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

| Dean's Overview



The Faculty of Science can look back on 2012 with great satisfaction, having accomplished much from a research and engagement perspective. In support of Vision 2020, the Faculty has focused on a number of strategic interventions to increase the quality and impact of its research and engagement endeavours.

In support of Vision 2020, the Faculty has focused on a number of strategic interventions to increase the quality and impact of its research and engagement endeavours.

These are the following:

- To increase the number of academic staff with completed doctorates. The Faculty has recognised that this is absolutely key to growing a research culture. Working closely with the Department of Research Capacity Development, the Faculty has created opportunities such as sabbaticals and funding interventions to enable staff to make progress with their doctoral projects. The hard work has paid off, with more than two-thirds of the Faculty now with doctorates, and more than ten staff registered for doctoral studies. This has immediately increased the Faculty's capacity to enroll Masters and Doctoral students, who now number around three hundred - most of whom are studying full-time.
- To provide financial and other support for emerging researchers and new staff, so that they can quickly reach the stage where from a funding viewpoint they are independent and can take charge of their research careers. Part of the support has also included assistance with preparing proposals for funding calls. In so doing, this has ensured that the Faculty is more responsive to external funding calls. This intervention has resulted in more research and engagement funding being attracted by the Faculty than in previous years.
- To provide financial incentives in the form of bursaries for our postgraduate students who have a manuscript accepted for publication in an accredited journal. This has gone a long way to ensure that a culture of publishing is created amongst our research students.
- To encourage staff to work together in multidisciplinary research groups. The defined Faculty research themes, which are linked to the Institutional Research Themes, have helped to focus much of the research being conducted in the Faculty.

These interventions, which will continue for the next number of years, have already enabled the Faculty to make great strides in growing a research and engagement culture.

Having received the news early in 2012 that three of our applications for SARChI Chairs were successful, much effort went into preparing proposals for the nominations of suitable recipients. We were delighted that our three nominated persons (Prof David Bell, Prof Renzo Perissinotto and Prof Paul Watts) were accepted by the NRF and were able to take up the prestigious positions.

The Faculty was also thrilled that the SARChI Chair in Nano-Photonics, which has been occupied by Prof Reinhardt (JR) Botha for the past five years since its inception, went through a successful review process and has been given financial support for a further five years. A further highlight for Prof Botha's group was the commissioning of a new purpose-designed and state-of-the-art metal-organic chemical vapour deposition (MOCVD) system for the controlled deposition of atomic layers of group III-V compounds for various semiconducting applications. The group enjoys considerable international recognition and collaborates with researchers in Norway, Sweden, Germany and the UK.

The beginning of 2012 represented a change in the management structure of the academic programmes running on the George campus, and the School of Natural Resource Management became part of the Faculty of Science, along with the Sustainability Research Unit headed by Prof Christo Fabricius. With the new structure in place and a strong support base in Port Elizabeth, it has been possible to substantially grow the number of Science postgraduate students on the George campus. This exciting development has been welcomed by stakeholders, and there is great potential for further growth, especially within the broad themes of natural resource management and sustainability.

The micro-algae project of InnoVenton continues to be a flagship project for which the Faculty is justly proud. Considerable financial commitment was received during 2012 from the Technology Innovation Agency (TIA) of the Department of Science and Technology, as well as from Sasol, Eskom and other important stakeholders. TIA specifically has requested that the project be "fast-tracked" to bring it to the commercialisation stage more quickly.

The Faculty's commitment to re-establish Coastal and Marine Research as a strength of the NMMU gained further momentum during 2012, with members of Faculty participating in a week-long exploratory visit to Japan. The strong partnership with the Oceans and Coasts division of the Department of Environmental Affairs resulted in support in the form of several research grants focusing on marine biology. Dr Ronel Nel, ably supported by a group of colleagues and enthusiastic students, hosted a very successful Sixth International Sandy Beach Symposium, attended by

delegates from 13 countries. Later in the year, representatives from ten Western Indian Ocean (WIO) countries gathered at NMMU for the 4th meeting of the Marine Turtle Task Force, also organised by Dr Nel.

Through the research being conducted, many students have received training that will enable them to make a critical and constructive contribution to sustainable development in Africa and further afield.

In closing, while too many to mention, all the research and engagement activities of the Faculty of Science in 2012 have contributed to raising the profile of the NMMU, both nationally as well as internationally. Through the research being conducted, many students have received training that will enable them to make a critical and constructive contribution to sustainable development in Africa and further afield.

Prof Andrew Leitch
Executive Dean: Faculty of Science

Faculty Researcher of the Year and NMMU Researcher of the Year



Prof Tommy Gerber

Prof Tommy Gerber, Professor of Inorganic Chemistry and Head of the Department of Chemistry, has been involved in the coordination chemistry of the metals rhenium and technetium, and their application in nuclear medicine, for the last 30 years.

Compounds of technetium isotopes are used in the diagnostic imaging of organs in the human body, with complexes of rhenium isotopes finding application as therapeutic agents in the treatment of cancer.

Prof Gerber's research has lately focused on rhenium, and he is involved in collaborative research with scientists at the South African Nuclear Energy of South Africa (NECSA), and the Universities of Mauritius, Razi (Iran) and Bogasizi (Turkey). He has published a total of 157 comprehensive research papers in this particular field, some with co-authors from the Universities of Oxford, Qviedo, Munich and Padova. He has also trained 14 PhD and 18 MSc students.

Prof Gerber regularly acts as external examiner for postgraduate MSc/PhD students from national and international universities. He has made a total of 41 personal contributions to international conferences, in addition to numerous contributions by his research students. He acted as referee for most Inorganic Chemistry journals in the world, and currently serves on the editorial boards of four International journals. He was also a member of the Steering/Scientific committees of nine international conferences.

Faculty Emerging Researcher of the Year



Dr Pierre Pistorius

Dr Pierre Pistorius's primary interests relate to population and behavioural ecology and the conservation of marine top predators, such as seabirds, seals, sharks and dolphins. The role of environmental factors, including climate and fisheries related changes, in governing population numbers and community structure forms a focal part of his research. Unfortunately, a large proportion of marine top predators are threatened. Their population numbers are sensitive to lower level perturbations, and fisheries have largely impacted on prey availability. As the taxonomic group with the largest proportion of red listed species, seabirds in particular are in peril. This is partly because of competition with fisheries but also because of accidental fisheries by-catch. For these reasons his research group studies the ecology and behaviour of these threatened species to better understand and manage key processes driving their spatial and temporal dynamics.

The world's marine ecosystems are changing rapidly as a result of anthropogenic activities and climate change. Understanding ecosystem variability at multiple temporal and spatial scales is now a central focus in marine ecology.

The world's marine ecosystems are changing rapidly as a result of anthropogenic activities and climate change. Understanding ecosystem variability at multiple temporal and spatial scales is now a central focus in marine ecology. Dr Pistorius is therefore also interested in the use of seabirds

as indicators of the state of the marine environment and their potential use in ecosystem based management. At the upper levels of the food chain, they are particularly responsive to changes in their environment, absorbing lower level effects. Changes in their demographics and behaviour are therefore often symptomatic of environmental change, and can guide management of their prey resources, which are often of economic importance.

With a strong interest in island systems, Dr Pistorius is currently involved in two research programmes funded in 2012 for a three-year cycle through the South African National Antarctic Programme (SANAP) at the Prince Edward Islands. The subantarctic region hosts large numbers of seabirds, such as penguins and albatrosses, as well as seals that feed in these productive waters. The effects of climate change are, however, most evident towards the poles, and the interaction of large scale oceanographic processes, climate change and the welfare of marine top predators in this region is of particular interest. His research in the Southern Ocean also extends to the Falkland Islands where he researches Gentoo penguins, using novel technological advances to better understand foraging behaviour. Closer to home, Dr Pistorius focuses his attention on Cape gannets, Cape fur seals and African penguins at Bird Island, Algoa Bay, with his students spending field time on this island that hosts the largest gannet colony in the world. Moving away from the islands, in the southern Cape and in collaboration with the Department of Environmental Affairs (branch Oceans and Coasts), Dr Pistorius runs two programmes, one related to the conservation of dolphins and another on biodiversity in Marine Protected Areas.

Dr Pistorius is currently collaborating internationally with among others the Seychelles Islands Foundation (SIF), Norwegian Institute for Nature Research, Deakin University (Australia) and the University of Montpellier (France). Nationally he collaborates with researchers from the University of Cape Town, University of Pretoria and Department of Environmental Affairs (Oceans and Coasts) and Bayworld Museum. He is an external member of the Centre of Excellence at the Percy FitzPatrick Institute for African Ornithology. During 2012 he supervised six postgraduate students, and published five peer-reviewed papers.

Coastal Fish Ecology



Dr Nadine Strydom

Dr Nadine Strydom is South Africa's leading expert on the early developmental stages of coastal fishes. She holds a PhD in Ichthyology (Rhodes University) and her research expertise spans rivers, estuaries, nearshore and open ocean ecosystems.

Dr Strydom is particularly interested in distribution, abundance, movement, feeding and habitat use by the larval stages of coastal fishes as they gradually grow into juvenile fish. Most marine fish hatch from eggs that are spawned by adult fish in the ocean. The larvae of these species undergo a metamorphosis as they drift shorewards 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 great progress in the understanding of the early life history of coastal fishes.



Dusky kob, *Argyrosomus japonicus* at two weeks old (4.5mm)

In 2012, Dr Strydom, in conjunction with her small team of postgraduate students, completed numerous fish related research projects, all of which have been submitted for publication in national and international journals. These include a detailed description of shallow water currents in the Algoa Bay nearshore and their implications for larval fish import and export from the Bay; the effects of wave exposure on the use of surf zone nursery areas by larval stage fishes in Algoa Bay; long-term trophic level shifts in surf zone fish composition in response to the collapse of coastal fish populations; a review of larval fish dynamics in 25 estuaries from temperate South Africa and the feeding ecology of the larval stages of important recreational fish species such as Spotted grunter (*Pomadasys commersonnii*) in estuaries. Dr Strydom also assisted in the completion of a book, of which she is a co-author, on the larval stages of fishes in the coastal waters of Kenya.

In 2012, Dr Strydom, in conjunction with her small team of postgraduate students, completed numerous fish related research projects, all of which have been submitted for publication in national and international journals.

Numerous studies were in progress in 2012, one of which is an extensive study into the habitat use of larval stage fishes in Algoa Bay. This work assessed the role of different types of reefs in the Bay in the settlement choices of young fishes. Light traps were also used for the first time in Algoa Bay, in conjunction with towed nets to sample these larval fishes.

Other studies that were active in 2012 were an assessment of the effects of rainfall and river discharge on anchovy and pilchard fish spawning and larval survival in Algoa Bay. The first comprehensive pollution study was initiated by Dr Strydom in 2012 on the Swartkops Estuary 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 little is known about pollution levels that could potentially impact human health.

Publications in 2012 included research on the diet of eel elvers (*Anguilla mossambica*) in the Sundays River, a multi-authored collaborative review of the ecology and management of intermittently open estuaries, zooplankton assemblage structure in the Sundays Estuary; and the temporal and spatial dynamics of ichthyoplankton in the Sundays Estuary.

Dr Strydom received a well-deserved C2 research rating from the National Research Foundation.

Units from Journal Articles

Name of Department	Units
Agriculture and Game Management	1
Botany	12.852
Geosciences	6.78
Zoology	12.662
Biochemistry and Microbiology	10.23
Chemistry	27.27
Textile Science	2.23
InnoVenton	1
Mathematics and Applied Mathematics	4.499
Statistics	3.588
Physics	31.01
Computing Sciences	2.5
Natural Resource Management - George	7.11
TOTAL	122.731

UNITS

Coastal and Marine Research Unit

Leader: Dr D du Pree

The Coastal and Marine Research Unit (CMR) had a productive 2012, which was informed by its mission to provide relevant, up-to-date information and expert advice on all aspects of environment management of the coastal zone of Africa. To this end, a highly successful Sandy Beach Symposium was hosted by the CMR in June 2012. Significant collaborations were forged, expanded and developed with stakeholders such as South African Institute for Aquatic Biodiversity, South African Environmental Observation Network, Oceans and Coasts, Bayworld and leading international researchers. Thirteen journal articles were published in accredited journals, thirteen international and one national conference papers were published. Two Doctoral students and nine Master students graduated.

Sustainable Research Unit

Leader: Prof C Fabricius

The Sustainability Research Unit (SRU) is steadily achieving its stated mission, which is to develop capacity for the sustainable management of ecological, social and economic systems through user-inspired research, training and policy contributions. For the 2012 period the postgraduate numbers have grown exceptionally and the Unit is looking forward to a productive 2013. Highlights for 2012 were the successful application for a collaborative Water Research Commission grant with CSIR, submitting an international collaborative proposal to Round 2 of the Belmont Forum, which was successful with NMMU as the Lead P1 Institution and strengthening our national and international ties. SRU members produced three peer reviewed papers, two scientific reports and presented eight conference papers during 2012. Three journal articles were published in accredited journals, one international and seven national conference papers were delivered. One Masters degree student graduated.



Prof Christo Fabricius

Conference hosted at NMMU

SASA 2012 Conference Report

The 54th annual South African Statistical Association (SASA) conference was held on the South Campus of the Nelson Mandela Metropolitan University (NMMU) from 5 November to 9 November 2012. The conference was hosted by the NMMU Statistics Department and was a resounding success for all involved.

From initial registration to workshops and presentations, every aspect of the conference provided those who attended (both younger and older) the opportunity to showcase, learn and share their ideas and research with one another. The chance to network with those from all over the world was taken by all as delegates met between sessions, during tea – and lunch times and social evening functions. The Statistics Department also saw the opportunity to expose our postgraduate students who could not afford to officially attend the conference, to delegates by appointing them as assistants.

The Conference was officially opened by the 2012 President of SASA, Dr Gary Sharp after which the Dean of the Faculty of Science, Prof Andrew Leitch welcomed all the delegates. The Statistics Department catered to every need of those attending, which culminated in a spectacular gala dinner held at the Willows

The diversity of those who attended was very evident with a total of 213 delegates attending the Conference from nine different countries (including South Africa). A very encouraging fact was that 42 (19.7%) students attended the conference of which eight were studying at NMMU. A total of 129 delegates also attended the five workshops on offer.

An impressive 112 presentations were made of which ten were accepted for peer reviewed publication available in the conference proceedings (ISBN: 978-1-86822-621-4 - a conference booklet containing all the abstracts and the complete program is available on request). The two invited guests, Prof Jeffrey Racine from Canada and Prof Nick Fisher from Australia, both also presented plenary sessions. The seminars presented at the SASA 2012 conference, including those presented by students, were of a very high standard as was also indicated by Prof Jeffrey Racine. Prof Jeffrey Racine wrote: "I must say that I was so very impressed by the poise and delivery of the presenters, particularly those given by students. I have never attended a conference where the caliber of presentations was uniformly as high among the student presenters as it was during SASA 2012".

Both Prof Racine and Prof Fisher also commented on the state of Statistics in South Africa as well as on the SASA 2012 conference in general:

Prof Racine wrote: "In summary, the SASA organisers made efficient use of my time, provided multiple opportunities to interact with students and faculty, and left me with a sense of how talented and eager the students and faculty are in SA. This is even more remarkable given the

resource constraints they face, mounting pressure on a falling number of Professors, and challenging demographics surrounding the age cohort of many faculties. You are to be congratulated on your dedication, spirit, and achievements of which you have the right to be most proud.

Thank you all for your generous and warm hospitality and for the wonderful opportunity. It was truly a pleasure to witness the superb range of talent and interests showcased during my visit, and I look forward to crossing paths with many of you in the not too distant future."

Prof Fisher wrote: "I was particularly struck by the large number of enthusiastic young statisticians, both in universities and in business and industry. Numerically, they dominated the audience in all my presentations, they were interested in what I was discussing in spite of the somewhat off-beat nature of the topics I presented, and asked good questions. This is a very healthy state of affairs.

... In contrast, what one might call the mid-career "leadership" cohort is (numerically) understrength, as is the case in Australia. This wasn't simply an isolated observation by me: it was a point stressed by Herrie van Rooy in a report to the SASA Conference based on survey results. As with the Statistical Society of Australia, this constitutes a matter calling for expeditious action by the professional society and other interested parties such as major employers of statisticians.

... The annual SASA conference proved to be a heroic effort by Gary Sharp and his colleagues, together with a large number of ubiquitous, very friendly and helpful students who were always on hand to point a confused Australian in the right direction. Running conferences is a demanding business, as I can personally attest, so I trust that they feel rewarded for their efforts. The scientific programme featured a wide range of stimulating contributions, and the sessions I attended featured healthy but good-natured discussion. The catering for meals and social events was excellent and beyond the combined capability of the attendees to exhaust."

Doctorates

Vukile Tshazibana



Education

Challenges of instructional leadership in historically disadvantaged schools in South Africa

The aim of Dr Tshazibana's study was to carry out an investigation of challenges faced by principals of historically disadvantaged schools as instructional leaders facilitating the implementation of curriculum policies.

The sample of the study consisted of 25 school principals, 80 teachers and 11 Department of Education officials, a sample size more than adequate for qualitative analysis. In the second study the participants were principals, teachers and departmental officials who could be contacted, who had access to online computer technology, and who independently and voluntarily consented to completing an online questionnaire anywhere in South Africa.

Some of the main findings were that the principals noted that subject advisors failed to visit their schools leaving principals with the burden of guiding teachers in areas they were not trained themselves, which often led to confusion on the part of the teachers who were often not sure of what was expected of them. The findings suggest that there are policy implementation gaps in the education system that need to be investigated and interrogated and that principals, as leaders of curriculum implementation at school level, need to be adequately prepared for this task.

This study was an attempt to contribute to the discipline of School Management and Leadership and focused on the core business of transforming schools, i.e. that of curriculum implementation and instructional leadership.

Some main recommendations of the study were:

- Further exploration is required to identify mechanisms for supporting principals in historically disadvantaged schools to put them on par with principals of other school types, which function smoothly and effectively.
- An exploration of a study into the mechanisms for supporting principals of historically disadvantaged schools in instructional leadership and curriculum implementation, and the reasons why they work and do not work in varying contexts.
- Research on the selection and appointment process of school principals in historically disadvantaged schools and other schools in general. Data generated in this study suggests that the current process needs to be reviewed to identify its weaknesses with the aim of strengthening it so that it can help identify and appoint capable candidates.
- Explore possibility of providing a firm base for creating a pool of aspirant principal candidates identified in advance via a principal preparation programme supported by the DHET.

Ntsikelelo Breakfast



Development Studies

Market triumphalism and the South African state: a case study of local government in the Eastern Cape

In South Africa, local government is seen to be the frontline in the delivery of services to the broader population. Local economic development gives expression to the state's economic imperatives through the agency of integrated development plans. It is therefore unsurprising that local economic development is a profoundly contested intellectual and political terrain. The GEAR strategy has promoted pro-market policies, which are dependent on private-public partnerships and outsourcing, via the extensive use of tenders.

Using a political economy perspective, and a qualitative and quantitative, triangulated approach, the candidate has thoroughly examined the development strategies used at local government level in the two metropolitan municipalities of the Eastern Cape, namely the Nelson Mandela Metropolitan Municipality, and Buffalo City. The study has used questionnaire-based surveys as well as semi-structured, in-depth interviews as data gathering instruments.

The research findings support the hypothesis: "The local development policies of Public-Private Partnerships and Broad-based Black Economic Empowerment that are being applied through Local Economic Development strategies are not in the interests of the majority of people living in the Eastern Cape". They show an overwhelming popular rejection of current development policies, which are widely associated with a neo-liberal approach, and which consistently fail to deliver services in line with expectations, and seem to encourage corrupt practices, in respect of the outsourcing of services, which results in the advancement of a small number of politically well-connected individuals, rather than in the improved welfare of the general population.

This thesis forms part of the contemporary, scholarly debate, and has made a valuable contribution to the understanding of local economic development in the urban centres of the Eastern Cape. It highlights the need for nation wide research on the topic.

Sharon Munyaka



Industrial Psychology

The relationship between authentic leadership, psychological capital, psychological climate, team commitment and intention to quit in a South African manufacturing organisation

The main aims of the study were to determine the structural invariance of the measuring instruments when applied to a South African sample in the manufacturing sector and to determine the relationships between a number of Positive Organisational Behaviour variables.

The study involved a number of constructs and their underlying dimensions in an attempt to determine the relationships between the constructs and between their underlying dimensions. The constructs included in the study were authentic leadership, psychological capital, psychological climate of the organisation, the commitment the participants felt to the work teams of which they were members, and the strength of their conviction about staying or leaving their present organisation of employment. The possible relationships between the constructs, their dimensions and biographical variables were also examined. A number of multiple regression models were built.

Results of the analyses carried out, showed significantly strong relationships between the variables. Of note is the marked relationship that emerged between the scales of authentic leadership and psychological climate with small to high correlations indicated for the sub scales of these two variables. The results from the multiple regression analyses show that 56.8% of the variance of psychological climate is explained by the sub scales of authentic leadership. The study showed the significant differences between the scores of home language and population groups on some of the scores of the scales and sub scales in the study. The study rendered findings that are making an original contribution to the description, understanding, explanation and prediction of behaviour of higher level members of modern-day large and complex organisations.

Savo Heleta



Development Studies

Post-War Reconstruction and Development

This thesis explores post-war stabilisation, restructuring and development interventions in the post-Cold War era with a special focus on three case studies of Bosnia-Herzegovina, South Sudan and Somali land. The dynamics of such activities and ventures are best encompassed and conceptualised within the expanding discipline of Development Studies. Via a qualitative and grounded theory approach, the study shows how the nature and form of the intervention in a post-war and post-conflict situation can and does have quite dramatic effects on the reconstruction and development effort in the country concerned. The study emphasises the importance of grasping the particularity of a particular post-conflict and post-war situation, and shows a substantive relationship between the quality of local and national involvement and participation in the PWRD process, and the sustainability and “success” of the process and efforts in question.

Overall, this thesis constitutes a distinctive and substantive contribution to the theory and practice of post-war and post-conflict reconstruction and development in the 21st century approaches and discourses which traverse conventional disciplinary borders. The study also contributes directly to the growing body of empirical and theoretical literature on the conflict-security-development nexus within the discipline of Development Studies. In addition, the work carries significant implications in regard to the design and implementation of development policies for post-war and post-conflict contexts.

Nokhanyo Mayaba



Education

Exploring the use of folktales to enhance the resilience of children orphaned and rendered vulnerable by HIV and AIDS

The intent of this study was to explore and describe whether and how folktales could be used to enhance the resilience of children who have been orphaned and rendered vulnerable by HIV and AIDS (OVC).

The objectives were to explore the resilience potential of folktales and to investigate ways in which teachers could use folktales to support OVC in a way that enhances the attainment of both pastoral and academic outcomes. The participants in this study were children between the ages of 9-14 years, who were OVC and whose mothertongue was isiXhosa, who lived either in a children’s home or with foster parents.

An action research design was used to explore how folktales could be used. Both the visual arts based methods (drawings, collage and drama) and conventional qualitative methods, such as focus group interviews were used. The finding identified showed there was an indication that resilience was enhanced; and the data provided important information about the lives of the children that could help the teachers to fulfil their pastoral role and lastly although the focus of this study was not an evaluation of the academic value of the process as such, it revealed the potential of the participatory approach to use cultural stories to enhance the literacy and life skills of learners.

Recommendations are that visual methods, such as the ones employed in this study, should be incorporated in the curriculum as part of how teachers could use stories with the children in their classrooms. Teachers could be trained in using folktales as a resource for a holistic approach that could reach subject outcomes and also help to develop the resilience of the children.

Doctorates

■ Faculty of Arts

DOCTOR OF MUSIC

BOTHMA, Erika

Title of Thesis:

SEARCHING FOR THE BAROQUE SPIRIT: AN EXPLORATORY STUDY OF TEACHING STRATEGIES FOR THE SUCCESSFUL PERFORMANCE OF BAROQUE KEYBOARD MUSIC ON THE MODERN PIANO

Promoter: Dr A de Villiers

DOCTOR OF PHILOSOPHY

DRAAI, Enaleen Enchella

(Public Administration)

Title of Thesis:

A CRITICAL EVALUATION OF THE QUALITY OF SOCIAL DEVELOPMENT INTERVENTIONS WITH SPECIFIC REFERENCE TO SOCIAL ASSISTANCE

Promoter: Prof TV Mayekiso

Co-Promoter: Prof JD Taylor

GWARINDA, Shungu Agnes

(Public Administration)

Title of Thesis:

AN ANALYSIS OF THE ROLE OF NON-GOVERNMENTAL ORGANISATIONS IN THE SOCIAL WELFARE POLICY PROCESS: THE CASE OF ZIMBABWE

Promoter: Prof RS Masango

Co-Promoter: Prof JD Taylor

MAJILA, Victoria Thozama

(Public Administration)

Title of Thesis:

A COMPARATIVE ANALYSIS OF ANTI-CORRUPTION LEGISLATION AND ANTI-CORRUPTION AGENCIES IN THE EASTERN CAPE AND NORTHERN CAPE PROVINCES: A GOVERNANCE PERSPECTIVE

Promoter: Prof JD Taylor

Co-Promoter: Prof K Raga

MANDA, Levison Zeleza

(Media Studies)

Title of Thesis:

MEDIA AND AGRICULTURE IN AFRICA: A CASE STUDY OF AGRICULTURE RADIO PROGRAMMING IN MALAWI

Promoter: Dr J Wozniak

MOHAMED, Gishma

(Sociology)

Title of Thesis:

MENTORING FOR BEST EDUCATIONAL PRACTICE: A GENERIC FRAMEWORK FOR WHOLE SCHOOL TRANSFORMATION WITHIN DYSFUNCTIONAL SENIOR SECONDARY SCHOOLS, SOUTH AFRICA

Promoter: Prof FJ Bezuidenhout

Co-Promoter: Mrs E Lombard

■ Faculty of Business and Economic Sciences

DOCTOR OF BUSINESS ADMINISTRATION

BURHAN, Ahmad Mtengwa

Title of Thesis:

MARKETERS' PERCEPTIONS OF NEGOTIATION BEHAVIOUR IN A GLOBAL FIRM

Promoter: Prof E Mazibuko

DAMES, Ricardo Shane

Title of Thesis:

INVESTIGATING SME INCUBATOR BEST PRACTICES TO ASSIST IN CREATING AN ENABLING SME INCUBATION ENVIRONMENT

Promoter: Prof S Perks

MANNIE, Avain

Title of Thesis:

INVESTIGATING KNOWLEDGE SHARING BETWEEN GOVERNMENT AGENCIES IN SOUTH AFRICA

Promoter: Dr H van Niekerk

Co-promoter: Prof C Adendorff

MGEMANE, Lesley Musa

Title of Thesis:

STAKEHOLDER MANAGEMENT FOR URBAN DEVELOPMENT PROJECTS IN SOUTH AFRICA

Promoter: Prof B Eksteen

Co-promoter: Prof C Arnolds

OBERHOLZER, Stephanus Marius

Title of Thesis:

A MODEL TO PROMOTE ENTREPRENEURIAL COMPETITIVENESS IN THE SOUTH AFRICAN TELECOMMUNICATIONS SECTOR

Promoter: Dr MDM Cullen

Co-promoter: Prof C Adendorff

STRYDOM, Kariena

Title of Thesis:

THE RELATIONSHIP BETWEEN DIVERSITY AND ORGANISATIONAL CULTURE AND ITS IMPACT ON STRATEGY IMPLEMENTATION

Promoter: Prof S Perks

Co-promoter: Prof E E Smith

DOCTOR OF COMMERCE

HARRIS, Chantel

(Industrial Psychology)

Title of Thesis:

RELATIONSHIPS BETWEEN PSYCHOLOGICAL CAPITAL, WORK ENGAGEMENT AND ORGANISATIONAL CITIZENSHIP BEHAVIOUR IN SOUTH AFRICAN AUTOMOTIVE DEALERSHIPS

Promoter: Prof AB Boshoff

Co-promoter: Prof RJ Snelgar

LEE, Deborah Ellen

(Economics)

Title of Thesis:

AN APPLICATION OF THE CHOICE EXPERIMENT METHOD TO ESTIMATE WILLINGNESS-TO-PAY FOR AND GUIDE MANAGEMENT OF ESTUARINE RECREATIONAL SERVICES

Promoter: Prof SG Hosking

MUNYAKA, Sharon Audley

(Industrial Psychology)

Title of Thesis:

THE RELATIONSHIP BETWEEN AUTHENTIC LEADERSHIP, PSYCHOLOGICAL CAPITAL, PSYCHOLOGICAL CLIMATE, TEAM COMMITMENT AND INTENTION TO QUIT IN A SOUTH AFRICAN MANUFACTURING ORGANISATION

Promoter: Prof AB Boshoff

Co-promoter: Prof RJ Snelgar

DOCTOR OF PHILOSOPHY

BREAKFAST, Ntsikelelo Benjamin

Title of Thesis:

MARKET TRIUMPHALISM AND THE SOUTH AFRICAN STATE: A CASE STUDY OF LOCAL GOVERNMENT IN THE EASTERN CAPE

Promoter: Dr G Bradshaw

Co-promoter: Prof RJ Haines

HELETA, Savo

Title of Thesis:

POST-WAR RECONSTRUCTION AND DEVELOPMENT: A COLLECTIVE CASE STUDY

Promoter: Prof RJ Haines

Co-promoter: Dr J Cherry

MUSEVENZI, Julius

Title of Thesis:

RURAL LIVELIHOOD DIVERSIFICATION IN SEMI-ARID DISTRICTS OF ZIMBABWE: AN ANALYSIS OF MUZARABANI, GOKWE AND MWENEZI DISTRICTS

Promoter: Dr J Cherry

MWAMAYI, Adam Kibunji

Title of Thesis:

TEXTILE AND CLOTHING INDUSTRY COMPETITIVENESS IN THE SOUTHERN AFRICAN REGION

Promoter: Prof RJ Haines

Co-promoters: Dr M Brookes and Prof G Wood

MWANIKA, Philip Arthur Njuguna

Title of Thesis:

TRACK-ONE DIPLOMACY AND POST-CONFLICT RECONSTRUCTION: KENYA'S MEDIATION OF THE SOMALI CONFLICT AND STRATEGIC INTERVENTION AVENUES

Promoter: Dr L Snodgrass

DOCTOR OF PHILOSOPHY IN COMMERCE

CHANZA, Alfred Witness Dzanja

(Industrial Psychology)

Title of Thesis:

AN ASSESSMENT OF THE MOTIVATIONAL VALUE OF REWARDS AMONG HEALTH PROFESSIONALS IN MALAWI'S MINISTRY OF HEALTH

Promoter: Prof RJ Snelgar

Co-promoter: Dr G Louw

CHIKOKO, Laurine

(Economics)

Title of Thesis:

LIQUIDITY MANAGEMENT BY ZIMBABWEAN COMMERCIAL BANKS UNDER A MULTI-CURRENCY SYSTEM

Promoter: Prof P le Roux

GAYA, Hanningtone Joel

(Business Management)

Title of Thesis:

TANGIBLE RESOURCES TO CREATE SUSTAINABLE COMPETITIVE ADVANTAGE: A CASE STUDY OF TOYOTA KENYA

Promoter: Prof FW Struwig

Co-promoter: Prof EE Smith

JOWAH, Enoch Larry

(Business Management)

Title of Thesis:

CRITICAL CORE COMPETENCIES FOR EFFECTIVE STRATEGIC LEADERSHIP IN PROJECT MANAGEMENT

Promoter: Prof NE Mazibuko

Co-promoter: Prof M Tait

KRÜGER, Janine

(Business Management)

Title of Thesis:

VALUATION OF INTERNET-BASED BUSINESSES

Promoter: Prof FW Struwig

OKWARE, Fabiano

(Business Management)

Title of Thesis:

FACTORS IMPACTING THE PERFORMANCE OF TRAINING INSTITUTIONS IN UGANDA

Promoter: Prof S Perks

Co-promoter: Prof EE Smith

SCHOEMAN, Johannes Dames

(Industrial Psychology)

Title of Thesis:

THE RELATIONSHIP BETWEEN WORKPLACE WELL-BEING, PSYCHOLOGICAL CAPITAL AND WORKPLACE TRUST

Promoter: Prof AB Boshoff

Co-promoter: Prof RJ Snelgar

SENA, Steven

(Business Management)

Title of Thesis:

NATION BRANDING: A CASE STUDY OF ZIMBABWE

Promoter: Prof NE Mazibuko

Co-promoter: Prof M Tait

TSHUMA, Edward

(Business Management)

Title of Thesis:

MANAGEMENT PERCEPTIONS REGARDING PRIVATISATION OF PARASTATALS IN ZIMBABWE

Promoter: Prof NE Mazibuko

Co-promoter: Prof EE Smith

VAN ACHTERBERGH, Leon

(Business Management)

Title of Thesis:

SOCIAL MEDIA REVIEWS TO INVESTIGATE RESTAURANT DINING EXPERIENCES

Promoter: Prof FW Struwig

XINGWANA, Lumkwana

(Business Management)

Title of Thesis:

MANAGEMENT PERCEPTIONS REGARDING SKILLS SHORTAGES IN GOLDMINES

Promoter: Prof EE Smith

Co-promoter: Prof NE Mazibuko

GOBINGCA, Berington Zanoxolo

Title of Thesis:

FACTORS AFFECTING THE IMPLEMENTATION OF THE NATIONAL CURRICULUM STATEMENT IN THE MTHATHA EDUCATION DISTRICT

Promoter: Dr L Athiemoolam

Co-promoter: Prof SE Blignaut

HENDRICKS, Clarence Nowellin

Title of Thesis:

INTEGRATED LEADERSHIP: A LEADERSHIP APPROACH FOR SCHOOL MANAGEMENT TEAMS

Promoter: Dr T Morar

HENDRICKS, Winston Willie

Title of Thesis:

THE EFFECT OF COLLECTIVE EFFICACY ON THE INTRODUCTION OF A NEW CURRICULUM BY MATHEMATICS TEACHERS

Promoter: Prof MM Botha

JEKO, Ishmael

Title of Thesis:

AN IMPROVED MENTORING MODEL FOR STUDENT TEACHERS ON PRACTICUM IN PRIMARY SCHOOLS IN ZIMBABWE

Promoter: Dr AJ Greyling

MANGWAYA, Ezron

Title of Thesis:

TEACHERS' PERCEPTION OF THE STATE OF READINESS FOR THE INTRODUCTION OF GRADE ZERO/EARLY CHILDHOOD EDUCATION IN ZIMBABWE: A CASE STUDY

Promoter: Prof SE Blignaut

Co-promoter: Dr K Pillay

MAYABA, Nokhanyo Nomakhwezi

Title of Thesis:

EXPLORING THE USE OF FOLKTALES TO ENHANCE THE RESILIENCE OF CHILDREN ORPHANED AND RENDERED VULNERABLE BY HIV AND AIDS

Promoter: Prof LA Wood

TSHAZIBANA, Vukile Shadrack

Title of Thesis:

CHALLENGES OF INSTRUCTIONAL LEADERSHIP IN HISTORICAL LYDIS ADVANTAGED SCHOOLS IN SOUTH AFRICA

Promoter: Prof P Webb

Co-promoter: Prof SE Blignaut

Faculty of Education

DOCTOR OF PHILOSOPHY: EDUCATION

BOSCHMANS, Shirley-Annelnez

Title of Thesis:

TEACHING PHARMACOLOGY: ISSUES OF LANGUAGE AND LEARNING IN A MULTILINGUAL CLASSROOM SETTING

Promoter: Prof P Webb

■ Faculty of Engineering, the Built Environment & IT

DOCTOR OF PHILOSOPHY IN ENGINEERING

VAN ZYL, Carlo Angelo Antonio

(Mechanical)

Title of Thesis:

PROCESS HEAT FLOW MODEL FOR TEMPERATURE AND HARDNESS PREDICTION DURING FRICTION TAPER STUD WELDING OF AISI4140

Promoter: Prof H Lombard

Co-promoter: Prof DG Hattingh

WEDDERBURN, Ian Norman

(Mechanical)

Title of Thesis:

A CREEP SAMPLE RETRIEVAL TECHNIQUE AND FRICTION WELD SITE REPAIR PROCEDURE

Promoter: Prof DG Hattingh

Co-promoter: Dr A Botes

DOCTOR OF PHILOSOPHY IN CONSTRUCTION MANAGEMENT

BOTHA, Brink

Title of Thesis:

PROPERTY DEVELOPMENT: A BUSINESS PROCESS MODEL

Promoter: Prof C Adendorff

Co-promoter: Prof JJ Smallwood

DABUP, Na'Ankwat Lami

Title of Thesis:

HEALTH, SAFETY AND ENVIRONMENTAL IMPLICATIONS IN NIGERIA'S OIL AND GAS INDUSTRY

Promoter: Prof JJ Smallwood

GREYLING, Een Lance

Title of Thesis:

A SYSTEMS APPROACH TO PROJECT IMPLEMENTATION WITHIN THE PUBLIC SECTOR TOWARDS FORMULATING A FRAMEWORK FOR PROJECT EVALUATION

Promoter: Prof JJ Smallwood

KAISER, Gisela Noelle

Title of Thesis:

IMPROVING DECISION MAKING THROUGH ANALYSING THE ECONOMIC IMPACT OF BUDGET ALLOCATION AT THE CITY OF CAPE TOWN

Promoter: Prof JJ Smallwood

OZUMBA, Aghaegbuna Obinna Uche

Title of Thesis:

IMPROVING THE SITE MANAGEMENT PROCESS THROUGH INFORMATION AND COMMUNICATION TECHNOLOGY

Promoter: Prof MWW Shakantu

DOCTOR OF PHILOSOPHY IN INFORMATION TECHNOLOGY

BUTGEREIT, Laura Lee

Title of Thesis:

A MODEL FOR AUTOMATED TOPIC SPOTTING IN A MOBILE CHAT BASED MATHEMATICS TUTORING ENVIRONMENT

Promoter: Prof RA Botha

■ Faculty of Health Sciences

DOCTOR OF PHILOSOPHY

BURTON, Susan Frances

(General Health Sciences)

Title of Thesis:

SELF-PERCEIVED PROFESSIONAL IDENTITY OF PHARMACY EDUCATORS

Promoter: Prof CN Hoelson

Co-Promoter: Mrs S-A Boschmans

■ Faculty of Law

DOCTOR OF LAWS

CHITIMIRA, Howard

(Mercantile Law)

Title of Thesis:

A COMPARATIVE ANALYSIS OF THE ENFORCEMENT OF MARKET ABUSE PROVISIONS

Promoter: Prof VA Lawack

MUSUKUBILI, Felix Zingolo

(Mercantile Law)

Title of Thesis:

TOWARDS AN EFFICIENT NAMIBIAN LABOUR DISPUTE RESOLUTION SYSTEM: COMPLIANCE WITH INTERNATIONAL LABOUR STANDARDS AND A COMPARISON WITH THE SOUTH AFRICAN SYSTEM

Promoter: Prof JA van der Walt

NEL, Ebenhaéser Cornelis

(Mercantile Law)

Title of Thesis:

THE BUSINESS TRUST AND ITS ROLE AS AN ENTITY IN THE FINANCIAL ENVIRONMENT

Promoter: Prof VA Lawack

Co-Promoter: Prof JA van der Walt

TAIT, Andrew Mark

(Public Law)

Title of Thesis:

THE IMPACT OF THE CONSUMER PROTECTION ACT, 2008, ON THE ACCOMMODATION SEGMENT OF THE TOURISM INDUSTRY

Promoter: Prof PHG Vrancken

FESSAHAIE, Tesfamichael

(Environmental Geography)

Title of Thesis:

PERI-URBAN AGRICULTURE AND POPULATION GROWTH: THE CASE OF ASMARA, ERITREA

Promoter: Dr N Webb

FOSUHENE, Samuel Kofi

(Physics)

Title of Thesis:

DETECTING AND LOCATING HIGH PMD SECTIONS IN OPTICAL FIBRE LINKS USING POLARISATION OPTICAL TIME DOMAIN REFLECTOMETRIC (P-OTDR) TECHNIQUES

Promoter: Prof AWR Leitch

Faculty of Science**DOCTOR OF PHILOSOPHY****BLOUW, Langa Sunshine**

(Textile Science)

Title of Thesis:

EFFECT OF CULTIVAR ON THE QUALITY OF FLAX AND HEMP GROWN IN SOUTH AFRICA

Promoter: Prof L Hunter

Co-promoter: Dr RD Anandjiwala

DEYZEL, Herklaas Phillipus

(Zoology)

Title of Thesis:

MESO ZOOPLANKTON DYNAMICS IN A BIOGEOGRAPHICAL TRANSITION ZONE

Promoter: Prof TH Wooldridge

EASSA, Nashwa Abo Alhassan

(Physics)

Title of Thesis:

SURFACE MODIFICATION OF InAs: EFFECT OF CHEMICAL PROCESSING ON ELECTRONIC AND LUMINESCENT PROPERTIES

Promoter: Prof JR Botha

Co-promoter: Prof A Venter

FASSIHI, Ali Akbar

(Textile Science)

Title of Thesis:

THE FURTHER DEVELOPMENT, OPTIMISATION AND APPLICATION OF YARN DISMANTLER

Promoter: Prof L Hunter

Co-promoter: Dr FA Barkhuizen

GAMATHAM, Romeo Reginald Günther

(Physics)

Title of Thesis:

NON LINEAR EFFECTS WITH A FOCUS ON CROSS PHASE MODULATION AND ITS IMPACT ON WAVE LENGTH DIVISION MULTI PLEXING OPTICAL FIBRE NETWORKS

Promoter: Prof AWR Leitch

GARNER, Cornelia Johanna

(Botany)

Title of Thesis:

CHARACTERISATION AND CLASSIFICATION OF EASTERN CAPE MIXED SUBSTRATE SHORES

Promoter: Prof EE Campbell

Co-promoter: Dr DR du Preez

GUYO, Upenyu

(Chemistry)

Title of Thesis:

SYNTHESIS OF MIXEDETHER/ESTERS OF ISOPULEGOL AND EVALUATION OF THE SEAS PLASTICISERS FOR COSMETIC AND PERSONAL CARE PRODUCTS

Promoter: Prof B Zeelie

Co-promoter: Dr BH langothi

HARRIS, Linda Rozanne

(Zoology)

Title of Thesis:

AN ECOSYSTEM-BASED SPATIAL CONSERVATION PLAN FOR SOUTH AFRICAN SANDY BEACHES

Promoter: Dr R Nel

Co-promoter: Dr DS Schoeman

HLANGOTHI, Shanganyane Perceference

(Chemistry)

Title of Thesis:

STUDIES OF $\alpha\omega$ -ALKANEDITHIOL-ENE CROSS-LINKING OF HIGH VINYL 3, 4-POLYISOPRENE RUBBER

Promoter: Dr CD Woolard

HOPPE-SPEER, Sabine Clara-Lisa

(Botany)

Title of Thesis:

RESPONSE OF MANGROVES IN SOUTH AFRICA TO ANTHROPOGENIC AND ENVIRONMENTAL IMPACTS

Promoter: Prof JB Adams

JACA, Prince Senyukelo

(Mathematics)

Title of Thesis:

TOWARDS CREATING A CLASSROOM IN STRUCTIONAL ENVIRONMENT FOR PROFICIENCY IN ALGEBRA FOR RURAL SECONDARY SCHOOLS IN THE EASTERN CAPE PROVINCE

Promoter: Dr P Padayachee

Co-promoter: Dr VG Govender

KRAAIJ, Tineke

(Botany)

Title of Thesis:

THE REGIMES IN EASTERN COASTAL FYNBOS: DRIVERS, ECOLOGY AND MANAGEMENT

Promoter: Prof RM Cowling

Co-promoter: Dr BW van Wilgen

LANDMAN, Marietjie

(Zoology)

Title of Thesis:

MEGA HERBIVORES IN THICKET: RESOURCE USE AND IMPLICATIONS

Promoter: Prof GIH Kerley

LINOL, Bastien

(Geology)

Title of Thesis:

SEDIMENTOLOGY AND SEQUENCE STRATIGRAPHY OF THE CONGO AND KALAHARI BASINS OF SOUTH-CENTRAL AFRICA AND THEIR EVOLUTION DURING THE FORMATION AND BREAK-UP OF WEST GONDWANA

Promoter: Prof M de Witt

Co-promoter: Prof G Guillocheau

MAHED, Gaathier

(Geology)

Title of Thesis:

ANALYSIS OF TEMPORAL AND SPATIAL VARIATIONS IN WATER STORAGE BY MEANS OF GRAVIMETRIC AND HYDROLOGIC METHODS IN THE REGION AROUND THE SOUTH AFRICAN GRAVIMETRIC OBSERVATION STATION

Promoter: Prof M de Wit

Co-promoter: Prof M Doucouré

MOYO, Doice

(Textile Science)

Title of Thesis:

CHARACTERISATION AND OPTIMISATION OF WATERJET IMPACT FORCES AND ENERGY PARAMETERS DURING HYDROEN TANGLEMENT

Promoter: Prof R Anandjiwala

Co-promoter: Prof L Hunter

NYAMUGAMA, Adolph

(Environmental Geography)

Title of Thesis:

MONITORING CARBON STOCKS IN THE SUB TROPICAL THICKET USING REMOTE SENSING AND GIS TECHNIQUES: THE CASE OF THE DOUBLE DRIFT NATURE GAME RESERVE AND ITS ENVIRONS, EASTERN CAPE PROVINCE, SOUTH AFRICA

Promoter: Prof V Kakembo

O'CONNELL, Jacques Herman

(Physics)

Title of Thesis:

RUTHENIUM AND PALLADIUM ASSISTED SILVER TRANSPORT IN POLYCRYSTAL LINE SILICON CARBIDE

Promoter: Prof JH Neethling

ONSONGO, Francis Omweri

(Environmental Geography)

Title of Thesis:

FERTILITY DECLINE AMONG ABAGUSII WOMEN: AN APPLICATION OF AN ADAPTED PROXIMATE DETERMINANTS MODEL

Promoter: Dr N Webb

PHELAN, Richard Reginald

(Microbiology)

Title of Thesis:

MICROCYSTIN ENHANCES THE FITNESS OF MICROCYSTIN PRODUCING CYANOBACTERIA AT HIGHLIGHT INTENSITIES BY EITHER PREVENTING OR RETARDING PHOTO INHIBITION

Promoter: Dr TG Downing

POTGIETER, Kim Carey

(Chemistry)

Title of Thesis:

RHENIUM COMPLEXES WITH MULTI DENTATE BENZA ZOLATES AND RELATED N,X-DONOR (X=N,O,S) LIGANDS

Promoter: Prof TIA Gerber

PRETORIUS, Marco Cobus

(Computer Science)

Title of Thesis:

A METHODOLOGY TO INSTITUTIONALISE USER EXPERIENCE IN A SOUTH AFRICAN PROVINCIAL GOVERNMENT

Promoter: Prof AP Calitz

SHURA, Megersa Wodajo

(Physics)

Title of Thesis:

PHOTO CONDUCTIVE SPECTROSCOPY OF GaSb THIN FILMS

Promoter: Prof MC Wagener

Co-promoter: Prof JR Botha

SSEVVIIRI, David

(Mathematics)

Title of Thesis:

A CONTRIBUTION TO THE THEORY OF PRIME MODULES

Promoter: Prof NJ Groenewald

TABOT, Pascal Tabi

(Botany)

Title of Thesis:

*THE EFFECTS OF SALINITY AND INUNDATION ON SALT MARSH PLANTS IN THE
CONTEXT OF CLIMATE CHANGE*

Promoter: Prof JB Adams

URGESSA, Zelalem Nigussa

(Physics)

Title of Thesis:

*DEPOSITION AND CHARACTERISATION OF ZnO NANORODS USING CHEMICAL
BATH DEPOSITION*

Promoter: Prof JR Botha

Co-promoter: Dr OS Oluwafemi

YUMATA, Nonzaliseko Christine

(Chemistry)

Title of Thesis:

RHENIUM COMPLEXES WITH BIDENTATE N,N- AND N,O-DONOR LIGANDS

Promoter: Prof TIA Gerber

Co-promoter: Dr A Abrahams

Research Masters

■ Faculty of Arts

MASTER OF ARTS (RESEARCH)

ADAMS, Natalie

(Applied Language Studies)

Title of Dissertation:

POSSIBILITIES FOR MULTI LINGUALISM: A CRITICAL CASE STUDY WITH SELECTED FINANCIAL INFORMATION SYSTEMS (FIS) STUDENTS

Supervisor: Ms EMA Scheckle

BARNWELL, Garret Christopher

(Conflict Transformation and Management)

Title of Dissertation:

AN INVESTIGATION INTO REFUGEE TRAUMA EXPERIENCES IN AN ETHNIC SOMALI COMMUNITY IN PORT ELIZABETH, SOUTH AFRICA

Supervisor: Dr L Snodgrass

DU PLESSIS, Corne - Cum Laude

(Philosophy)

Title of Dissertation:

THE CONSTITUTION OF THE FLEXIBLE GENERAL ISTAFOUCAULTIAN AND ALTHUSSERIAN ANALYSIS OF THE BASIC EDUCATION SYSTEM OF SOUTH AFRICA

Supervisor: Prof B Olivier

GANTO, Cikizwa

(Public Administration)

Title of Dissertation:

AN EVALUATION OF THE CHILD SUPPORT GRANT AS A POVERTY ALLEVIATION STRATEGY: THE CASE OF KING WILLIAM'S TOWN CENTRE

Supervisor: Prof RS Masango

MEMANI, Ntombizonke Theodora

(Public Administration)

Title of Dissertation:

DETERMINANTS OF EFFECTIVE BASIC SERVICE DELIVERY AT AMATHOLE DISTRICT MUNICIPALITY

Supervisor: Mr S Maclean

MENZEZELE, Nomabhaca Rosamond

(Public Administration)

Title of Dissertation:

STATUTORY LOCAL GOVERNMENT STRUCTURES TO ENHANCE SERVICE DELIVERY: KOUGA LOCAL MUNICIPALITY

Supervisor: Prof JD Taylor

MINNAAR, Rae-Ann

(Applied Language Studies)

Title of Dissertation:

A SELF-REFLEXIVE INVESTIGATION INTO EFFECTIVE TRANSLATION STRATEGIES WITH SPECIAL REFERENCE TO JEANNE GOOSEN'S LOU OOND

Supervisor: Dr ML Crous

Co-Supervisor: Prof A Otto

MPEPHO, Lwandiso Arthur

(Political Studies)

MERCUSOR-SACU RELATIONS: AN EXAMINATION OF THE REVISED ECONOMIC INITIATIVE FOR SOUTH- SOUTH CO-OPERATION

Supervisor: Dr W Isaacs-Martin

NETJIES, Nomalanga Primrose - Cum Laude

(isiXhosa)

Title of Dissertation:

UPHONONONGO LOKUBUNJWA KOBUME BENGQONDO YABALINGANISWA KWIINCWADI EZIKHETHIWEYO ZESIXHOSA (AN ANALYSIS OF THE CHARACTERS' STATES OF MIND IN SELECTED ISIXHOSA TEXTS)

Supervisor: Dr LL Kwatsha

NIBISHAKA, Emmanuel

(Conflict Transformation and Management)

Title of Dissertation:

EXPROPRIATION OF MINERAL RESOURCES AND IMPLICATIONS FOR CONFLICT TRANSFORMATION IN THE DEMOCRATIC REPUBLIC OF THE CONGO

Supervisor: Dr L Snodgrass

OSHONIYI, Oluwaseun Abodunrin

(Public Administration)

Title of Dissertation:

PERCEPTIONS OF SCARE SKILLS IN THE DEPARTMENT OF INFRASTRUCTURE AND ENGINEERING AT THE NELSON MANDELA MUNICIPALITY

Supervisor: Ms EE Draai

SCOTT, Simoné

(English)

Title of Dissertation:

A STUDY OF APARTHEID LEGACIES AND IDENTITY POLITICS IN KOPANO MATLWA'S COCONUT, ZOE WICOMB'S PLAYING IN THE LIGHT AND JAQUES PAUW'S LITTLE ICE CREAM BOY

Supervisor: Prof ME West

SEHLOBOKO, Matsiliso Anastasia

(isiXhosa)

Title of Dissertation:

UPHONONONGO NZULU LWEFUTHE LWEENTETHO NTSHUKUMO ZOVAKALELO ZABALINGANISWA KWIINCWADI EZICHONGIWEYOZEDRAMA ZESIXHOSA

Supervisor: Dr LL Kwatsha

MASTER OF TECHNOLOGY: FASHION (RESEARCH)

COATES, Maran - Cum Laude

Title of Dissertation:

MODERAT'S RUSTY NAILS AND LOIEFULLER'S SERPENTINE DANCE: ANALYSING CLOTH, THE BODY AND MOVEMENT AS SYMBOLIC INTERPRETATION OF MEANING IN FILM

Supervisor: Mr BS Cadle

Co-Supervisor: Dr HM Saayman-Hattingh

MASTER OF TECHNOLOGY: GRAPHIC DESIGN (RESEARCH)

KUHN, Simon Keith

Title of Dissertation:

CRITICAL DESIGN WITHIN THE PRACTICE OF GRAPHIC DESIGN

Supervisor: Mr BS Cadle

MASTER OF TECHNOLOGY: PHOTOGRAPHY (RESEARCH)

JOUBERT, Nina - Cum Laude

Title of Dissertation:

DECODING THE NOTION OF A CONSTRUCTED IDENTITY WITHIN AN AUTOBIOGRAPHICAL PICTURE NARRATIVE WITH REFERENCE TO CONTEMPORARY PHOTOGRAPHERS, LORI NIXAND MAGGIE TAYLOR

Supervisor: Dr HM Saayman-Hattingh

KRITZINGER, Cornelius Christiaan

Title of Dissertation:

THE INTER RELATIONSHIPS BETWEEN MEANING, FORM, CINEMATIC TECHNOLOGY AND IDEOLOGY IN THE SURREALIST FILMS OF LUIS BUNUEL, UNCHIEN AND ALOU

Supervisor: Mr G Meyer

Co-Supervisor: Dr HM Saayman-Hattingh

MASTER OF TECHNOLOGY: TEXTILE DESIGN AND TECHNOLOGY (RESEARCH)

SOMI, Bongiwe Promrose

Title of Dissertation:

DESIGNING AND PRODUCING DURABLE HOME FURNISHING FABRICS WOVEN IN FANCY YARNS SPUN FROM WILD SILK FIBRES

Supervisor: Mr BS Cadle

■ Faculty of Business & Economic Sciences

MASTER OF ARTS: DEVELOPMENT STUDIES (RESEARCH)

MUKOSERA, Precious Siphon

Title of Dissertation:

THE ROLE OF FOREIGN DIRECT INVESTMENT ON SOCIO-ECONOMIC DEVELOPMENT IN SOUTH AFRICA

Supervisor: Prof R Haines

Co-supervisor: Mr I Mouchili

VAMBE, Adelaide Kudakwashe

Title of Dissertation:

AN EXAMINATION OF HEALTH CARE FINANCING MODELS: LESSONS FOR SOUTH AFRICA

Supervisor: Prof M Ocran

MASTER OF ARTS (RESEARCH)

ATTWELL, Terry-Anne Viola

(Industrial Relations)

Title of Dissertation:

AN INVESTIGATION INTO THE RELATIONSHIP BETWEEN LEADERSHIP AND COGNITIVE STYLES OF SUPERVISORY EMPLOYEES IN THE AUTOMOTIVE INDUSTRY

Supervisor: Dr GJ Louw

MASTER OF COMMERCE (RESEARCH)

ANYIKWA, Izunna Chima - Cum Laude

(Economics)

Title of Dissertation:

TRENDS AND VOLATILITY IN RESIDENTIAL PROPERTY PRICES IN SOUTH AFRICA

Supervisor: Prof M Ocran

BAILEY, Peter John - Cum Laude

(Business Management)

Title of Dissertation:

ORGANISATIONAL COMMITMENT IN AN AUTOMOTIVE INDUSTRY: A COMPARATIVE STUDY OF EMPLOYMENT CONTRACTS

Supervisor: Mrs J Krüger

Co-supervisor: Prof NE Mazibuko

BAXTER, Chad

(Economics)

Title of Dissertation:

AN ASSESSMENT OF SAVINGS ARRANGEMENTS IN SELECTED TOWNSHIPS OF THE KOUGA MUNICIPAL DISTRICT

Supervisor: Prof SG Hosking

Co-supervisor: Ms N Oosthuizen

BEUKES, Justin - Cum Laude

(Economics)

Title of Dissertation:

AN ECONOMIC ANALYSIS OF CONCENTRATOR PHOTO VOLTIC TECHNOLOGY USE IN SOUTH AFRICA: A CASE STUDY

Supervisor: Prof M du Preez

Co-supervisor: Prof EE van Dyk

GALLOWAY, Kelly Lou

(Business Management)

Title of Dissertation:

SELECTED MARKETING COMMUNICATION METHODS INFLUENCING YOUNG ADULTS' PERCEPTIONS AND BUYING INTENTIONS OF HEALTHY FOODS IN SOUTH AFRICA

Supervisor: Dr C Rootman

JACOBY, Kevin Terence - Cum Laude

(Economics)

Title of Dissertation:

THE GROWING SOUTH AFRICAN MUNICIPAL WATER SERVICE DELIVERY PROBLEM

Supervisor: Prof SG Hosking

MAGLIOLO, Jacques

(Economics)

Title of Dissertation:

THE RELEVANCE AND FAIRNESS OF THE JSE ALTXPRE-IPO SHARE PRICING METHODOLOGIES

Supervisor: Prof HR Lloyd

Co-supervisor: Dr N Bruton

MATCHABA-HOVE, Mtonhodzi Thamsanqa Michael

(Business Management)

Title of Dissertation:

THE ENTREPRENEURIAL ORIENTATION OF SMALL BUSINESSES IN THE EASTERN CAPE

Supervisor: Prof SM Farrington

NORDEN, Ryan Henri

(Economics)

Title of Dissertation:

PERSPECTIVES ON MARKET PROCESSES FOLLOWED IN SETTING SOUTH AFRICAN WATER SERVICES TARIFFS

Supervisor: Prof SG Hosking

OSSONONII, Edith Gloria

(Economics)

Title of Dissertation:

IMPACT OF ECONOMIC FREEDOM ON CEMAC COUNTRIES

Supervisor: Prof P le Roux

PHELPS, Barry Keith

(Economics)

Title of Dissertation:

FINANCIAL CONTAGION AND THE TRANSMISSION OF THE 2007 US FINANCIAL CRISIS TO SOUTH AFRICA

Supervisor: Prof M Ocran

POTGIETER, Adèle

(Business Management)

Title of Dissertation:

THE INFLUENCES OF MOTIVATIONAL FACTORS ON CORPORATE PERFORMANCE AND CUSTOMER SATISFACTION

Supervisor: Prof NE Mazibuko

Co-supervisor: Prof M Tait

SAUNDERS, Shelley Beryl - Cum Laude

(Business Management)

Title of Dissertation:

ASSESSING THE ENTREPRENEURIAL ATTRIBUTES OF UNDERGRADUATE BUSINESS STUDENTS AT NELSON MANDELA METROPOLITAN UNIVERSITY

Supervisor: Prof SM Farrington

ZEKA, Bomikazi - Cum Laude

(Business Management)

Title of Dissertation:

THE INFLUENCE OF BUSINESS SOCIAL RESPONSIBILITY ON THE BRAND IMAGE AND BUSINESS PERFORMANCE OF SMALL AND MEDIUM-SIZED ENTERPRISES

Supervisor: Dr C Rootman

MASTER OF TECHNOLOGY: BUSINESS ADMINISTRATION (RESEARCH)**BOTHMA, Tracy**

Title of Dissertation:

THE IMPACT OF CUSTOMER RELATIONSHIP MANAGEMENT ON RETAIL BANKING USING SELF-SERVICE CHANNELS

Supervisor: Prof N Kemp

MASTER OF TECHNOLOGY: ENTREPRENEURSHIP (RESEARCH)**KOUADIO, Gbogbo Nina Marie-Laure**

Title of Dissertation:

DIFFICULTIES EXPERIENCED BY SMALL BUSINESSES IN ACCESSING FINANCE

Supervisor: Prof N Kemp

KPALOU, Jean-Yves

Title of Dissertation:

DIFFICULTIES EXPERIENCED BY SMALL BUSINESS MANAGERS IN MARKETING THEIR BUSINESSES

Supervisor: Prof N Kemp

MASTER OF TECHNOLOGY: MARKETING (RESEARCH)**HALFORTY, Gail Avril**

Title of Dissertation:

CONSTRAINTS TO STUDENTS' PARTICIPATION IN SPORT ON A FORMALISED LEVEL: IMPLICATIONS FOR MARKETERS

Supervisor: Prof L Radder

THERON, Elizna - Cum Laude

Title of Dissertation:

VALUE DELIVERED BY PRIVATE GAME RESERVES IN SOUTH AFRICA: A COMPARISON OF VISITORS' AND MANAGERS' PERCEPTIONS

Supervisor: Prof L Radder

Faculty of Education**MASTER OF EDUCATION (RESEARCH)****ABADER, Naadirah**

Title of Dissertation:

TEACHING PRACTICES IN THE GRADE 10 FIRST ADDITIONAL LANGUAGE CLASSROOM: A RELEVANCE STUDY

Supervisor: Dr DC Geduld

BLAYI, Mcebisi - Cum Laude

Title of Dissertation:

THE EFFECTIVENESS OF THE INTEGRATED QUALITY MANAGEMENT SYSTEM IN IMPROVING THE PERFORMANCE OF EDUCATORS IN THE EAST LONDON DISTRICT

Supervisor: Dr L Athiemoolam

CAIN, Gerard Garth - Cum Laude

Title of Dissertation:

EDUCATORS' PERCEPTIONS OF CONFLICT AT THREE NORTHERN AREA SCHOOLS IN PORT ELIZABETH: A CASE STUDY

Supervisor: Dr A du Plessis

DAMONS, Bruce Peter

Title of Dissertation:

NAVIGATING THE PATHWAYS TO OPENING A NEW, EFFECTIVE COMMUNITY SCHOOL: A CASE STUDY IN THE NELSON MANDELA METROPOLITAN MUNICIPALITY OF SOUTH AFRICA

Supervisor: Dr A Witten

DAMONS, Thirza - Cum Laude

Title of Dissertation:

AN ANALYSIS OF TEACHERS' SKILLS IN THE IDENTIFICATION OF LEARNERS WITH BEHAVIOURAL AND EMOTIONAL PROBLEMS

Supervisor: Dr L Athiemoolam

GALLANT, Reinhold Justin

Title of Dissertation:

FOUNDATION PHASE TEACHERS' CONTINUOUS PROFESSIONAL DEVELOPMENT

Supervisor: Dr DC Geduld

GQAMANE, Gilbert Khangelani

Title of Dissertation:

INVESTIGATING GRADE 4 ESL TEACHERS' AND LEARNERS' ATTITUDES AND EXPERIENCES OF LEARNING AND TEACHING THROUGH THE MEDIUM OF ENGLISH IN PRIMARY SCHOOLS IN THE KING WILLIAM'S TOWN DISTRICT

Supervisor: Dr L Webb

LOGGENBERG, Ernest Wilfred - Cum Laude

Title of Dissertation:

TEACHING AND LEARNING ELECTRO STATICS USING INDIGENOUS KNOWLEDGE, EVERYDAY KNOWLEDGE AND SCIENTIFIC ARGUMENTATION

Supervisor: Prof P Webb

WILLIAMS, Pearl Juanita Cherrol

Title of Dissertation:

LEADERSHIP'S INFLUENCE ON THE HOLISTIC DEVELOPMENT OF LEARNERS WITH BARRIERS TO LEARNING

Supervisor: Prof JL Geldenhuys

Faculty of Engineering, the Built Environment & IT**MASTER OF ENGINEERING IN MECHATRONICS (RESEARCH)****HOCHHEUSER, Marc - Cum Laude**

Title of Dissertation:

A FULL VARIABLE VALVET RAIN MECHATRONIC CONTROL SYSTEM

Supervisor: Prof T van Niekerk

Co-supervisor: Prof U Becker

LAKHANI, Akshay

Title of Dissertation:

AN AUTOMATED-GUIDED VEHICLE WITH ROBOTIC ARMS

Supervisor: Prof IA Gorlach

Co-supervisor: Dr F Smith

SNYMAN, Christo Johannes

Title of Dissertation:

DEVELOPMENT OF A NAVIGATION SYSTEM FOR AN AUTONOMOUS GUIDED VEHICLE USING ANDROID TECHNOLOGY

Supervisor: Prof TI van Niekerk

STAHLBERG, Martin

Title of Dissertation:

ACOUSTIC MONITORING AND CONTROL SYSTEM TO DETERMINE THE PROPERTIES OF DAMPING MATERIALS

Supervisor: Prof TI van Niekerk

Co-supervisor: Prof U Becker

VAN ROOYEN, Hennie

Title of Dissertation:

INDUSTRIAL IMPLEMENTATION OF AN ARTIFICIAL NEURAL NETWORK FOR SORTING MANUFACTURED PARTS

Supervisor: Prof TI van Niekerk

MASTER OF TECHNOLOGY: ENGINEERING: MECHANICAL (RESEARCH)**BERNARD, Dreyer - Cum Laude**

Title of Dissertation:

DYNAMIC PERFORMANCE OF FRICTION STIR WELDS FOR USE AS AN INDUSTRIAL JOINING TECHNOLOGY IN THE ROAD TANKER INDUSTRY

Supervisor: Prof DG Hattingh

Co-supervisor: Mr L Von Wielligh

CHETTY, Shamalin

Title of Dissertation:

THICK SECTION FSW USING A SLIDING TOOL SHOULDER

Supervisor: Prof DG Hattingh

FIDDER, Herman

Title of Dissertation:

CHARACTERISING THE STRESS-LIFE RESPONSE OF MECHANICAL-AND LASER-FORMED TITANIUM PLATE COMPONENTS

Supervisor: Prof PJ McGrath

MULLER, Ruan

Title of Dissertation:

CHARACTERISING THE STRESS-LIFE RESPONSE OF MECHANICAL FORMED AISI-1008 STEEL PLATE COMPONENTS

Supervisor: Prof PJ McGrath

NEWEY, Kerry Brett

Title of Dissertation:

THE DEVELOPMENT OF AN OPTIMISED ROTOR SOFTWARE DESIGN TOOL TO IMPROVE THE PERFORMANCE OF SMALL HORIZONTAL AXIS WIND TURBINES

Supervisor: Dr RL Phillips

STROUD, Trevor James - Cum Laude

Title of Dissertation:

OPTIMIZATION OF VEHICLE DYNAMICS THROUGH DYNAMIC TYRE TEMPERATURE ANALYSIS

Supervisor: Mr KH du Preez

Co-supervisor: Prof TI van Niekerk

MASTER OF TECHNOLOGY: INFORMATION TECHNOLOGY (RESEARCH)**BOSHOF, Ryno**

Title of Dissertation:

A BASELINE OF INFORMATION SECURITY KNOWLEDGE FOR END USERS

Supervisor: Dr J Van Niekerk

COERTZE, Jacques Jacobus - Cum Laude

Title of Dissertation:

A FRAMEWORK FOR INFORMATION SECURITY GOVERNANCE IN SMME'S

Supervisor: Prof R von Solms

FOUCHE, Jacques

Title of Dissertation:

ELECTRONIC COMMUNICATION CONTINUITY PLANNING FROM THE PERSPECTIVE OF AN INDIVIDUAL

Supervisor: Prof R von Solms

FOUCHÉ, Nico Pieter

Title of Dissertation:

GUIDELINES FOR THE ADAPTATION OF TETRA EDUCATIONAL PROGRAMME AT THE NELSON MANDELA METROPOLITAN UNIVERSITY TO ADDRESS HUMAN BEHAVIOURAL ISSUES

Supervisor: Dr K-L Thomson

Co-supervisor: Dr J van Niekerk

FRAUENSTEIN, Edwin Donald

Title of Dissertation:

THE DEVELOPMENT OF A FRAMEWORK TO MITIGATE PHISHING THREATS

Supervisor: Prof R von Solms

Co-supervisor: Dr K-L Thomson

GERBER, Tian Johannes

Title of Dissertation:

VoIP: A CORPORATE GOVERNANCE APPROACH TO AVOID THE RISK OF CIVIL LIABILITY

Supervisor: Dr K-L Thomson

Co-supervisor: Dr M Gerber

MAKITLA, Mokone Ishmael - Cum Laude

Title of Dissertation:

A CONCEPTUAL MODEL OF AN ACCESS-TECHNOLOGY-AGNOSTIC DELIVERY MECHANISM FOR ICT4D SERVICES

Supervisor: Prof R ABotha

Co-supervisor: Prof ME Herselman

MARAIS, Jacques

Title of Dissertation:

A FRAMEWORK FOR PARENTAL CONTROL OF MOBILE DEVICES IN SOUTH AFRICA

Supervisor: Dr J van Niekerk

MASIZA, Melissa - Cum Laude

Title of Dissertation:

FACTORS AFFECTING THE ADOPTION AND MEANINGFUL USE OF ELECTRONIC MEDICAL RECORDS IN GENERAL PRACTICES

Supervisor: Mrs N Mostert-Phipps

Co-supervisor: Prof D Pottas

OKERE, Irene Onyekachi

Title of Dissertation:

A FRAMEWORK FOR THE ASSESSMENT OF INFORMATION SECURITY CULTURE

Supervisor: Dr J van Niekerk

Co-supervisor: Mrs M Carroll

REID, Rayne

Title of Dissertation:

A BRAIN-COMPATIBLE APPROACH TO THE PRESENTATION OF CYBER SECURITY EDUCATIONAL MATERIAL

Supervisor: Dr J van Niekerk

SNADDON, Jean-Paul

Title of Dissertation:

A FRAMEWORK TO ASSIST THE IMPLEMENTATION OF STRATEGIC ASPECTS RELATING TO IT GOVERNANCE

Supervisor: Dr M Gerber

Co-supervisor: Prof R von Solms

WILSON, Fiona Michelle

Title of Dissertation:

USER REQUIREMENTS FRAMEWORK FOR MOBILE GOVERNMENT IN THE WESTERN CAPE

Supervisor: Prof D van Greunen

YERATZIOTIS, George

Title of Dissertation:

GUIDELINES FOR THE DESIGN OF A MOBILE PHONE APPLICATION FOR DEAF PEOPLE

Supervisor: Prof D van Greunen

DE VILLIERS, Derika

(Psychology)

Title of Dissertation:

CULTURAL INTERPRETATIONS OF TRAUMATIC EVENTS AND PTSD SYMPTOMS OF ISIXHOSA-SPEAKING ADULTS

Supervisor: Mr K van Rooyen

Co-Supervisor: Ms PP Kota-Nyati

DU PREEZ, Devon

(Human Movement Science)

Title of Dissertation:

THE INCIDENCE AND MECHANISM OF INJURIES OCCURRING AT A SOUTH AFRICAN NATIONAL JUDO CHAMPIONSHIP

Supervisor: Prof R du Randt

Co-Supervisor: Mr D Venter

HALGREEN, Charnel - Cum Laude

(Psychology)

Title of Dissertation:

EXPLORING BEHAVIOURAL ADDICTION: A PHENOMENOLOGICAL STUDY OF THE LIVED EXPERIENCES OF PATHOLOGICAL GAMBLERS

Supervisor: Prof JG Howcroft

SANDERSON, Andrea Alexa

(Human Movement Science)

Title of Dissertation:

BODY FATNESS AND ASSOCIATED SELECTED HEALTH RISK FACTORS AMONG 10 TO 12 YEAR-OLDS IN PORT ELIZABETH SCHOOLS

Supervisor: Prof R du Randt

Co-Supervisor: Dr J Pietersen

VON DER MARWITZ, Reiner Keith

(Human Movement Science)

Title of Dissertation:

THE EFFECTS OF A GYMNASIUM-BASED RESISTANCE TRAINING PROGRAMME ON SELECTED FITNESS COMPONENTS IN SUB-ELITE MARTIAL ARTISTS

Supervisor: Dr ML Baard

■ Faculty of Health Sciences

MASTER OF ARTS (RESEARCH)

BOOYSEN, Duane Danny-Coe

(Psychology)

Title of Dissertation:

A PSYCHOBIOGRAPHY OF FRIEDRICH NIETZSCHE

Supervisor: Prof CN Hoelson

CAIRNCROSS, Joy Claudia

(Human Movement Science)

Title of Dissertation:

THE EFFECT OF 14 WEEKS OF STRENGTH TRAINING ON INSULIN RESISTANCE

Supervisor: Dr P Olivier

Co-Supervisor: Prof R du Randt

MASTER OF PHARMACY (RESEARCH)

GAIDA, Razia

Title of Dissertation:

TREATMENT OF PARKINSON'S DISEASE IN SOUTH AFRICA AND INVESTIGATION OF THE RISK FACTORS CAUSING DYSKINESIA

Supervisor: Prof I Truter

Co-Supervisor: Prof JA Carr

SMITH, Charne

Title of Dissertation:

IMPLEMENTATION OF A STANDARDISED INSULIN PROTOCOL IN A TERTIARY LEVEL REFERRAL HOSPITAL

Supervisor: Ms J McCartney

Co-Supervisor: Mrs SA Boschmans

MASTER OF SCIENCE (RESEARCH)

RAMLOLL, Jason

(General Health Sciences)

Title of Dissertation:

TECHNOLOGY TRANSFER OF AN ANTIBACTERIAL ORAL SOLID DOSAGE FORM IN A PHARMACEUTICAL INDUSTRY

Supervisor: Mrs MZ Keele

Co-Supervisors: Dr G Kilian and Mr N Jaganath

MASTER OF TECHNOLOGY: ENVIRONMENTAL HEALTH (RESEARCH)

DOHERTYBIGARA, Ana Paula Lopes

Title of Dissertation:

ENVIRONMENTAL HEALTH WORK PROCEDURES AND METHODS FOR THE SURVEILLANCE AND CONTROL OF CHOLERA IN SOUTH AFRICA

Supervisor: Dr HJ Maarschalk

■ Faculty of Law

MASTER OF LAWS (RESEARCH)

MUSHI, Walter

(Mercantile Law)

Title of Dissertation:

REGULATING CARTEL ACTIVITY IN SOUTH AFRICA

Supervisor: Mrs J Botha

Co-Supervisor: Ms L Coetzee

NNANE, Roland Etape

(Mercantile Law)

Title of Dissertation:

THE IMPACT OF MULTI MODAL FORMS OF TRANSPORT ON A CARGO CARRIER'S LIABILITY

Supervisor: Mr S Newman

PHILIMON, Levina Kiiza

(Public Law)

Title of Dissertation:

THE ESTABLISHMENT OF A REGIONAL CRIMINAL COURT IN AFRICA

Supervisor: Mr D Abrahams

■ Faculty of Science

MASTER OF COMMERCE (RESEARCH)

HOSKING, Jessica Lee - Cum Laude

(Statistics)

Title of Dissertation:

GENERATING GUIDANCE ON PUBLIC PREFERENCES FOR THE LOCATION OF WIND TURBINE FARMS IN THE EASTERN CAPE

Supervisor: Dr M du Preez

Co-supervisor: Dr DG Sharp

MASTER OF SCIENCE (RESEARCH)

AH GOO, Delia Felecia Stephanie

(Geography)

Title of Dissertation:

THE CONTRIBUTION OF THE TRADE IN INDIGENOUS MEDICINAL PLANTS TOURBAN LIVELIHOODS: A CASE STUDY OF THE INFORMAL MARKETS IN PORT ELIZABETH, SOUTH AFRICA

Supervisor: Dr A de Wit

AHAME, Edmund

(Mathematical Statistics)

Title of Dissertation:

STATISTICAL MODEL FOR RISK DIVERSIFICATION IN RENEWABLE ENERGY

Supervisor: Prof IN Litvine

ALISTOUN, Warren James

(Physics)

Title of Dissertation:

INVESTIGATION OF THE PERFORMANCE OF PHOTO VOLTAIC SYSTEMS

Supervisor: Prof EE van Dyk

Co-supervisors: Drs FJ Vorster and W Okullo

BARLOW, Sherwin Riaan - Cum Laude

(Computer Science and Information Systems)

Title of Dissertation:

USING AN INTELLIGENT SELF-SERVICE SYSTEM TO SUPPORT TELECOMMUNICATION SERVICE PROVISIONING

Supervisor: Prof JL Wesson

Co-supervisor: Dr NLO Cowley

BENECKE, Mario Andrew - Cum Laude

(Physics)

Title of Dissertation:

ON THE OPTICAL AND ELECTRICAL DESIGN OF LOW CONCENTRATOR PHOTOVOLTAIC MODULES

Supervisor: Prof EE van Dyk

Co-supervisor: Dr FJ Vorster

BRANCH, Thomas Cameron

(Geology)

Title of Dissertation:

ELECTRICAL CONDUCTIVITY EXPERIMENTS ON CARBON-RICH KAROO SHALES AND FORWARD MODELING OF AEROMAGNETIC DATA ACROSS THE BEATTIE ANOMALY

Supervisor: Prof MJ de Wit

CLEMENTS, Hayley Susan - Cum Laude

(Zoology)

Title of Dissertation:

INCORPORATING PREY DEMO GRAPHICS AND PREDATOR SOCIAL STRUCTURE INTO PREY SELECTION AND CARRYING CAPACITY ESTIMATES FOR CHEETAH

Supervisor: Prof G Kerley

Co-supervisor: Dr CJ Tambling

DE LAUWERE, Monique Simone

(Botany)

Title of Dissertation:

THE BIOTA OF THE SWARTKOPS SOLAR SALTWORKS AND THEIR POTENTIAL FOR PRODUCING BIOFUELS

Supervisor: Prof EE Campbell

DEWET, Anje

(Zoology)

Title of Dissertation:

ESTIMATING SURVIVORSHIP FOR THE SOUTH AFRICAN NESTING SEA TURTLE POPULATIONS, CARETTA CARETTA AND DERMOCHELYS CORIACEA

Supervisor: Dr R Nel

DHANSAY, Taufeeq Goolam - Cum Laude

(Geology)

Title of Dissertation:

EVALUATION FOR HARNESSING LOW-ENTHALPY GEO THERMAL ENERGY IN SOUTH AFRICA BASED ON A MODEL PILOT PLANT IN THE LIMPOPO BELT

Supervisor: Prof MJ de Wit

FERREIRA, Cornel

(Computer Science and Information Systems)

Title of Dissertation:

A DATA WAREHOUSE STRUCTURE DESIGN METHODOLOGY TO SUPPORT THE EFFICIENT AND EFFECTIVE ANALYSIS OF ONLINE RESOURCE USAGE DATA

Supervisor: Prof C Cilliers

Co-supervisor: Dr B Scholtz

GERBER, Jacques Dewald

(Physics)

Title of Dissertation:

ON THE THERMAL AND ELECTRICAL PROPERTIES OF LOW CONCENTRATOR PHOTOVOLTAIC MODULES

Supervisor: Prof EE vanDyk

Co-supervisor: Dr FJ Vorster

HANLY, Erin - Cum Laude

(Mathematical Statistics)

Title of Dissertation:

COMPOUND DISTRIBUTION MODELS FOR ATHLETICS RECORDS

Supervisor: Mr DG Friskin

Co-supervisor: Dr GD Sharp

JUDGE, Richard David Eadie

(Geography)

Title of Dissertation:

TOWARDS A METHODOLOGY FOR IDENTIFYING POTENTIAL SITES FOR CEMETARY DEVELOPMENTS

Supervisor: Dr AH de Wit

KIMONO, Diana Agnes

(Biochemistry)

Title of Dissertation:

THE PRODUCTION OF OMEGA 3 FATTY ACIDS BY MIXED MICRO ALGAE CULTURE

Supervisor: Prof S Roux

Co-supervisors: Prof B Zeelie and Dr D du Preez

MAKIN, Douglas Ferguson - Cum Laude

(Zoology)

Title of Dissertation:

HOW DOES THE UNGULATE COMMUNITY RESPOND TO PREDATION RISK FROM CHEETAH (ACINONYX JUBATUS) IN SAMARA PRIVATE GAME RESERVE?

Supervisor: Prof G Kerley

MATERECHERA, Fenji

(Geography)

Title of Dissertation:

TOWARDS INTEGRATED CATCHMENT MANAGEMENT: CHALLENGES AND OPPORTUNITIES SURROUNDING IMPLEMENTATION IN THE GAMTOOS RIVER CATCHMENT

Supervisor: Dr AH de Wit

MATTHEUS, Cherize

(Zoology)

Title of Dissertation:

BIOGEOGRAPHICAL CHARACTERISATION OF SOUTH AFRICAN ESTUARIES BASED ON EURYHALINE ZOOPLANKTON, TOGETHER WITH AN IDENTIFICATION GUIDE OF THESE SPECIES

Supervisor: Prof T Wooldridge

Co-supervisor: Dr NA Strydom

MATTHEWS, Timothy - Cum Laude

(Computer Science and Information Systems)

Title of Dissertation:

SKETCH-BASED DIGITAL STORY BOARDS FOR AUTHORIZING FILM PRE-VISUALISATIONS

Supervisor: Dr D Vogts

Co-supervisor: Mr K Naude

MGIBANTAKA, Felicia Nonkoliso

(Zoology)

Title of Dissertation:

THE DIET OF THE SUB ANTARCTIC FURSEAL (A. TROPICALIS) AND ANTARCTIC FURSEAL (A. GAZELLA) AT MARION ISLAND

Supervisor: Dr P Pistorius

Co-supervisor: Prof MN Bester

MOHAMED, Rhiyaad

(Chemistry)

Title of Dissertation:

SYNTHESIS AND CHARACTERIZATION OF Pt-ALLOY OXYGEN REDUCTION ELECTRO CATALYSTS FOR LOW TEMPERATURE PEM FUEL CELLS

Supervisor: Dr S Gouws

Co-supervisor: Prof E Ferg

NICHOLAS, Rudi Berto

(Biochemistry)

Title of Dissertation:

IN SILICO AND IN VITRO SCREENING OF MARRUBIIN AND MARRUBIIN DERIVATIVES FOR ANTIDIABETIC ACTIVITY IN C2C12, CHANGLIVER AND 3T3-L1 ADIPOCYTES

Supervisor: Prof CL Frost

Co-supervisor: Ms R Levendal

NYULU, Thandekile

(Mathematical Statistics)

Title of Dissertation:

WEATHER NEUTRAL MODELS FOR SHORT-TERM ELECTRICITY DEMAND FORECASTING

Supervisor: Prof IN Litvine

OKERIO, Jasper Mosomi

(Chemistry)

Title of Dissertation:

SYNTHESIS OF FLUORESCENT POLYMERS WITH A COUMARIN BACKBONE BY "CLICK POLYMERISATION"

Supervisor: Dr N Mama

Co-supervisor: Prof CW McClelland

O'REILLY, Bevan James

(Botany)

Title of Dissertation:

PHYTOPLANKTON ASSOCIATED WITH MESOSCALE EDDIES IN THE MOZAMBIQUE CHANNEL

Supervisor: Dr TG Bornman

Co-supervisor: Prof EE Campbell

PRUISSEN, Megan Colleen

(Microbiology)

Title of Dissertation:

EVALUATION OF PLANT EXTRACTS: ARTEMISIA AFRA AND ANNONA MURICATA FOR INHIBITORY ACTIVITIES AGAINST MYCOBACTERIUM TUBERCULOSIS AND HUMAN IMMUNODEFICIENCY VIRUS

Supervisor: Dr S Govender

Co-supervisor: Prof M van de Venter

ROUX, Maryanne

(Zoology)

Title of Dissertation:

THE DIVERSITY AND DISTRIBUTION PATTERNS OF INTERTIDAL FISH IN THE AGULHAS BIO REGION

Supervisor: Dr R Nel

Co-supervisor: Dr MJ Smale

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

SCHMITT, Bonell

(Chemistry)

Title of Dissertation:

CURCUMIN ANALOGUES AS LIGANDS FOR RHENIUM (I) AND (V)

Supervisor: Prof TIA Gerber

SMITH, Melnick Jurgen

(Mathematical Statistics)

Title of Dissertation:

A LINEAR MODEL FOR VALUATING PREFERENCES OF FRESHWATER INFLOWS INTO FORTY SELECTED ESTUARIES ALONG THE SOUTH AFRICAN COASTLINE

Supervisor: Dr J Hugo

Co-supervisor: Dr GB Sharp

THEUNISSEN, Reza

(Biochemistry)

Title of Dissertation:

AN INVESTIGATION INTO SHORT-CHAIN FATTY ACIDS AND INFLUENTIAL MICROBIOTA ASSOCIATED WITH IRRITABLE BOWEL SYNDROME

Supervisor: Prof S Roux

TWIGG, Gianni Gurshwin

(Computer Science and Information Systems)

Title of Dissertation:

USING MOBILE INFORMATION VISUALISATION TO SUPPORT TELECOMMUNICATION SERVICE UTILISATION MANAGEMENT

Supervisor: Prof JL Wesson

Co-supervisor: Dr NLO Cowley

VAN DER WALT, Rachel Jenna-Anne

(Biochemistry)

Title of Dissertation:

IDENTIFYING VOLATILE EMISSIONS ASSOCIATED WITH FALSE CODLING MOTH INFESTED CITRUS FRUIT

Supervisor: Prof V Oosthuizen

Co-supervisors: Prof B Zeelie and Dr S Moore

VAN ROOYEN, Anzel

(Biochemistry)

Title of Dissertation:

IN VITRO BIOLOGICAL ACTIVITIES OF UNDIGESTED AND DIGESTED CRUDE EXTRACTS OF HYPOXIS SIBBOLIFERA CORMS

Supervisor: Prof M van de Venter

VAN ZYL, Dwain George - Cum Laude

(Biochemistry)

Title of Dissertation:

PRODUCTION OF RECOMBINANT HUMAN CD21 AND CD23; TOWARDS A BETTER UNDERSTANDING OF THEIR INTERACTION

Supervisor: Prof V Oosthuizen

VOSLOO, Natalie

(Applied Mathematics)

Title of Dissertation:

FINITE ELEMENT ANALYSIS OF THE HEAT TRANSFER IN FRICTION STIRWELDING WITH EXPERIMENTAL VALIDATION

Supervisor: Prof JW Gonsalves

Co-supervisor: Dr H Lombard

VOSLOO, Rick

(Physics)

Title of Dissertation:

ON THE MICRO STRUCTURE AND PHYSICAL PROPERTIES OF PHOSPHORUS AND HYDROGEN IMPLANTED 6H-SiC

Supervisor: Prof JH Neethling

Co-supervisor: Prof J Engelbrecht

WALI, Nwabisa Whitney

(Chemistry)

Title of Dissertation:

SYNTHESIS OF FLUORESCENT POLYMERS WITH PENDANT TRIAZOLE-SUBSTITUTED COUMARIN SIDE- CHAINS VIA A COMBINATION OF CLICK CHEMISTRY AND RAFT-MEDIATED POLYMERISATION

Supervisor: Dr N Mama

Co-supervisor: Prof CW McClelland

WELMAN, Shaun - Cum Laude

(Zoology)

Title of Dissertation:

SEASONAL VARIATION IN THE HEAT PRODUCTION OF AN AFRICAN SMALL MAMMAL, RHABDOMYS PUMILIO

Supervisor: Dr N Mzilikazi

MASTER OF TECHNOLOGY: AGRICULTURE**OLUFAYO, Motunrayo Ayowumi**

Title of Dissertation:

THE EFFECTIVENESS OF AGRICULTURAL EXTENSION AS PERCEIVED BY SMALL SCALE FARM HOLDERS FOR THE SIYAZONDLA HOMESTEAD PRODUCTION PROGRAM IN THE NELSON MANDELA BAY METROPOLITAN AREA

Supervisor: Mr W van Heerden

Co-supervisor: Prof P van Niekerk

MASTER OF TECHNOLOGY: CHEMISTRY (RESEARCH)**DYESHANA, Vuyokazi**

Title of Dissertation:

A STUDY OF THE APPLICATIONS OF CLINOPTILOLITEANION EXCHANGE AGENT FOR SELECTED METALS IN AQUEOUS SOLUTION

Supervisor: Dr G Rubidge

Co-supervisor: Dr N Vorster

MAHANJANA, Lungelwa

Title of Dissertation:

REACTIONS TOWARDS THE SYNTHESIS OF THE UNCOMMON P57CYMAROSEMOIETY

Supervisor: Dr B Hlangothi

Co-supervisor: Dr B Barton

■ George Campus**MASTER OF SCIENCE (RESEARCH)****BECKER, Carina Helene - Cum Laude**

(Botany)

Title of Dissertation:

THE INFLUENCE OF SELECTED SOIL PROPERTIES ON SURVIVAL AND DISTRIBUTION OF PORTULACARIA AFRA

Supervisor: Dr C Coetsee

Co-Supervisor: Prof R Cowling

MASTER OF TECHNOLOGY: FORESTRY (RESEARCH)**POOL, Christiaan Frederik**

Title of Dissertation:

THE EFFECT OF MODIFIED FUEL LOADS ON FIRE BEHAVIOUR IN PINUS PATULA AND EUCALYPTUS MACARTHURII STANDS IN THE MPUMALANGA HIGHVELD FORESTRY REGION OF SOUTH AFRICA

Supervisor: Prof J Louw

Co-supervisor: Dr C Smith

RAMANTSWANA, Mufhumudzi Muedanyi - Cum Laude

Title of Dissertation:

A COMPARISON OF HARVESTER PRODUCTIVITY AND PLANTED EUCALYPTUS GRANDIS PULPWOOD COMPARTMENTS IN THE KWAZULU-NATAL FORESTRY REGION OF SOUTH AFRICA

Supervisor: Dr JC Steenkamp

Co-supervisor: Mr AM McEwan

MASTER OF TECHNOLOGY: NATURE CONSERVATION (RESEARCH)**WHYTE, Michelle**

Title of Dissertation:

SOCIAL NETWORK ANALYSIS OF STAKEHOLDERS IN THE DUIWENHOKSWATER CATCHMENT

Supervisor: Prof C Fabricius

Co-supervisor: Prof R Cowling

Patent Applications Filed in 2012

HATTINGH, D.G.; VON WIELLIGH, L.G.; PENTZ, W.G. & DOUBELL, P.

Method for repairing radially cracked hole. South African provisional patent application (2012/03293)

HATTINGH, S.D.W. Anthelmintic agent for treating birds. South African patent application (2012/03971)

PHILLIPS, R.L. Turbine arrangement. South African provisional patent application (2012/05038)

SMITH, F. A method and circuit structure for suppressing single event transients or glitches in digital electronic circuits. South African provisional patent application (2012/00683)

SMITH, F. A method and circuit structure for suppressing single event transients or glitches in digital electronic circuits. PCT Application (PCT/IB2012/055738)

VON SOLMS, R.; VAN NIEKERK, J.F. & POTGIETER, M. System and method for secure transacting. South African patent application (2012/09221)

WESSON, J.L. & VAN TONDER, B.P. Tilt interaction in mobile devices. South African patent application (2012/09158)

Exhibitions and Performances

Vice-Chancellor's Evening:

The Vice-Chancellors Evening was arranged around the theme Di-Verse, and featured readings by the poet Ankie Krog, as well as performances and readings by staff and students of the NMMU, and musical performances by the NMMU choir and students and staff of the Department of Music.

Exhibitions presented by the School:

- **Student Achievers:** Art exhibition at ArtEC, Port Elizabeth. January - February 2012
- **Conversations with the Queen:** Art exhibition of Public Sculpture created by the NMMU Sculpture Collective at Athenaeum, Port Elizabeth, January – February 2012
- **First Year Orientation Exhibition:** Art exhibition at the Quad Gallery, NMMU. February 2012
- **Benguela:** Art exhibition of works by new staff : Rachel Collett, Mellaney Ruiters, Nick Hauser, Rene Pretorius, Anva Chiazari, and Zane Lange, at Alliance Française, Port Elizabeth, February 2012
- **Absa L'Atelier Regional Art Exhibition** at the Quad Gallery, NMMU, March 2012
- **Conversations with the Queen:** Selected public sculptures by the NMMU Sculpture Collective, at the Law Colloquium, South Campus, NMMU, March - April 2012
- **Sasol New Signatures Regional:** Art exhibition at the Quad Gallery, NMMU, July 2012
- **PPC Cement Young Artist Regional Exhibition:** Art exhibition at the Quad Gallery, NMMU, August 2012
- **Animal Masks:** Launch of permanent exhibition of artworks created by Art and Design: Introductory Studies Students at the Little Theatre, Athenaeum, Port Elizabeth, September 2012
- **Sculpture Portrait Exhibition:** Art exhibition of sculpture student portraits at the Buzz Room, South Campus, supported by CANRAD and Arts and Culture. September 2012
- **Collective Graduate Student Exhibitions:** Art exhibitions presented by Applied Design and Studio Arts in the Arts Building, North Campus, NMMU, October- November 2012
- **Collective Graduate Students Fashion Shows:** Fashion Shows presented in the Goldfields Auditorium, North Campus, October 2012

External exhibitions: Staff, Students and Alumni 2012

- **ArtEC New Signatures:** OpenArt exhibition for students and emerging artists at ArtEC Gallery, Port Elizabeth, March 2012
- **Easter Cathedral:** Invited Art exhibition at ArtEC Gallery, Port Elizabeth (David Jones, Andrieta Wentzel), April 2012
- **Printmakers and Painters:** Invited art exhibition at the William Humphries National Art Gallery, Kimberley, (Ethna Frankenfeld, Thys Cilliers, Amanda Snyman) April 2012
- **Expressions 2012:** Invited Art exhibition, (Thys Cilliers, Mary Duker, David Jones, Andrieta Wentzel), ART Gallery, Port Elizabeth, June 2012
- **Expressions 2012:** Invited Art Exhibition at the National Arts Festival Trinity Hall, Grahamstown (Thys Cilliers, Mary Duker, David Jones, Andrieta Wentzel) July 2012
- **Absa L'Atelier National Competition Exhibition:** Student finalists at ABSA Gallery Johannesburg, July 2012
- **Department of Arts and Culture Fine Art Exhibition:** Art exhibition at the National Arts Festival, at the 1820 Settlers Monument, Grahamstown (Siya Ngaki, Bamanye Ngxale, Lungiswa Gqunta), July 2012
- **Mandela Day Art Exhibition:** at the Nelson Mandela Metropolitan Art Museum, Port Elizabeth, (Andrieta Wentzel) July 2012
- **"Collective 1":** Art exhibition at ART Gallery, Cuyler Street, Port Elizabeth (Thys Cilliers, Mary Duker, David Jones, Andrieta Wentzel) July 2012
- **Heritage Exhibition:** Art exhibition at ArtEC, (Andrieta Wentzel) September 2012
- **Ceramics SA, Regional Exhibition:** Art Exhibition at NMMAM, Port Elizabeth
- **"In Praise of Vessels" Exhibition:** Ceramics South African Art Exhibition at Nelson Mandela Art Museum, Port Elizabeth.
- **Ceramics SA, National Ceramic Exhibition:** at Pretoria Art Museum

Publications

■ Faculty of Arts

DHET Accredited Journal Articles

AYLIFF, D. 2012. Little learning, less grammar: Observations on curriculum for English as a first additional language. *Per Linguam*, 28(1), pp. 49-58.

BOGOPA, D.L. 2012. The importance of indigenous games: The selected cases of indigenous games in South Africa. *Indilinga: African Journal of Indigenous Knowledge Systems*, 11(2), pp. 245-255.

BOWER, R. 2012. Experience, authority and tradition in the making and playing of classical guitars: a hermeneutic interpretation. *Acta Academica*, 44(2), pp. 1-20.

BOTHA, M. 2012. "ek het n liggaam, daarom is ek": Outobiografiese element in Antjie Krog se *Verweerskrif*. *LitNet Akademies*, 9(2), pp. 354-391.

CROUS, M. 2012. Eben Venter as gewete van die vleisetters. *Journal of Literary Studies*, 28(1), pp. 69-79.

DRAAI, E. 2012. Citizen perception of service quality: An exploration of client satisfaction of service levels within selected national departments in South Africa. *Journal of Public Administration*, 47(2), pp. 486-499.

DRAAI, E. & RAGA, K. 2012. Quality Public Services. A South African Citizen Perspective. *Africa Insight*, 42(2), pp. 184-199.

ECONOMOU, I. 2012. Sexualised, objectified and "branded" bodies: The media and South Africa's youth. *South African Journal of Art History*, 27(2), pp. 39-61.

HURST, A. 2012. On the Meaning of Being Real: Fantasy and "the Real" in Personal Identity-Formation. *South African Journal of Philosophy*, 31(2), pp. 278-289.

ISAACS-MARTIN, W. 2012. National Identity and Distinctiveness. Developing a Common Identity in a Nation State (with References to South Africa). *Africa Insight*, 42(2), pp. 169-183.

ISAACS-MARTIN, W. 2012. Cultural idiosyncrasies and religion: Why it is difficult to implement the third Millennium Development Goal. *Agenda: Durban*, 26(1), pp. 81-90.

KLOS, M. 2012. Endorsing cultural relevance whilst scaffolding academic literacies in a particular English for Pharmacy course. *Journal for Language Teaching*, 46(1), pp. 75-87.

KONIK, A. 2012. The tortured human body: the politico-aesthetic significance of ritualistic martyrdom in Kim Ki-duk's Spring, Summer, Autumn, Winter.....and Spring (2003). *South African Journal of Art History*, 27(2), pp. 98-129.

MANONA, W.W. & GQIRANA, X.N. 2012. An empirical assessment of the quality of health care at Dora Ngizwa Hospital in Port Elizabeth. *Administratio Publica*, 20(2), pp. 89-113.

MASANGO, R.S. & MFENE, P.N. 2012. Citizen empowerment for promoting access to public services. *Administratio Publica*, 20(1), pp. 73-89.

MOORHOUSE, L. & CUNNINGHAM, P. 2012. "We are Purified by Fire": The Complexification of Motherhood in the Context of Migration. *Journal of Intercultural Studies*, 33(5), pp. 493-508.

NOTSHULWANA, V. 2012. Rehabilitation of Youth Offenders in South Africa. *Africa Insight*, 41(4), pp. 139-158.

OLIVIER, B. 2012. Worldviews: A blessing or a curse? *KOERS*, 77(1), pp. 1-8.

OLIVIER, B. 2012. Cyberspace, simulation, artificial intelligence, affectionate machines and being human. *Communicatio*, 38(3), pp. 261-278.

OLIVIER, B. 2012. Poststrukturealisme en die betekenis van "Tahrirplein" vir politieke subjektiwiteit. *Tydskrif vir Geesteswetenskappe*, 52(2), pp. 161-173.

OLIVIER, B. 2012. Different "percepts" of the human body in cinema. *South African Journal of Art History*, 27(2), pp. 79-97.

OLIVIER, B. 2012. When the "Law" no longer suffices: Dexter. *South African Journal of Art History*, 27(3), pp. 52-67.

OLIVIER, B. 2012. The Pleasure of Food, and the Spiritual: *Eat, Pray, Love and Babette's Feast*. *Journal of Literary Studies*, 28(1), pp. 21-39.

OLIVIER, B. 2012. Heidegger, Plato, Freud, Nietzsche, the "soul" and the question of human finitude. *Phronimon*, 13(1), pp. 77-98.

OTTO, A.N. & BOSMAN, N. 2012. Die hantering van newesikkers en ondersikkers in Afrikaanse woordeboeke. *Lexikos*, 22(1), pp. 69-85.

OTTO, A.N. 2012. Veelkantiger Afrikaans: Streeksvariëteite in die standaardvorming. *Southern African Linguistics and Applied Language Studies*, 30(3), pp. 429-431.

PETRUS, T. & ISAACS-MARTIN, W. 2012. The Multiple Meanings of Coloured Identity in South Africa. *Africa Insight*, 42(1), pp. 87-102.

PREISENDÖRFER, P.; BITZ, A. & BEZUIDENHOUT, F.J. 2012. Business start-ups and their prospects of success in South African townships. *South African Review of Sociology*, 43(3), pp. 1-21.

RAGA, K.; TAYLOR, J.D. & JUMBA, R.J. 2012. Decentralisation and service delivery. Human resource issues in Wakiso and Nakaseke districts of Uganda. *African Journal of Public Affairs*, 5(2), pp. 117-129.

RAGA, K.; TAYLOR, J.D. & GOGI, A. 2012. Community development workers (CDWs): a case study of the Bitou Local Municipality. *The Journal for Transdisciplinary Research in Southern Africa*, (8)2, pp. 235-251.

SNODGRASS, L. & MENSAH, D. 2012. Seeking Sustainable Solutions in Protracted Refugee Situations: The Case of Krisan Refugee Camp, Ghana. *Africa Insight*, 42(1), pp. 13-29.

STOLTZ, W. & CROUS, M. 2012. "Oormonnementepraat": Die Campanile in Port Elizabeth. *Tydskrif vir Letterkunde*, 49(2), pp. 51-59.

TERBLANCHE, H.O. 2012. Amsterdam as 'n anti-apartheidstad. *Historia*, 57(2), pp. 150-181.

WRIGHT, B. 2012. Perceptions of adverging as an advertising tool in South Africa. *Communitas*, 17, pp. 141-161.

PETRUS, T. 2012. Critical issues regarding the victims of witchcraft-related crime in South Africa. *Acta Criminologica*, 25(1), pp. 29-40.

HORN, G.S. & RAGA, K. 2012. Municipal supply chain management. *Administratio Publica*, 20(3), pp. 71-91.

STEYN KOTZE, J. 2012. Non-racialism, nation-building and democratic consolidation in South Africa. *Politeia*, 31(2), pp. 89-108.

JOUBERT, N. & SAAYMAN HATTINGH, H. 2012. The female figure as a representational character within the autobiographical picture narrative. *South African Journal of Art History*, 27(2), pp. 182-192.

Chapters in Books submitted to DHET for subsidy purposes

WOZNIAK, J. 2012. Bafana Bafana und die Springboks - Politische Diskurse um zwei Nationalmannschaften im Sowetan in: VON MALTZAN, C. & SIMO, D. *Sport, Spiel und Leidenschaft*. Wilhelm Fink Verlag: Paderborn, Germany.

OLIVIER, B. 2012. Violent crime in post-apartheid South Africa in: GÜLERCE, A. *Re(con)figuring psychoanalysis – critical juxtapositions of the philosophical, the sociohistorical and the political*. Palgrave Macmillan: New York, USA.

Conference Proceedings submitted to DHET for subsidy purposes

DE VILLIERS, A. Can we deliver inclusivity in Music? 16th Biennial International Seminar Commission on Music Policy: Culture, Education, and Media: Athens, Greece, 13 – 16 July 2012.

■ Faculty of Business and Economic Sciences

DHET Accredited Journal Articles

ADENDORFF, C.; EMUZE, F. & KHULU, V. 2012. Investigating an effective supply chain for a refinery in a regulated petroleum sector. *The Journal for Transdisciplinary Research in Southern Africa*, 8(2), pp. 189-199.

ADENUTSI, D.E.; AZIAKPONO, M.J. & OCRAN, M.K. 2012. Macroeconomic environment and remittances in post-independent Sub-Saharan Africa: Magnitudes, trends and stylised facts. *Journal for Studies in Economics and Econometrics*, 36(2), pp. 1-22.

BURGESS, S. 2012. Contemporary challenges and future prospects of marketing research for earning a seat in decision-maker and practitioner's perspective. *International Journal of Market Research*, 54(3), pp. 435-438.

CHIKOKO, L. & LE ROUX, P. 2012. Zimbabwe commercial banks liquidity management in the hyperinflation environment. *African Journal of Business Management*, 6(48), pp. 11787-11796.

CLAEYÉ, F. 2012. Contextualising non-profit management in Sub-Saharan Africa. *African Journal of Economic and Management Studies*, 3(2), pp. 159-183.

DAYAN, O. & ARNOLDS, C. A. 2012. The influence of new product launching strategies on CRM success: An exploratory study. *Management Dynamics*, 21(1), pp. 2-17.

DU PREEZ, M.; DICKEN, M. & HOSKING, S.G. 2012. The value of Tiger shark diving within the Aliwal Shoal Marine Protected Area: A travel cost analysis. *South African Journal of Economics*, 80(3), pp. 387-399.

DU PREEZ, M.; LEE, D. & CLOETE, L. 2012. Valuing preferences for the removal of a disamenity from the Port Elizabeth harbor. *Journal of Economic and Financial Sciences*, 5(2), pp. 373-389.

DU PREEZ, M. & SALE, M.C. 2012. Determining the impact of a low-cost housing development on nearby property prices using discrete choice analysis. *Journal for Studies in Economics and Econometrics*, 36(2), pp. 23-35.

DU PREEZ, M.; MENZIES, G.; SALE, M. & HOSKING, S. 2012. Measuring the indirect costs associated with the establishment of a wind farm: An application of the contingent valuation method. *Journal of Energy in Southern Africa*, 23(1), pp. 2-7.

FARRINGTON, S.M. 2012. Personality and job satisfaction: A small-business owner perspective. *Management Dynamics*, 21(2), pp. 2-15.

FARRINGTON, S.; GRAY, B. & SHARP, G. 2012. The influence of gender and ethnicity on the perceptions of an entrepreneurial career in the South African context. *Southern African Journal of Entrepreneurship and Small Business Management*, 5(118), pp. 1-23.

FARRINGTON, S.M.; VENTER, D.J.L. & NEETHLING, A. 2012. Entrepreneurial attributes and intentions: Perceptions of South African business science students. *Management Dynamics*, 21(3), pp. 17-32.

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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.
 - 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.
 - 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.
 - 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 2012, a total of 133 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
- 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)
- Copyright (advice on copyright issues)

The following tools and resources are and will also be provided:

- Access to electronic information resources
- Unmediated service
- Virtual training materials



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