## RESEARCH AND INNOVATION REPORT 2012





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## REPORT

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## FOREWORD



Prof. HJ de Jager – DVC: Academic

The year 2012 was an exceptional year for the academic portfolio in as far as the alignment of the academic project and our research programmes with Vision 2020 is concerned. In accordance with our Vision, we have "focused strongly on producing quality social and technological innovations in socio-economic developments, primarily in the central region of South Africa".

Grounded in our commitment to innovation and interdisciplinary research, we provide students with a rich educational experience that marries intellectual rigor and cross-disciplinary breadth in an intimate, studentcentred environment. The new research structure that makes provision for faculty research managers was approved by Senate in 2012 and will be implemented in 2013. One of the highlights of 2012 was most certainly the official opening of the world-class Centre for Rapid Prototyping and Manufacturing (CRPM).

The importance of innovation and incubation is evident through a number of activities and incubation programmes embarked upon in the university's CRPM, Product Development Technology Station (PDTS) and Fablab. PDTS, funded by the Technology Innovation Agency (TIA), assisted hundreds of SMMEs during 2012 in becoming globally competitive by providing them with the technological support they required to design and manufacture innovative new products. One project with a more social impact was the successful design and manufacturing of keyboard covers for Tswellang School to assist disabled children with typing on computer keyboards.

CUT will continue to produce quality post-graduates and technological and social innovations whilst analysing complex problems, exploring new territories and establishing new knowledge in the quest to meet the needs of the region, the province and our country. I wish to express my sincere gratitude towards our Research Office, students and dedicated staff who all worked tirelessly during 2012 to achieve and even exceed the set targets. It is an ongoing privilege to create a pathway dedicated to preparing young minds and future leaders who will be able to lead the world of tomorrow!

The year 2013 will proceed from the foundations we have built in Vision 2020, strategic plans, our Academic Plan and the Research and Development Plan. Having reached a tipping point in our journey of building a stronger, focused, engaged and innovative institution, it is now time to hit the ground running. The stage has been set for a take-off and the implementation of the outcomes of the various projects and processes relevant to the research and innovation academic project.

CUT is playing the leading role in establishing a Regional Innovation Forum (RIF) and developing a Regional Innovation Strategy, in collaboration with a number of roleplayers, including the DST and UFS, aiming to contribute to regional and socio-economic development. The Sustainability Project, launched in 2012, will be further enhanced during 2013, and will echo CUT's response to global challenges. This project is done in collaboration with the Aalen University of Applied Sciences in Germany. We have also extended the activities of the Research, Technology & Innovation Sections to our Welkom campus in order to enhance the research activities at the campus and to contribute to socio-economic development in the region.

It is clear from the above that CUT is, indeed, 'a cut above' and 'at the cutting edge of social and technological innovation'. During 2013 we will continue to position CUT as the leading university of technology in South Africa and beyond!

Henk de Jager 19 November 2013



Research and Development Workshop



Prof. A Shumba (late) – Research Professor. Prof. D Kokt – Research Professor. Prof. LOK Lategan – Dean: Research and Innovation. Dr C Botha – Director: HICD (NRF). Prof. D Umesiobi – Head of Department: Agriculture

### Major highlights from the 2012 research activities

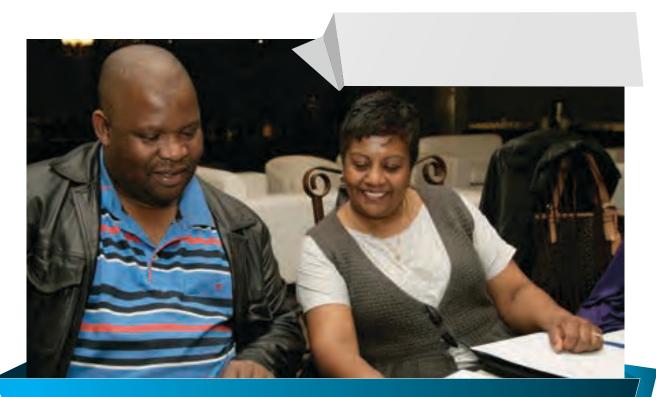
This report reflects on the annual Research and Innovation activities of the units in Research and Innovation namely Research and Development, Technology and Innovation, and research activities performed by the various faculties at the University. In the reporting period some notable achievements can be highlighted.

• A large number of staff and students are involved in and benefit from the academic support provided by these sections.

- Existing and new initiatives have attracted CUT staff and students and involve national and international partners.
- In all activities the emphasis is laid on the curriculum (now known as the STEPS process) and on how staff and students can benefit from a connected curriculum (academic capitalism).
- In line with Vision 2020 the academic focus has shifted to one in which *process* should lead to *outcome* and *impact*, and that *impact* should be measured. This will be a continuous process.



Research and Development Workshop – Facilitator: Prof. LOK Lategan



Mr Molefi Motsoeneng – Technical Officer: Science Park. Ms J Munsamy – Manager: Community Engagement



## **REPORT** FROM THE OFFICE OF RESEARCH AND DEVELOPMENT

Prof. LOK **Lategan** Dean: Research and Innovation

### **IINSTITUTIONAL PRIORITIES**

The research and development strategy of the Central University of Technology, Free State emphasises four key goals:

- The development of a sustained, relevant and responsive research culture.
- The qualitative and quantitative improvement of research outputs.
- Socio-economic development through transfer and innovation.
- The development of strategic research and innovation partners and programmes.

Based on these four key goals, the following challenges were identified for research and innovation during the period 2011-2013:

- Translate Vision 2020 into the research and innovation activities of the university (emphasis on research, innovation, outcome, impact, socio-economic development and sustainable development);
- Integrate research, teaching and engagement;
- Grow more research participation, outputs and funding (on the basis of the research clusters);
- Grow university and triple helix partnerships;
- Transfer and innovation activities;
- The internationalisation of research;
- Grow the next generation of researchers. The internationalisation of research; and
- Grow the next generation of researchers.

### BASIS FOR RESEARCH PARTICIPATION AND PRODUCTIVITY

In acknowledging the research cycle and the execution of the research assignment as core university values, the following categories for research participation and productivity have been identified:

- Study towards highest qualification in field of study
- Participation in research training
- Publication writing
- Conference presentations
- Postgraduate supervision
- Research grants
- Professional research engagement (editorial boards, review panels, assessment panels, etc.)
- Transfer and innovation

These categories concentrate on (i) research skills development and (ii) creating an enabling research environment. These outcomes are integrated into four leading principles articulated in Vision 2020. These principles are sustainable development, socio-economic development, input leading to outcomes, and outcomes leading to impact. The following research clusters, programmes and foci serve as platform for the research and innovation activities. The Central Research Committee identified 15 strategic research programmes to facilitate research and innovation. Benchmarks for strategic research programmes are the number of postgraduate students enrolled and graduated, postdoctoral fellows, amount of external funding awarded to the programme, number of active researchers, rated researchers, research publications (books, articles, published conference proceedings and reports) and commercial work. These programmes were integrated into three research clusters.



(L) to (R ) Ms S van Heerden (Research Officer), Ms Z Louw (Research Officer), Prof. LOK Lategan. (Dean: Research and Innovation), Ms R Dessels (Research Officer), Dr M Mostafa (Researcher), Dr D Das. (Researcher)

#### Table 1: Research clusters and programmes

| CLUSTER  | PROGRAMMES  |
|--|---|
| Industrial design,<br>communication<br>and development | New product development and design<br>Evolvable manufacturing, automation and vision systems<br>Sustainable engineering<br>Energy management<br>Water resource management<br>Information and communication technology |
| Quality of health<br>and living                        | Applied food safety and biotechnology<br>Sustainable farming systems<br>Applied health technology<br>Environmental assessment and management<br>Biotechnology   |
| People and<br>skills development                       | Socio-economic development studies<br>Leisure management<br>Education (sub-themes: health science education, general education, service learning, vocational pedagogy).<br>Research education                         |

Based on this approach, the following plan will facilitate the development of research and innovation:

 Table 2: Research and Development Plan, 2011-2013

| Focus  | Objective   | Activity   |
|--|---|--|
| Scholarly development through research and innovation training | Scholarly engagement with the research process and research cycle   | Predoctoral training<br>Doctoral training<br>Postdoctoral training<br>Programme on postgraduate supervision<br>Programme on scientific writing<br>Programme on technology transfer and innovation<br>Annual faculty research seminars<br>Colloquiums and discussion groups                                       |
| Research partnership<br>development                            | Capacity growth of research projects  | Multi-, inter- and trans-disciplinary research<br>Joint ventures with national and international universities,<br>research bodies and research councils<br>Joint ventures with government/business/industry  |
| Development of research clusters and programmes.               | Strengthening of research capacity.   | Student retention and throughput.<br>Publications<br>Conference attendance<br>Patents<br>Rated researchers<br>Research funding   |
| Development of technology<br>transfer and innovation.          | To develop the institutional level of<br>involvement and expertise in technology<br>transfer and innovation | IP Act of 2008 and technology transfer office training<br>Training of staff and students in innovation cycle<br>Identification of research outputs for possible innovation<br>Studying sustainable technological development<br>Supporting the community in efforts at innovation and new<br>product development |

The four faculties of the university committed themselves to the following outputs, based on their capacity to address the growth in their research outputs over a three-year period (*sustainability approach*). The understanding is that these will be the minimum outputs to which the faculties commit themselves.

The strategies identified are directed at addressing the expected normative research output shortfall and will represent growth in the research outputs. The following table reflects the consolidated research commitments of the faculties:

| Table 3: | Consolidated | commitments | from | faculties |
|----------|--------------|-------------|------|-----------|
|          | for 2012     |             |      |           |

| Category                                  | Output      |
|---|-------------|
| Accredited articles - credit output units | 50          |
| Papers read at South African conferences  | 55          |
| Papers read at international conferences  | 36          |
| Patents                                   | 1           |
| Technical reports                         | 20          |
| Staff with M degrees                      | 102         |
| Staff with D degrees                      | 73          |
| Students enrolled for M degrees           | 184         |
| Students enrolled for D degrees           | 70          |
| Postdoctoral fellows                      | 4           |
| Completed M degrees                       | 33          |
| Completed D degrees                       | 8           |
| Research focus areas                      | 18          |
| Full-time researchers                     | 9           |
| Rated researchers                         | 6           |
| Partnerships                              | 28          |
| Amount of external funding                | R 3 920 000 |

## PROGRESS ON OUTCOMES

The following progress was made during 2012:

| Focus   | Activity   | Progress   |  |
|---|--|--|--|
| Scholarly<br>development<br>through<br>research and<br>innovation<br>Training | Predoctoral training<br>Doctoral Training<br>Postdoctoral training<br>Programme on postgraduate<br>supervision<br>Programme on scientific writing<br>Programme on technology<br>transfer and innovation<br>Annual faculty<br>research seminars<br>Colloquiums and<br>discussion groups | <ul> <li>The following workshops were presented:</li> <li>23 March – The research process (22 people)</li> <li>18 May Research skills (51 people)</li> <li>29 May – Skills for research in association with SARIMA (41 people)</li> <li>6 June – Thuthuka funding application (24 people)</li> <li>26 July 2012 – DAAD programme (14 persons)</li> <li>15 August 2012 – DST &amp; NRF visit (16 persons)</li> <li>16 August 2012 – NRF courtesy visit (14 persons)</li> <li>24 August 2012 – R &amp; D workshop: How to write for publication (21 persons)</li> <li>17 September 2012 – WRC visit (organized by Y Woyessa) (5 persons)</li> <li>16 October – NRF on applications and feedback (7 people)</li> <li>19 October – The importance of research ethics and academic integrity (11 people)</li> <li>In total 11 workshops were presented and 189 staff and students attended. The SARIMA workshop was hosted for national participants, hence the attendance is not reflected in this table.</li> </ul> |  |
| Research<br>partnership<br>development  | Multi-, inter- and trans-<br>disciplinary research.<br>Joint ventures with national<br>and international universities,<br>research bodies and<br>research councils.<br>Joint ventures with<br>government/business/industry   | Collaboration with SU, UCT, CPUT, UFS, TUT, NMMU. Projects on food security and safety, machine vision, research education, medical product development.<br>CUT partners with UFS in Medical Ethical Committee. Preliminary discussions with UFS on collaboration in Animal Ethics Committee.<br>Collaborations with international universities [Aalen, Ulm, Charitre, (Germany) Loughborough, Wales (UK), IUPUI (USA), Kugari Institute of S & T (Rwanda)] on projects on food security and safety, machine vision, management, research education, medical product development.  |  |
| Development<br>of research<br>clusters and<br>programmes                      | Student retention and<br>throughput<br>Publications<br>Conference attendance<br>Patents<br>Rated researchers<br>Research funding   | For the reporting period the following progress can be reported:<br>191 M and 82 D degree students registered<br>74 articles published with a credit output value of 52 credit output units<br>54 national and 41 international conference papers<br>Seven NRF-rated researchers<br>Academic staff with M degrees: 10. Staff with D degrees: 70<br>R 5 271 400 external research funding available   |  |
| Scientific<br>programme<br>development  | Develop new theoretical<br>perspectives in science   | As part of the STEPS process, multi-, interdisciplinary and trans-disciplinary research methodologies and practices are currently being developed.   |  |

The next table indicates the progress made with the awarding of external research grants:

#### Table 6: External research funding

| Grant agency                                    | Award       |
|---|-------------|
| NRF: Thuthuka                                   | R 166 000   |
| NRF: IRDP                                       | R 419 000   |
| NRF BTech/ Honours innovation block grant (SET) | R 1 260 000 |
| NRF BTech/ Honours block grant                  | R 120 000   |
| NRF Honours Scarce Skills                       | R 1 190 000 |
| MTech: block grant                              | R 280 000   |
| NRF Incentive funding for rated researchers     | R 220 000   |
| SANHARP   | R 136 000   |
| NRF Post Docs                                   | R 390 000   |
| NRF CSUR  | R 355 400   |
| NRF Y-rated researchers                         | R 150 000   |
| NRF free-standing Master's in Scarce Skills     | R 60 000    |
| NRF/SAASTA                                      | R 69 996    |
| NRF/Knowledge fields development                | R 100 000   |
| THRIP Postgraduate bursary programme            | R 80 000    |
| ARC   | R 100 000   |
| DAFF  | R100 000    |
| PA and Alize Malan Trust                        | R 75 000    |
| Total:  | R 5 271 400 |

The next table indicates the progress made with the awarding of internal research grants:

The following awards were made to staff and students for their research projects:

| Table 7: Total re | esearch and | development | grant awards |
|-------------------|-------------|-------------|--------------|
|-------------------|-------------|-------------|--------------|

| Category                         | Number of people supported | Total awarded |
|----------------------------------|----------------------------|---------------|
| Master's degree awards           | 48                         | R1 093 342    |
| Doctoral degree awards           | 24                         | R 698 950     |
| Postdoctoral fellows             | 6                          | R 937 000     |
| Staff projects                   | 4                          | R 368 741     |
| Equipment                        | 3                          | R 330 990     |
| Supplementation: Thuthuka        | 2                          | R 140 000     |
| Supplementation: IRDP            | 3                          | R 333 333     |
| Supplementation: NRF researchers | 1                          | R 20 000      |
| Total                            |                            | R 3 922 356   |

The next table is a summary of the performance of the faculties against the set research targets for 2012:



|   | Engi<br>& Info | aculty<br>neering<br>ormation<br>mology | Enviro    | / Health &<br>onmental<br>ience |           | ulty<br>anities | Manag     | ulty<br>Jement<br>ence |                    | Total          | Report      |
|---|----------------|---|-----------|---------------------------------|-----------|-----------------|-----------|------------------------|--------------------|----------------|-------------|
|   | Committed      | Progress                                | Committed | Progress                        | Committed | Progress        | Committed | Progress               | Total<br>Committed | Total Progress | Performance |
| ltem  |                |   |           |                                 |           |                 |           |                        |                    |                |             |
| Accredited article credit units   | 10             | 4.48                                    | 14        | 11.65                           | 12        | 25.57           | 14        | 13.66                  | 50                 | 55.36          | >100%       |
| Papers read at SA<br>conferences (1 <sup>st</sup> author)               |                |   | 20        | 20                              | 15        | 9               | 15        | 19                     | 55                 | 54             | 98%         |
| Papers read at<br>international<br>conferences (1 <sup>st</sup> author) |                |   | 11        | 14                              | 10        | 10              |           | 9                      | 36                 | 42             | >100%       |
| Patents (1 <sup>st</sup> inventor)                                      |                | 0                                       | 0         | 0                               | 0         | 0               | 0         | 0                      | 1                  | 0              |             |
| Staff with M degrees  | 43             | 33                                      | 18        | 14                              | 22        | 27              | 19        | 30                     | 102                | 104            | >100%       |
| Staff with D degrees  | 14             | 13                                      | 19        | 19                              | 21        | 20              | 19        | 18                     | 73                 | 70             | 95.9%       |
| Students enrolled for<br>M degrees                                      |                | 37                                      | 67        | 61                              | 40        | 51              | 38        | 42                     | 184                | 191            | >100%       |
| Students enrolled for<br>D degrees                                      |                | 10                                      | 12        | 12                              | 26        | 37              | 25        | 23                     | 70                 | 82             | >100%       |
| Postdoctoral  | 0              | 0                                       |           |                                 | 0         | 0               |           |                        | 4                  | 4              | 100%        |
| Completed M degrees   |                |   | 11        | 14                              |           | 14              |           | 5                      | 33                 | 36             | >100%       |
| Completed D degrees   |                |   |           |                                 |           | 1               | 3         | 2                      | 8                  | 6              | 75%         |
| Rated researchers   | 0              | 0                                       |           |                                 | 2         | 2               |           | 1                      | 6                  | 7              | >100%       |
| External funding<br>(excluding student<br>grants & block grants)        | R 3m           | R332 000                                | R1.1m     | R947 000                        | R500 000  | R130 000        | R300 000  | R199 000               |                    | R1 608 000     |             |
| External: MRC   |                | 0                                       |           | 0                               |           | 0               |           | 0                      |                    | 0              |             |
| External: ARC   |                | 0                                       |           | R100 000                        |           | 0               |           | 0                      |                    | R100 000       |             |
| External: Other   |                |   |           |                                 |           |                 |           |                        |                    |                |             |
| NRF block grants  |                |   |           |                                 |           |                 |           |                        |                    | R3 179 996     |             |
| PA Malan Trust  |                |   |           |                                 |           |                 |           |                        |                    | R75 000        |             |

The following research publications were produced during 2012:

| Journal<br>no | Year of<br>publication | Volume and<br>issue no | Title of journal                                   | ISSN                 | Article title   | *CESM<br>Cat | 1st author      | 2 <sup>nd</sup> author | All other<br>authors                | Prop of<br>authors | Units<br>claimed |
|---------------|------------------------|------------------------|--|----------------------|---|--------------|-----------------|------------------------|-------------------------------------|--------------------|------------------|
|               | 2012                   | 6(1)                   | African Journal of<br>Business Management          | 3274-3281            | Quality assurance policy frameworks and mechanisms in former technikons   | 64           | Selesho JM      | Imenda SN              |                                     | 0.50               | 0.50             |
| J2            | 2012                   | 6(9)                   | African Journal of<br>Business Management          | 3274-3281            | The impact of management indecisiveness on employee motivation and performance  | 64           | Naong MN        |                        |                                     | 1.00               | 1.00             |
| J3            | 2012                   | 6(15)                  | African Journal of<br>Microbiology Research        | 1996-0808            | Detection of Salmonella, Clostridium perfringens and Escherichia coli from faecal samples of captive animals at the National Zoological Gardens of South Africa           | 13           | Mtshali K       | Mtshali MS             | Nkhebenyane<br>JS<br>Thekisoe OMM   | 0.25               | 0.25             |
| J4            | 2012                   | 6(1)                   | African Journal of Microbiology<br>Research        | 1996-0808            | Antibiotic susceptibility of bacterial pathogens isolated from food preparation areas in hospice kitchens   | 10           | Nkhebenyane J   | Theron MM              | Venter P Lues<br>JFR                | 0.25               | 1.00             |
| J5            | 2012                   | 9(32)                  | African Journal of<br>Microbiology Research        | 1996-0808            | The influence of food preservation methods on <i>Escherichia</i> coli, Salmonella enteritidis and<br>Pseudomonas aeruginosa lipopolysaccharide composition and liberation |              | Abraham M       | Venter P               | Lues JFR<br>Ivanov I, De<br>Smidt O | 0.2<br>Ivanov, I   | 1.00             |
| ðſ            | 2012                   | 12                     | FEMS Yeast Research                                | 1567-1364            | Molecular and physiological aspects of alcohol dehydrogenases in the ethanol metabolism of Saccharomyces cerevisiae   | 13           | De Smidt O      | Du Preez JC            | Albertyn J                          | 0.33               | 0.33             |
| Journal<br>no | Year of<br>publication | Volume and<br>issue no | Title of journal                                   | ISSN                 | Article title   | *CESM<br>Cat | 1st author      | 2 <sup>nd</sup> author | All other<br>authors                | Prop of<br>authors | Units<br>claimed |
| 7ſ            | 2012                   | 9(12)                  | Foodborne Pathogens<br>and Disease                 | 1535-3141            | Comparing Organic Acids and Salt Derivatives as Antimicrobials Against Selected Poultry-<br>Borne Listeria monocytogenes Strains In Vitro                                 | 10           | Lues JFR        | Theron MM              |                                     | 0.50               | 1.00             |
| JB            | 2012                   | 157                    | International Journal of<br>Food Microbiology      | 0168-1605            | Guaiacol production from ferulic acid, vanillin and naillic acid by<br>Alicyclobacillus acidoterrestris   | 13           | Witthuhn RC     | Van der<br>Merwe E     | Venter P<br>Cameron M               | 0.25               | 0.25             |
| ۶ſ            | 2012                   |                        | Journal of Deaf Studies and<br>Deaf Education      | 10814159             | Rethinking Education of Deaf Children in Zimbabwe: Challenges and Opportunities for<br>Teacher Education  | 60           | Musengi M       | Ndofirepi A            | Shumba A                            | 0.33               | 0.33             |
| 01L           | 2012                   | 33(2)                  | Journal of Public Health Policy                    | 0197-5897            | Exploring policy compliance of the South African informal milk-producing segment  | 8            | Agenbag MHA     | Lues JFR               | Lues L                              | 0.33               | 0.66             |
| J11           | 2012                   | 12                     | Sensors  | 1424-8220            | Reducing False Negative Reads in RFID Data Streams Using and Adaptive Sliding-<br>Window Approach   | 80           | Massawe LV      | Kinyua JDM             | Vermaak HJ                          | 0.33               | 0.66             |
| J12           | 2012                   | 42(5-1)                | South African Journal of<br>Animal Sciences        | 0375-1589            | Relationship between pelvic and linear body measurements in Dorper ewes   |              | Van Rooyen IM   | Fourie PJ              | Schwalbach<br>LMJ                   | 0.33               | 0.66             |
| J13           | 2012                   | 23(2)                  | South African Journal of<br>Industrial Engineering | 1012277X             | Limited run production using alumide® tooling for the plastic injection moulding process*   | 80           | Combrinck J     | Booysen GJ             | Van der Walt<br>JG<br>De Beer DJ    | 0.25               | 0.75             |
| J14           | 2012                   | 23(2)                  | South African Journal of<br>Industrial Engineering | 1012277X             | Assessment of surface finish and dimensional accuracy of tools manufactured by metal casting in rapid prototyping sand moulds   | 08           | Nyembwe K       | De Beer DJ             | Van der Walt<br>JG<br>Bhero S       | 0.25               | 0.25             |
| J15           | 2012                   | 50(2)                  | South African Journal of Surgery                   | 0038-2361            | Radiation dose to surgeons in theatre   | 60           | Van der Merwe B |                        |                                     | 1.00               | 1.00             |
| Journal<br>no | Year of<br>publication | Volume and<br>issue no | Title of journal                                   | ISSN                 | Article title   | *CESM<br>Cat | 1st author      | 2 <sup>nd</sup> author | All other<br>authors                | Prop of<br>authors | Units<br>claimed |
| J16           | 2012                   | 25                     | Systemic Practice and<br>Action Research           | 11213-011-<br>0214-8 | The Concerns-Based Adoption Model: Teachers' Participation in Action Research   | 07           | Khabali B       | O'Toole JM             |                                     | 0.50               | 0.50             |
| 21L           | 2012                   | 38(2)                  | Water SA   | 0378-4738            | Quantifying rainfall-runoff relationships on the Mieso Hypo Calcic Vertisol ecotope<br>in Ethiopia  | 08           | Welderufael WA  | Le Roux PAL            | Hensley M                           | 0.33               | 0.33             |
| J18           | 2012                   | 38(5)                  | Water SA   | 0378-4738            | Dairy farm borehole water quality in the greater Mangaung region of the Free State<br>Province, South Africa  | 10           | Esterhuizen L   | Fossey A               | Lues JFR                            | 0.33               | 1.00             |

Table 9: Publications in the ISI: Web of Science lists

Table 10: Publications in the IBSS index list

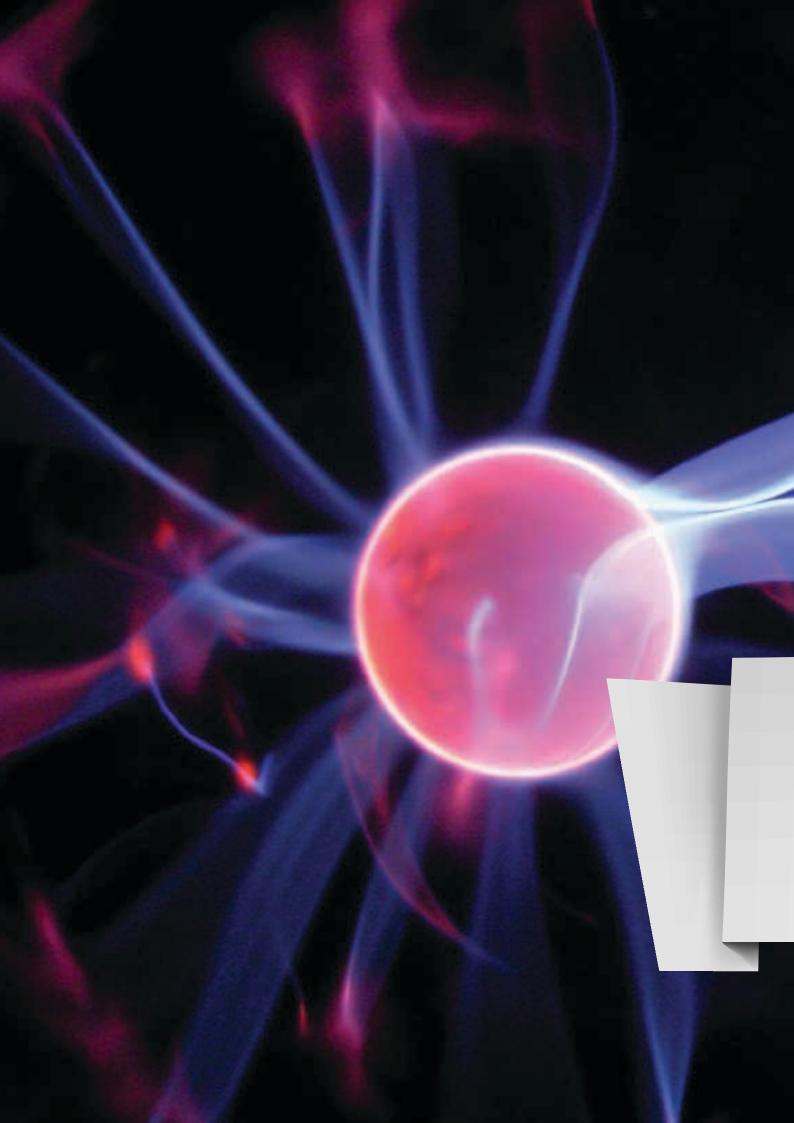
|               |                        |                              |  |           |  |              | Ā                      | Author(s) of contribution | ution                      |                    |                  |
|---------------|------------------------|------------------------------|--|-----------|--|--------------|------------------------|---------------------------|----------------------------|--------------------|------------------|
| Journal<br>no | Year of<br>publication | Volume<br>and<br>issue<br>no | Title of journal                                 | ISSN      | Article title  | *CESM<br>Cat | 1 <sup>st</sup> author | 2 <sup>rd</sup> author    | All other authors          | Prop of<br>authors | Units<br>claimed |
| J19           | 2012                   | 14(2)                        | Anthropologist                                   | 0972-0073 | Assessing the Writing Efficacy of Undergraduate Students at a South African University of Technology   | 07           | Matoti SN              | Shumba A                  |                            | 0.50               | 1.00             |
| J20           | 2012                   | 14(2)                        | Anthropologist                                   | 0972-0073 | Disputed yet Invaluable: Philosophical Inquity as Theory in Educational Research   | 07           | Ndofirepi AP           | Shumba A                  |                            | 0.50               | 0.50             |
| J21           | 2012                   | 14(4)                        | Anthropologist                                   | 0972-0073 | Challenges Faced by Students with Special Educational Needs in Early Childhood Development<br>Centres on Zimbabwe as Perceived by ECD Trainers and Parents | 07           | L npodM                | Shumba A                  |                            | 0.50               | 0.50             |
| Journal<br>no | Year of<br>publication | Volume<br>and<br>issue<br>no | Title of journal                                 | ISSN      | Article title  | *CESM<br>Cat | 1 <sup>st</sup> author | 2 <sup>nd</sup> author    | All other authors          | Prop of<br>authors | Units<br>claimed |
| J22           | 2012                   | 14(5)                        | Anthropologist                                   | 0972-0073 | Sexual Activity and Prevalence of Multiple Sexual Relationships among Female Students at a<br>University Campus in Zimbabwe                                | 07           | Mapfumo J              | Shumba A                  | Zvimba R<br>Chinyanganya P | 0.25               | 0.25             |
| J23           | 2012                   | 14(3)                        | Anthropologist                                   | 0972-0073 | What were the strong and weak points emanating from the Management of Quality Assurance in the former Technikons?  | 04           | Selesho J              |                           |                            | 1.00               | 1.00             |
| J24           | 2012                   | 14(3)                        | Anthropologist                                   | 0972-0073 | The Role of the Academic Heads of Departments in the Strategic Planning of the University  | 04           | Kola IM                | Selesho JM                |                            | 0.50               | 0.50             |
| J25           | 2012                   | 14(3)                        | Anthropologist                                   | 0972-0073 | The SERTEC Legacy: Quality assurance practices perceived to be most effective in<br>former Technikons?   |              | Selesho J              | Imenda SN                 |                            | 0.50               | 0.50             |
| J26           | 2012                   | 14(1)                        | Anthropologist                                   | 0972-0073 | Challenges regarding the implementation of the Revised National Curriculum Statement   | 07           | Monyane T              | Selesho JM                |                            | 0.50               | 1.00             |
| 72L           | 2012                   | 14(2)                        | Anthropologist                                   | 0972-0073 | Analysing views of intermediate phase educators with regard to their experiences of the Revised National Curriculum Statement                              | 07           | Selesho JM             | Monyane T                 |                            | 0.50               | 1.00             |
| J28           | 2012                   |                              | International Journal of<br>Children's Rights    | 0927-5568 | Stakeholders' perceptions of abuse of children with disabilities at a special school in Zmbabwe  | 07           | Musengi M              | Shumba A                  |                            | 0.50               | 0.50             |
| J29           | 2012                   | 4(3)                         | International Journal of<br>Educational Sciences | 0975-1122 | An Exploratory Study of Corporal Punishment by Teachers in Zimbabwean Schools: Issues and Challenges   | 07           | Shumba A               | Ndofrepi AP               | Musengi M                  | 0.33               | 0.33             |
| 130<br>Г      | 2012                   |                              | International Migration                          | 0020-7985 | The Causes and Impact of the Brain Drain in Institutions of Higher Learning in Zimbabwe  | 07           | Shumba A               | Mawere D                  |                            | 0.50               | 0.50             |

| Journal<br>no | Year of<br>publication | Volume<br>and<br>issue<br>no | Title of journal                              | ISSN      | Article title  | *CESM<br>Cat | 1 <sup>st</sup> author | 2 <sup>rd</sup> author | All other authors | Prop of<br>authors | Units<br>claime d |
|---------------|------------------------|------------------------------|---|-----------|--|--------------|------------------------|------------------------|-------------------|--------------------|-------------------|
| 131           | 2012                   | 37(1)                        | Journal of Human Ecology                      | 0970-9274 | "Poverty and HIV/AIDs": Are they Related? An Ecological Issue  | 07           | Selesho JM             |                        |                   | 1.00               | 1.00              |
| J32           | 2012                   | 38(2)                        | Journal of Human Ecology                      | 0970-9274 | The Zimbabwe Patients' Charter of Rights: Effects on Health Care Access by People with Disabilities<br>Living with HIV and AIDS                              | 0            | Mpofu J                | Shumba A               |                   | 0.50               | 0.50              |
| J33           | 2012                   | 40(1)                        | Journal of Human Ecology                      | 0970-9274 | An Assessment of Psychosocial and Empowerment Support Interventions for Orphans and Vulnerable Children in Zimbabwe  | 02           | Nyawasha TS            | Chipunza C             |                   | 0.50               | 0.50              |
| J34           | 2012                   | 30(3)                        | Journal of Social Sciences                    | 0971-8923 | Reasonable Children, Reasonable Citizens: The Contributions of Philosophy for Children to Post-<br>apartheid South Africa                                    | 02           | Ndofirepi AP           | Shumba A               |                   | 0.50               | 0.50              |
| J35           | 2012                   | 30(3)                        | Journal of Social Sciences                    | 0971-8923 | Reflections of Teacher Perceptions Regarding Curriculum Change in the Bloemfontein Area,<br>South Africa   | 02           | Naong MN               |                        |                   | 1.00               | 1.00              |
| J36           | 2012                   | 31(1)                        | Journal of Social Sciences                    | 0971-8923 | A Critique of Constructivist Theory in Science Teaching and Learning   | 07           | Shumba A               | Ndofirepi AP           | Gwirayi P         | 0.33               | 0.33              |
| J37           | 2012                   | 31(1)                        | Journal of Social Sciences                    | 0971-8923 | Making a Successful Transition during the First Year of University Study: Do Psychological and<br>Academic Ability Matter?                                   | 02           | Selesho JM             |                        |                   | 1.00               | 1.00              |
| J38           | 2012                   | 31(2)                        | Journal of Social Sciences                    | 0971-8923 | Barriers to the Implementation of Whole School Evaluation at Selected Primary Schools in the Southern Free State   | 20           | Setlalentoa W          |                        |                   | 1.00               | 1.00              |
| J39           | 2012                   | 31(2)                        | Journal of Social Sciences                    | 0971-8923 | Perceived Challenges Faced by Visually-impaired Students in Open and Distance Learning Centres in Zimbabwe   | 02           | Mpofu J                | Shumba A               |                   | 0.50               | 0.50              |
| Journal<br>no | Year of<br>publication | Volume<br>and<br>issue<br>no | Title of journal                              | ISSN      | Article title  | *CESM<br>Cat | 1 <sup>st</sup> author | 2 <sup>nd</sup> author | All other authors | Prop of<br>authors | Units<br>claimed  |
| J40           | 2012                   | 31(2)                        | Journal of Social Sciences                    | 0971-8923 | Attributes Utilised by knowledge workers in identifying employers of choice: Focus on Accountant and information technology (IT) specialists in South Africa | 04           | Chipunza C             | Kabungaidze T          |                   | 0.50               | 0.50              |
| J41           | 2012                   | 31(3)                        | Journal of Social Sciences                    | 0971-8923 | An Assessment of Student Teachers' Experiences of Work-integrated Learning at a South African<br>Institution of Higher Learning                              | 07           | Matoti SN              | Junqueira KE           |                   | 0.50               | 0.50              |
| J42           | 2012                   | 32(2)                        | Journal of Social Sciences                    | 0971-8923 | Neighbourhood Social Capital and HIV/AIDS: Assessing Neighbourliness and Social Attachment in rural South African villages                                   | 20           | Nyawasha TS            | Nekhwevha FH           | Chipunza C        | 0.33               | 0.33              |
| J43           | 2012                   | 32(3)                        | Journal of Social Sciences                    | 0971-8923 | Effect of Role Clarity and Work Overload on Perceptions of Justice and Job Insecurity after Downsizing   | 04           | Chipunza C             | Samuel MO              |                   | 0.50               | 0.50              |
| J44           | 2012                   | 33(2)                        | Journal of Social Sciences                    | 0971-8923 | Factors Influencing Students' Career Choice and Aspirations in South Africa  | 07           | Shumba A               | Naong MN               |                   | 0.50               | 1.00              |
| J45           | 2012                   | 32(2)                        | South African Journal of<br>African Languages | 0257-2117 | The presentation of female characters of BM Khaketla's texts: A literary analysis  | 07           | Phindane PA            |                        |                   | 1.00               | 1.00              |
| J46           | 2012                   | 10(2)                        | Studies of Tribes and Tribals                 | 0972-639X | Witchcraft and Social Life in Zimbabwe: Documenting the Evidence   | 20           | Chiresher E            | Chireshe R             | Shumba A          | 0.33               | 0.33              |
| J47           | 2012                   | 10(2)                        | Studies of Tribes and Tribals                 | 0972-639X | Perspectives on the Functioning of an Effective School Attended by Learners from Rural Schools   | 07           | Thabane WR             | Selesho JM             |                   | 0.50               | 1.00              |
|               |                        |                              |   |           |  |              |                        |                        |                   |                    |                   |

Table 11: Publications in SA approved journals

|               |                        |                           |  |           |  |              | Auth          | Author(s) of contribution | uo                                   |                    |                  |
|---------------|------------------------|---------------------------|--|-----------|--|--------------|---------------|---------------------------|--------------------------------------|--------------------|------------------|
| Journal<br>no | Year of<br>publication | Volume<br>and issue<br>no | Title of journal   | ISSN      | Article title  | *CESM<br>Cat | 1st author    | 2 <sup>nd</sup> author    | All other<br>authors                 | Prop of<br>authors | Units<br>claimed |
| J48           | 2012                   | 19(2)                     | Acta Structilia  | 1023-0564 | Infrastructure project performance in the South African construction sector:<br>Perceptions from two provinces   | 08           | Emuze F       | Smallwood J               |                                      | 0.50               | 0.50             |
| J49           | 2012                   | 20(2)                     | Administra Publica   | 1015-4833 | Local government turnabout strategy: challenges constraints and benefits   | 64           | Van Niekerk T |                           |                                      | 1.00               | 1.00             |
| J50           | 2012                   | 9(2)                      | Africa Education Review  | 1814-6627 | Educators' understanding of the mediation role in the classroom  | 07           | Ngidi DP      |                           |                                      | 1.00               | 1.00             |
| J51           | 2012                   | 23(3)                     | Cardiovascular Journal of Africa   | 1995-1892 | Cardiac surgery risk-stratification models   | 60           | Prins C       | Jonker I de V             | Botes L<br>Smit FE                   | 0.25               | 0.50             |
| J52           | 2012                   | 17                        | Communitas   | 1023-0556 | Can social communication be used as a strategy to enhance teaching and learning of life sciences? Perceptions of student teachers  | 20           | Setlalentoa W |                           |                                      | 1.00               | 1.00             |
| J53           | 2012                   | 49(3&4)                   | Journal for Christian Scholarship/ Tydskrif<br>vir Christelike Wetenskap | 1013-1116 | Enchanging anti-corruption strategies in promoting good governance and sound ethics in the South African public sector   | 64           | Van Niekerk T | Olivier B                 |                                      | 0.50               | 1.00             |
| J54           | 2012                   | 49(3&4)                   | Journal for Christian Scholarship/ Tydskrif<br>vir Christelike Wetenskap | 1013-1116 | Die identifisering van boustene vir die ontwerp van 'n etiek vir ontmoeting  | 17           | Lategan LOK   |                           |                                      | 1.00               | 1.00             |
| J55           | 2012                   | 49(3&4)                   | Journal for Christian Scholarship/ Tydskrif<br>vir Christelike Wetenskap | 1013-1116 | Can theology be anything but public? Rethinking the role of theology at a public university  | 17           | Lategan LOK   |                           |                                      | 1.00               | 1.00             |
| J56           | 2012                   | 10(1)                     | Journal for New Generation Sciences                                      | 1684-4998 | Challenges in financial control and accountability in South African municipalities   | 6            | Laubscher LH  |                           |                                      | 1.00               | 1.00             |
| Journal<br>no | Year of<br>publication | Volume<br>and issue<br>no | Title of journal   | ISSN      | Article title  | *CESM<br>Cat | 1st author    | 2 <sup>nd</sup> author    | All other<br>authors                 | Prop of<br>authors | Units<br>claimed |
| J57           | 2012                   | 10(1)                     | Journal for New Generation Sciences                                      | 1684-4998 | The impact of varying aphild populations in different shade house structures on<br>some physical characteristics of head lettuce, cultivated in the Central Free State<br>(South Africa) | 2            | Pretorius RJ  | Louw S vd M               | Venter P,<br>Van der<br>Westhuisen C | 0.25               | 0.75             |
| J58           | 2012                   | 10(1)                     | Journal for New Generation Sciences                                      | 1684-4998 | Mentorship of student teachers on teaching practice: perceptions of teacher mentors in Zimbabwean schools  | 20           | Shumba A      | Shumba J                  | Maphosa D                            | 0.33               | 0.33             |
| J59           | 2012                   | 10(1)                     | Journal for New Generation Sciences                                      | 1684-4998 | Utilising multi-agent systems to develop an intelligent maintenance management system based on the Drools-planner  | 80           | Weppenaar DV  | Vermaak HJ                | Kinyua J                             | 0.33               | 0.66             |
| 09f           | 2012                   | 10(3)                     | Journal for New Generation Sciences                                      | 1684-4998 | Reflecting on the knowledge management practices of a University of Technology   | 04           | Kokt D        | Le Roux P                 |                                      | 0.50               | 1.00             |
| J61           | 2012                   | 10(3)                     | Journal for New Generation Sciences                                      | 1684-4998 | Reflecting on multir, inter- and trans-disciplinary (MIT) research at the Central University of Technology, Free State (CUT)   | 45           | Kokt D        | Lategan LOK               | Orkin FM                             | 0.33               | 1.00             |
| J62           | 2012                   | 10(3)                     | Journal for New Generation Sciences                                      | 1684-4998 | Academic and professional pedagogy: A conceptual perspective   | 07           | Ntshoe I      | Holzbaur UD               |                                      | 0.50               | 1.00             |
| J63           | 2012                   | 10(3)                     | Journal for New Generation Sciences                                      | 1684-4998 | The nature of international student's adjustment problems in a South African University: Implications for international students and student administrators                              | 8            | Dzansi DY     | Monnapula-<br>Mapesela M  |                                      | 0.50               | 1.00             |
| J64           | 2012                   | 8(2)                      | Journal for Transdiciplinary Research in<br>Southern Africa              | 1817-4434 | Investigating an effective supply chain for a refinery in a regulated petroleum sector   | 08           | Adendorf A    | Emuze R                   | Khulu V                              | 0.33               | 0.33             |

| Journal<br>no | l Year of<br>publication | Volume<br>and issue<br>no | Title of journal   | ISSN      | Article title  | *CESM<br>Cat | 1st author    | 2 <sup>rd</sup> author | All other<br>authors                       | Prop of<br>authors | Units<br>claimed |
|---------------|--------------------------|---------------------------|--|-----------|--|--------------|---------------|------------------------|--|--------------------|------------------|
| J65           | 2012                     | 11(1)                     | Journal of Educational Studies                                   | 1680-7456 | Student drop-out in a Post-Graduate Certificate in Education: Challenges<br>and implications   | 20           | Mabunda PL    | Ntshoe IM              |  | 0.50               | 0.50             |
| 99L           | 2012                     | 54(2)                     | Journal of the South African Institution of<br>Civil Engineering | 1021-2019 | Evaluation of the standard design flood method in selected basins in South Africa  | 80           | Gericke OJ    | Du Plessis JA          |  | 0.50               | 0.50             |
| 79L           | 2012                     | 54(2)                     | Journal of the South African Institution of<br>Civil Engineering | 1021-2019 | Catchment parameter analysis in flood hydrology using GIS applications   | 80           | Gericke OJ    | Du Plessis JA          |  | 0.50               | 0.50             |
| J68           | 2012                     | 144                       | Journal of Theology for Southern Africa                          | 0047-2867 | Parishioners' Attitudes towards Clergywomen: A South African Case Study  | 64           | Jonck P       | Le Roux A              | Hoffman L                                  | 0.33               | 0.33             |
| 69L           | 2012                     | 26(2)                     | Medical Technology SA  | 1011-5528 | Incidence of Aerobic Spoilage and Psychrotropic Bacteria in Non-Pasteurised and<br>Pasteurised Bovine Milk from Maseru                       | 13           | Moshoeshoe SL | Olivier D              |  | 0.50               | 1.00             |
| 02L           | 2012                     | 26(2)                     | Medical Technology SA  | 1011-5528 | Reference ranges for platelet indices using Sysmec XE-2100 Blood Analyser  | 13           | Botma J       | Mogongoa LF            | Jaftha AD; Janse<br>van Rensburg W         | 0.25               | 0.25             |
| 17L           | 2012                     | 26(2)                     | South African Journal of Higher Education                        | 1011-3487 | Conceptualising postgraduate training in biotechnology at universities of technology   | 13           | Fossey A      |                        |  | 1.00               | 1.00             |
| J72           | 2012                     | 26(2)                     | South African Journal of Higher Education                        | 1011-3487 | Developing academic writing skills as part of graduate attributes in<br>undergraduate curricula  | 20           | Du Preez I    | Fossey A               |  | 0.50               | 1.00             |
| J73           | 2012                     | 26(2)                     | South African Journal of Higher Education                        | 1011-3487 | Redefining work integrated learning in universities of technology  | 60           | Bohloko GM    |                        |  | 1.00               | 1.00             |
| J74           | 2012                     | 26(2)                     | South African Journal of Higher Education                        | 1011-3487 | Towards distinctive and developmental curricula at UoTs: The STEPS process at CUT  | 0            | Mthembu TZ    | Orkin M                | Gering M                                   | 0.33               | 1.00             |
| Journal<br>no | l Year of<br>publication | Volume<br>and issue<br>no | Title of journal   | ISSN      | Article title  | *CESM<br>Cat | 1st author    | 2 <sup>nd</sup> author | All other<br>authors                       | Prop of<br>authors | Units<br>claimed |
| J75           | 2012                     | 26(2)                     | South African Journal of Higher Education                        | 1011-3487 | 4th Annual SATN Conference 2011: Curriculum transformation at universities of technology: Towards development of new generation universities |              | Mthembu TZ    |                        |  | 1.00               | 1.00             |
| J76           | 2012                     | 26(2)                     | South African Journal of Higher Education                        | 1011-3487 | Reframing curriculum and pedagogical discourse in universities of technology   | 0            | Ntshoe I      |                        |  | 1.00               | 1.00             |
| 77L           | 2012                     | 29 (3&4)                  | South African Journal of Plant and Soil                          | 0257-1862 | Yield and quality response of rose geranium (Pelargonium graveolens L) to sulphur<br>and phosphorus application                              |              | Sedibe MM     | Allemann J             |  | 0.50               | 0.50             |
| J78           | 2012                     | 42(2)                     | South African Journal of Psychology                              | 0081-2463 | Psychological undertones of family poverty in rural communities in Cameroon:<br>resilience and coping strategies                             |              | Tchombe TMS   | Shumba A               | Lo-oh JL Zinkeng<br>M Gakuba TO<br>Teku TT | 0.17               | 0.17             |
| 62L           | 2011                     | 10(2)                     | Journal of Educational Studies                                   | 1680-7456 | The impact of leadership and management of host schools on the construction of professional identity of teacher trainees                     | 20           | Matoti SN     |                        |  | 1.00               | 1.00             |
| TOTAL         |                          |                           |  |           |  |              |               |                        |  |                    | 55.36            |
|               |                          |                           |  |           |  |              |               |                        |  |                    |                  |







Prof. GD Jordaan Director: Technology and Innovation

The following major challenges are currently being addressed by Technology and Innovation:

- The development of the role and place of technology transfer and innovation as an academic support service at CUT.
- The continued roll-out of a formal Technology Transfer Office.

### INTRODUCTION

The relocation of the CRPM and the offices of the PDTS were completed during 2012. The move temporarily disrupted the functioning of these units to some extent. However, in spite of this, both the PDTS and the CRPM are still in a relatively strong position financially and are functioning at a satisfactory level.



Dr M Mostafa, Prof G Jordaan, Prof D Kokt, Prof Y Woyessa, Pof. H Friedrich-Nel,

## UNIT OF TECHNOLOGY AND INNOVATION

### Talloires network

Ways to maximise possible benefits for the CUT from its Talloires Network membership, as well as other, related developments in inter-institutional networking, are being investigated by Technology and Innovation – especially with respect to the university's contribution to socio-economic development and sustainable development.

# SEDA AGRICULTURAL AND MINING TOOLING INCUBATOR (SAMTI)Purpose of UnitReport

The SAMTI is an element of the Science and Technology Programme of the *Small Enterprise Development Agency* (Seda). It is funded by the *Department of Trade and Industry* and is aimed at the development of an enhanced technical capacity in toolmaking, with special emphasis on the agricultural and mining sector. The Director: Technology and Innovation functions as liaison between CUT and SAMTI. The Seda Agricultural and Mining Tooling Incubator (SAMTI) is operational and tenants are being educated in business practices and technical skills in toolmaking. The incubatees have already been trained by SAMTI in the essentials of mechanical workshop practice. Unfortunately the additional operational space that was allocated to SAMTI has not yet been made available for this purpose.



PDTS Strategic Planning Session

## SUSTAINABLE DEVELOPMENT PROJECT

The roll-out of the *Sustainable Development Project* (SD) continues unabated, with frequent interactions by the responsible individuals with different operational units of the university.

A special edition of the Interim concerning the roll-out of the SD project is currently being prepared. Several different operational units of CUT have submitted articles for this purpose.

## INNOVATION AND INTELLECTUAL PROPERTY

## Technology transfer office

In an effort to comply with the specifications of the *Intellectual Property (IP) Act*, and in alignment with the approved IP policy and Manual, an institutional *IP Steering Committee* and support structure was created during the course of 2012. This structure supervises the local implementation of Act 51/2008.

Due to the approval of the first version of the IP policy late last year, the *National Intellectual Property Management Office* (NIPMO) can now be provided with the official CUT IP Policy.

Three proposals for new patents and one design registration have been submitted to patent attorneys for possible registration.

## Medical device innovation platform (MDIP)

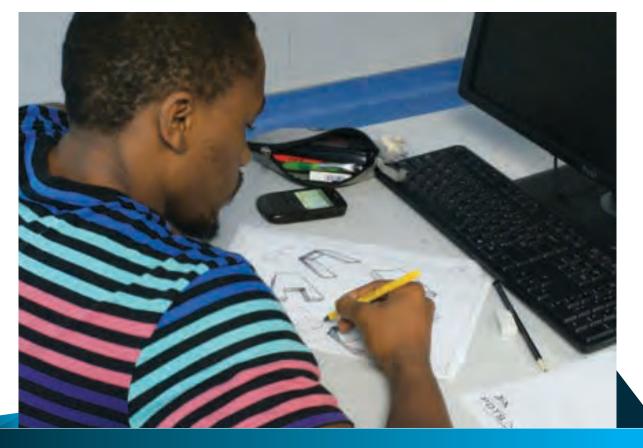
#### Purpose of unit

The MDIP was established to ease the development of commercially viable medical devices through collaborative efforts of participating universities and their students. The initiative is financed by the *Medical Research Council* and all projects are to be executed jointly by staff and postgraduate students of at least two participating universities.

#### Report

Only one externally funded project – to a value of R100 000 – is currently being executed by CUT on behalf of the MDIP. Dr Van der Walt supervises this project – which is nearing completion – and it should result in a student receiving an MTech in Mechanical Engineering.

Should the research chair be filled, it would probably contribute significantly in raising CUT's involvement in this initiative.



PDTS Sketching Course for Interns and Students

## Purpose of the Fablab

the Fablab is an initiative of the *Department* of Science and Technology (DST) with the purpose of introducing learners to the value of engineering and manufacturing. Private individuals may also make use of the facilities to test and develop their own innovative ideas.

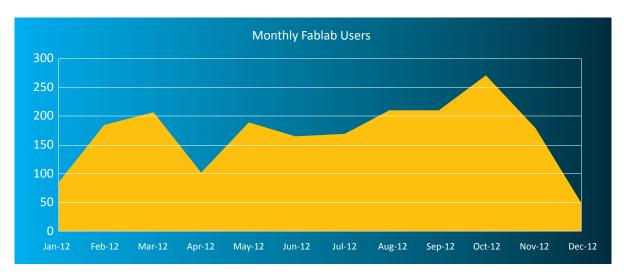
The Fablab Free State is currently in its sixth year of operation since its official opening on 23 October 2006. It is primarily sponsored by the DST, with a limited contribution from CUT.

## Fablab users

The Fablab had an average of 156 users monthly and a total of 1870 users from January to December 2012.

#### Average monthly user profile:

| School learners             | 48  | 31% |
|-----------------------------|-----|-----|
| Tertiary students           | 102 | 65% |
| Individuals / Entrepreneurs | 5   | 4%  |



There were six visits by groups of school learners to the Fablab:

- Fichardtpark High School
- Martie du Plessis High School
- Eunice High School
- Techno Girls Group through the Department of Science and Technology
- FEIT learner career guidance workshop
- Heatherdale High School

School learners made use of the Fablab to research their school projects and tasks, and also for their projects for the *Eskom Expo for Young Scientists*. The Fablab provided Internet access for learners to do basic research on their projects.

The Fablab presented an exhibition at the *National Science Week* where a multitude of school learners were introduced to the concept of personal fabrication at the Fablab.

The Fablab staff presented two workgroup sessions:

- T-shirt painting for CUT students
- FabKids workshop for school learners

Several Electrical Engineering students from the CUT made use of the Fablab to fabricate project enclosures for their electronic circuits, while students from the CUT *Design and Visual Art School* fabricated various artworks by means of vinyl cutting, laser engraving and cutting, as well as vacuum forming of plastic.

The Fablab assisted close to a hundred users from May to September 2012 to fabricate luminaries and lighting systems for the 2012 Eskom Energy Efficient Lighting Design Competition. The regional judging took place at the CUT in September 2012 and the Fablab is proud to have assisted the regional winner in fabricating the winning luminaire.

## Fablab project assistants

Messrs Gustav Barnard and Julian Mokoma were re-appointed in the Fablab for the 2012 calendar year. Both assistants have shown great passion for working in the Fablab and assisting Fablab users with their projects.

### Research related projects

• 3D Printer

The Fablab obtained a 3D printer to expand the services offered. The 3D printer was designed and developed by the *Netherlands Fablab* and is an open source project. Local users will be able to print their designs in 3-D – adding yet another dimension to fabrication in the Fablab.

#### Arduino

The Fablab personnel evaluated the *Arduino* robot control development system, which is an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. It is intended for use by artists, designers, hobbyists, and in fact anyone interested in creating interactive objects or environments. It is a very useful prototyping platform which is suitable for numerous projects that require some electrical circuitry.

#### Media

• Television

*Urban Brew Studios* producer Matthew Fox and his film crew spent a day in the Fablab to produce an episode of *DIGI KNOW* for YO TV. *Digi Know* is a technology magazine show aimed at 12- to 15-year-olds. It features the latest gadgets as well as all the techno 'how to's' – to keep our young people up to speed and in tune with the rest of the world.

• Newspaper

The article Fablab produces young innovators appeared in the The Weekly newspaper of 25 May 2012, which describes the Fablab as 'a precious gem designed to accelerate creativity and innovation'.

Internet

The following project articles were published on the South African Fablab's website, www.fablab. co.za, and the articles were viewed by more than 900 readers.

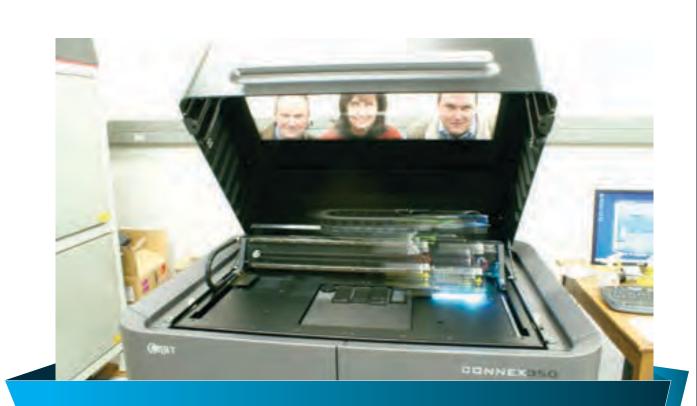
- Talking Book (most popular article)
- Vacuum Former
- Ultraviolet PCB Development Machine
- Robotics Literature and Kits
- Ultimaker 3D Printer
- Fabulous Lighting
- Digi Know

## Fablab funding

The Fablab received R515 625 in annual funding from the CSIR for the 2012/2013 financial year.



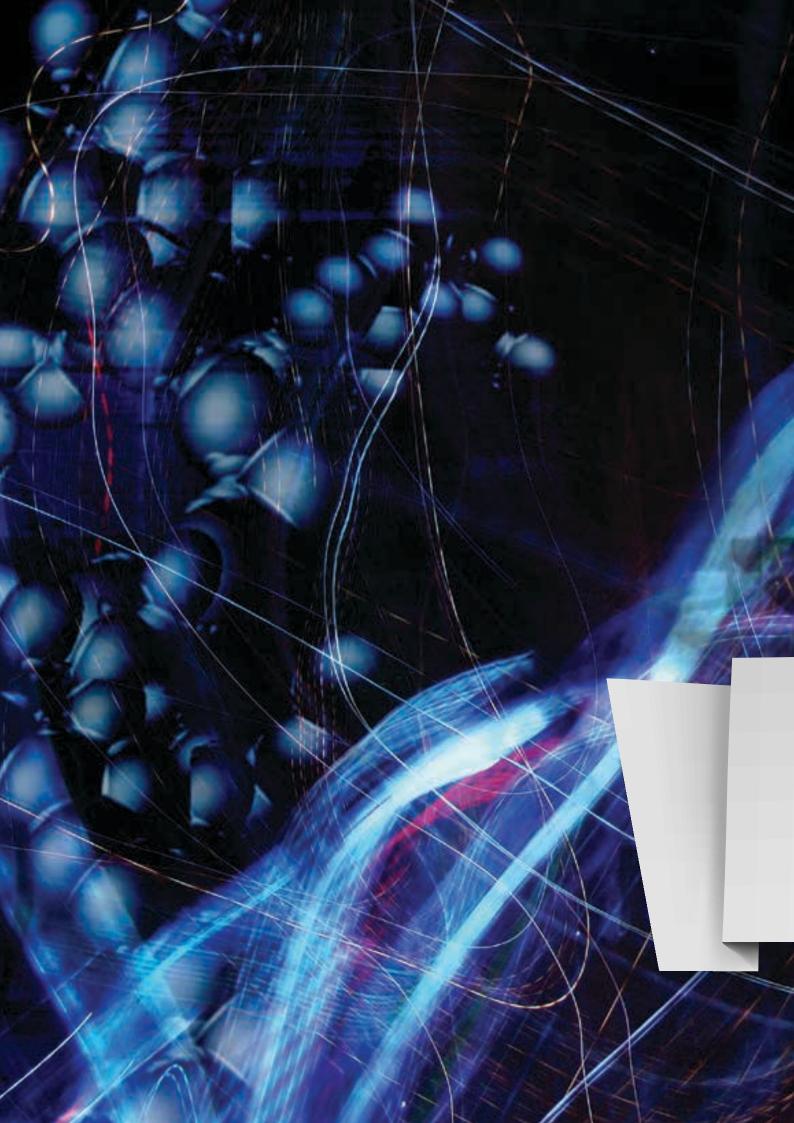
**PDTS** Water Measuring device developed for a client.



**CRPM** – New Object Connex TM 3D Printing Machine



World class CRPM facilities which were inaugurated in September 2012





## FACULTY ENGINEERING & INFORMATION TECHNOLOGY



**Prof. A Ngowi** – Dean: Engineering and Information Technology

The faculty is becoming much more involved with the research groups within the departments and the results of this have been showing in terms of outputs. A number of new research collaboration initiatives have been started and existing ones continue to grow. External funding has been secured for certain projects. The highlight of the year was of course the awarding of the SARChi Chair in Medical Product Development through Additive Manufacturing.

The faculty held its 15<sup>th</sup> Annual Research Seminar and is currently planning an international conference for 2014.

The faculty staff contributed to:

- 10 papers in accredited journals
- 4 papers in peer-reviewed journals
- 1 book publication
- 7 presentations at international conferences
- 11 presentations at national conferences



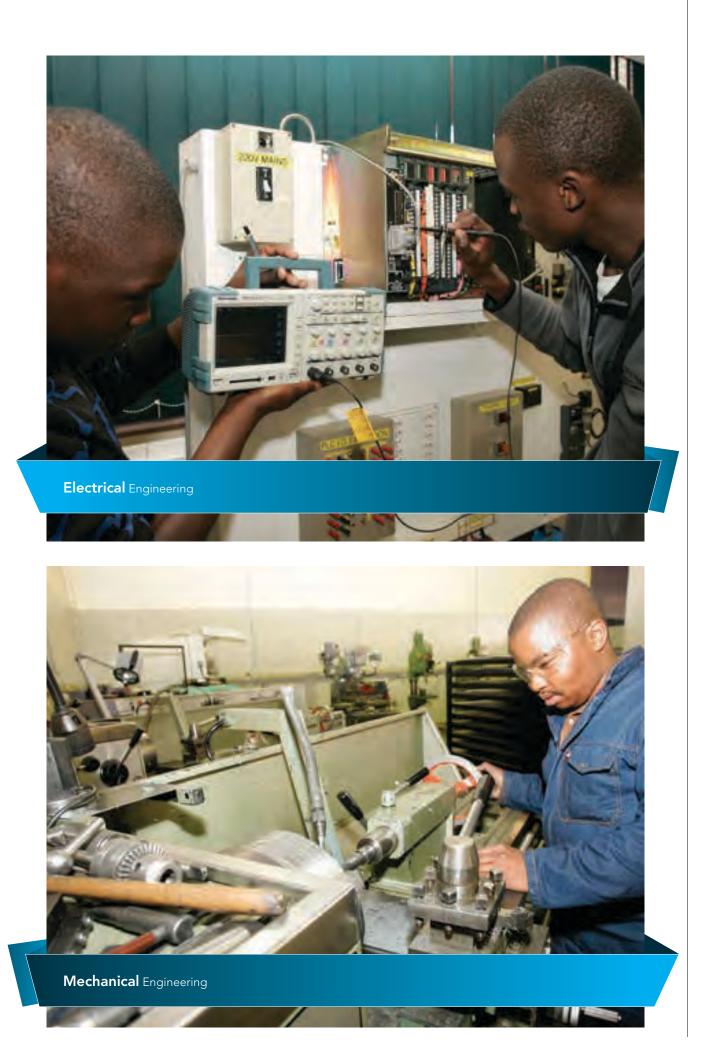
**Prof. H Vermaak** – Acting Dean: Engineering and Information Technology

The faculty was involved in:

- 14 national workshops/congresses
- 4 staff members serve on the editorial boards of accredited publications
- 6 staff members acted as reviewers for accredited articles in journals

In 2012 the student team from the RGEMS research group that entered the *Siemens Cyber Junkyard Competition* were crowned the national winners of the competition.





## FACULTY: HEALTH & ENVIRONMENTAL SCIENCES



The Faculty of Health and Environmental Sciences drew its Strategic Research Plan from the Research and Development Plan of the Central University of Technology, Free State which emphasised three key areas for research and research development:

- the development of a sustained research culture;
- the improvement of research outputs; and
- the development of strategic research partners and programmes.

This plan was an institutional research plan to which various role players made a contribution. The faculties were responsible for the research outputs, with the Offices for Research and Development and Technology and Innovation being supportive of these initiatives.

This plan promoted 11 objectives. The objectives were:

- Objective 1: Development of staff and student researchers
- Objective 2: Postgraduate retention and throughput
- Objective 3: Increase in accredited publications
- Objective 4: Sustainability of existing externally funded research projects
- Objective 5: On-going development of new SET research niche areas

- Objective 6: Development and sustaining of partnerships with public and private funding agencies and regional, national and international universities
- Objective 7: Development and sustaining of partnerships with business and industry
- Objective 8: Increasing of income through research projects
- Objective 9: Development of postdoctoral research fellows as future research fellows
- Objective 10: Marketing the CUT as regional leader in SET research
- Objective 11: Development of opportunities to read papers at national and international conferences.

These objectives concentrated on (1) research skills development and (2) creation of an enabling research environment. These outcomes will be integrated into four leading principles articulated in the University's Vision 2020. These principles are sustainable development, socio-economic development, input leading to outcomes and outcomes leading to impact.

## POSTGRADUATE DEGREES AWARDED IN THE FACULTY OF HEALTH AND ENVIRONMENTAL SCIENCES IN 2012

### Autumn Graduation Ceremony

The following students graduated during 2012:

- MTech: Agriculture awarded to MB Masenya (Cum Laude) – Supervisors: Prof. TL Nedambale and Prof. DO Umesiobi
- MTech: Agriculture awarded to OG Makgothi

   Supervisors: Prof. DO Umesiobi and Dr AT Kanengoni
- MTech: Agriculture awarded to PH Mashiane
   Supervisors: Prof. DO Umesiobi and Dr JB Stevens
- MTech: Agriculture awarded to IM Van Rooyen – Supervisors: Prof. PJ Fourie and Dr LMJ Schwalbach (1966-2011)
- 5. MTech: Agriculture awarded to NCP van Tonder – Supervisors: Dr RJ van der Westhuizen and Prof. C van der Westhuizen
- MTech: Environmental Health awarded to LM Jackson – Supervisors: Prof. JFR Lues and Prof. C Griffith
- MTech: Environmental Health awarded to RS Slabbert – Supervisors: Dr MM Theron and Prof. JFR Lues

- MTech: Environmental Health awarded to EM Smith – Supervisors: Prof. P Venter and Dr O de Smidt
- 9. DTech: Environmental Health awarded to H Swanepoel – Promoters: Prof. P Venter, Prof. JFR Lues, Prof. I Ivanov and Dr NJ Luwes

### Spring Graduation Ceremony

The following students graduated during 2012:

- MTech: Agriculture awarded to BW Mgcoyi

   Supervisors: Dr MM Sedibe, Prof. C van der Westhuizen and Dr NJJ Combrinck
- MTech: Agriculture awarded to NE Radebe

   Supervisors: Prof. DO Umesiobi and Prof. C. van der Westhuizen
- MTech: Biomedical Technology awarded to NJ Smit – Supervisors: Dr MM Theron, Dr C Jansen van Rensburg, Dr O de Smidt and Prof. GE Ekosse
- MTech: Environmental Health awarded to J Beukes – Supervisors: Prof. JFR Lues and Dr EJ Smit
- 5. MTech: Environmental Health awarded to J Mukamugema – Supervisors: Prof. K Shale, Prof. JFR Lues and Prof. P Venter

## ACTIVITIES ON POSTGRADUATE RESEARCH SUPPORT

Research colloquium held by the Faculty of Health and Environmental Science

| Date       | Presenter                  | Торіс  |
|------------|----------------------------|--|
| 16/03/2012 | Prof. S Mashele            | Research funding   |
|            | Prof. C van der Westhuizen | Common principles, mistakes and shortcomings in research |
| 01/06/2012 | Prof. E vd Heever-Kriek    | Research colloquium: The research process                |
|            | Prof. PJ Fourie            | Writing up tips  |
| 14/09/2012 | Prof. H Friedrich-Nel      | Formative postgraduate assessment                        |
| 16/11/2012 | Prof. A Pretorius          | Critical thinking  |
|            | Prof. JFR Lues             | Fostering a research culture                             |

## Workshop on scientific writing

A workshop on scientific writing was organised by the Office for Research and Innovation on

29 August 2012 to assist postgraduate students to improve their research writing skills.

## PROFESSORIAL INAUGURAL ADDRESS IN THE FACULTY OF HEALTH & ENVIRONMENTAL SCIENCES

On Thursday, 15 November 2012, Professor Dennis O. Umesiobi of the Faculty of Health and Environmental Science presented a professorial inaugural address to the Central University of Technology and wider audience.

Professor Umesiobi's inaugural address was titled: *Biostimulation: A Frigid Tundra? Issues on Assisted Pig Reproduction.* His research in pig reproduction, using biostimulatory pathways, was extensively explained in his presentation. According to his research, four biostimulation pathways have been implicated to produce spontaneous stimulatory effects on sows and gilts. These pathways include: olfactory, visual, auditory and tactile pathways. He explained how the different components within the pig's central nervous system coordinate and process stimuli. His studies show how biostimulation can be enhanced by the use of assisted reproductive protocols such as sexual preparations and polysperm admixture amongst others.

Results from this research show that these biostimulatory protocols could be used to alleviate infertility and sub-fertility in primates and other non-primates. Prof. Umesiobi is a rated researcher with the NRF and travels frequently to conferences and workshops. He is also an NRF grant holder.

## RESEARCH PROSPECTS IN THE FACULTY OF HEALTH & ENVIRONMENTAL SCIENCES

During the latter part of the 2012 academic session, the Faculty of Health and Environmental Sciences was bestowed with four brand new departments, namely the Departments of Agriculture, Clinical Sciences, Health Sciences and Life Sciences. These departments came to fruition following the STEPS process, which ultimately gave impetus to the adjustment and clustering of some programmes in the faculty to form the four departments.

It has been heart-warming to see the astronomical improvements in research outputs from the various departments. It is speculated that this positive outlook has occurred mostly because most of the academic staff are making use of the opportunity to promote their academic prowess by engaging in more research activities, while at the same time sustaining and elevating the status of their newly-created departments. To put it briefly, it is strongly anticipated that such proactive research engagements will result in the realization of the VISION 2020 of the Central University of Technology (CUT), which includes and encourages the development of next generation and emerging new researchers, socio-economic development and community sustainability. ABRIDGED VERSION OF THE INAUGURAL ADDRESS OF PROF. DENNIS O. UMESIOBI PRESENTED ON THURSDAY 15 NOVEMBER 2012 IN THE JAPIE VAN LILL AUDITORIUM, CENTRAL UNIVERSITY OF TECHNOLOGY, FREE STATE, BLOEMFONTEIN CAMPUS

Biostimulation: A Frigid Tundra? Issues on Assisted Pig Reproduction



Prof. D Umesiobi – Head of Department: Agriculture

Biostimulation is the stimulus provoked by the presence of a male, which induces fertility (e.g. estrus and ovulation) through genital stimulation, pheromones, or other external cues (Umesiobi & Iloeje, 1999; Umesiobi et al., 2000, 2006, 2008, 2010). Boars have a profound influence on the pig breeding system, triggering neuroendocrine reflexes which alter reproduction in females. This importance is independent of the role of the boar as provider of sperm for production of new offspring.

Four biostimulation pathways have been implicated (Umesiobi, 2010) to produce spontaneous stimulatory effects on gilts/sows and they include: olfactory, visual, auditory and tactile cues (*Figure 1*).

In the olfactory transcriptions (*Figure 2*), the main olfactory bulb (*MOB*) was considered to be responsible for recognising odorant molecules, whereas the vomeronasal system (*VNO*), which traps the chemical cues from the nose to the main olfactory epithelium (*MOE*) was thought to be tuned for sensing pheromones. An animal that detects a stimulus must identify familiar stimuli and recall a meaning associated with them. The animal will assign meaning to the stimuli based on the circumstances of detection and memory formation. Areas of the amygdala (*ACO*), hypothalamus (*LH*), and orbitofrontal cortex (*ORB*) are all important for assigning and recalling meaning.

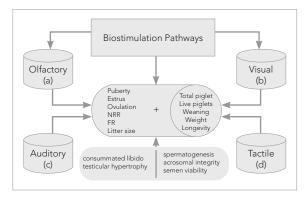


Figure 1: Biostimulation stimuli implicated to have significant influences on the reproduction processes in pigs

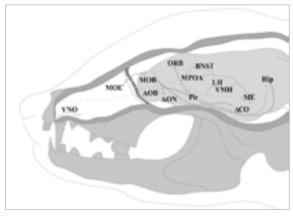


Figure 2: Olfactory epithelium of pig

The second biostimulation pathway is the visual system (*Figure 3*), which is part of the central nervous system that enables pigs to process visual details, enabling several non-image-forming photo-response functions and which affect estrus periodicity (Umesiobi, 2010).



Figure 3: Using visual contact, the boar interprets the artificial insemination (AI) protocols to the sow by characteristic grunts (vocal noises) and saliva emissions, which concomitantly enhance sperm transport and prompt fertilization of the ova.

The third biostimulation stimulus – tactile system or physical contact – refers to stimulation reaching the central nervous system from receptors in the skin. Tactile receptors alert the animals to their immediate environment and can get them to react to an unexpected or unusual stimulus before it can become a danger. They also help the animals perceive and navigate their environment.

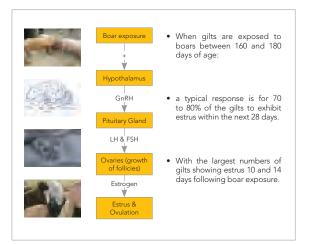


Figure 4: Presence of a boar evokes estrus expression in gilts/sows

Studies (Umesiobi & Iloeje, 1999; Umesiobi, 2007, 2008a; b) indicate that biostimulation is enhanced by the use of assisted reproductive protocols such as sexual preparations, polysperm admixture, Clomiphene citrate and vitamin E administrations, hemi-orchiectomy of experimental boars, amongst others.

Current *AI* procedures recommend that boars should include providing boar exposure before, during and even after AI to promote adequate ejaculation, uptake, transport, and retention of semen. Since providing boar exposure has some positive impact on the efficiency of *AI*, ways to improve boar libido and eliciting of optimum boar factors were developed.

Results indicate that these biostimulatory protocols could be used to alleviate infertility and sub-fertility in primates (humans) and other non-primates.

Please, wear smiles with this olfactory nostalgia:

"Pigs – the cleanest animals ever lived, their instinctive curiosity (rather than knack) to remain ever clean makes them relatively dirty – i.e. not dirty in absolute terms."

– Dennis O. Umesiobi

#### VISITING PROFESSOR: PROF. JOYCE MACKINNON: 17 TO 25 SEPTEMBER 2012



(L) Prof. J MacKinnon – Professor and Associate Dean: School of Health and Rehabilitation Sciences, Indiana University, Indianapolis.

(R) Prof. H Friedrich-Nel – Head of Department: Radiography and Clinical Sciences

Prof. Joyce MacKinnon, professor and associate dean at the School of Health and Rehabilitation Sciences, Indiana University in Indianapolis, is a visiting professor at the Faculty of Health and Environmental Sciences of the CUT. She visited the CUT from 17 to 25 September 2012. During the visit Prof. MacKinnon and Prof. Hesta Friedrich-Nel worked on a manuscript for publication in the Journal of Higher Education on postgraduate formative assessment. The provisional title of the manuscript is 'Best practices in formative postgraduate assessment: a USA-SA perspective'. The data collected at the IUPUI as part of the Fulbright scholarship project (completed in 2011) were used, together with new data collected from academics at the CUT.

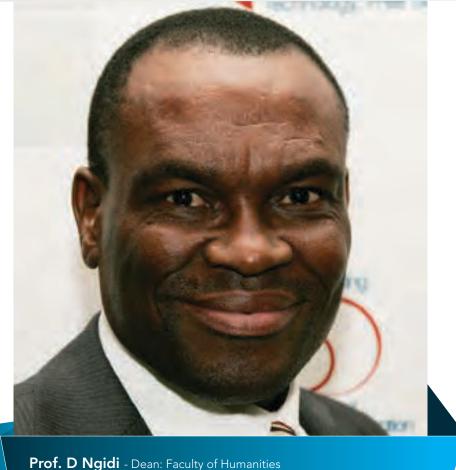
Prior to the visit several drafts of the manuscript were exchanged; however, it was only during the face-to-face meeting on 17 September that the focus of the manuscript could be finalised. During the week the results collected at the CUT were analysed together with those collected at IUPUI in 2011. In addition to working on the manuscript, Prof. MacKinnon engaged in the following activities:

- meeting with the DVC: Academic and Dean Faculty of Health and Environmental Sciences;
- lunch meeting with SUN MeDIA as contributor and reviewer;
- lunch meeting with Dr L Makhalemele, Faculty Administrator;
- dinner with the dean (Health and Environmental Sciences) and the Dean (Engineering and Technology) as well as a researcher in the faculty, Prof. K Shale. Subsequently Prof. MacKinnon visited the CRPM to view the current research activities in medical engineering;
- attended the Scholarship of Teaching and Learning (SoTL) discussion session where programme heads in the faculty presented the 2013 assessment models;
- dinner with the ECFB members of the Faculty Health and Environmental Sciences.

The draft manuscript was completed and submitted for publication in the identified journal. Since it was her eighth visit to the CUT, Prof. MacKinnon was pleased to note that the plans for restructuring of the academic portfolio were moving forward. Perhaps with smaller units, attention could be paid to creating a culture that can assist the faculty in moving forward, specifically regarding shared responsibilities, increased efforts in regard to research activities, establishing explicit expectations for academics within the units, more effective use of academic time i.e. fewer meetings and a better support structure for academics. Plans are underway for a CUT delegation to visit IUPUI in 2013. While there is no MOU between CUT and IUPUI, academics themselves are making the connections based on academic and research efforts with the guidance of Prof. MacKinnon and Prof. Friedrich-Nel. The continuous engagement demonstrates that working together on an international level can be sustainable.

When Prof. MacKinnon returns in 2013, we plan to use the data collected at the IUPUI on student perspectives, add to this the CUT postgraduate student perspectives, and then write another article.

### FACULTY: HUMANITIES



**3 1 1 1 1 1** 

Papers published in accredited journals

- Ngidi, DP. (2012). Educators' understanding of the mediation role in the classroom. *Africa Education Review*, 9(2):344-359.
- Matoti, SN & Shumba, A. (2012). Assessing the writing efficacy of undergraduate students at a University of Technology in South Africa. The Anthropologist: International Journal of Contemporary and Applied Studies of Man, 14(2):131-139.

- Odora, RJ. (2012). Employers' perceptions regarding the quality of technical education and training in Southern Africa: A case of the Botswana Technical Education Programme. *Journal of the New Generation Sciences.*
- Matoti, SN & Junqueira, KE. (2012). An assessment of Student Teachers' Experiences of Work-integrated Learning at a South African Institution of Higher Learning. *Journal* of Social Sciences, 31(3):261-269.
- Matoti, SN. The impact of the leadership and management of host schools on the construction of professional identity of teacher trainees. *Journal of Educational Studies*, 10(2):107-119.
- Setlalentoa, WN. (2012). Barriers to the implementation of Whole School Evaluation at selected primary schools in the southern Free State. *Journal of Social Sciences*, 31(2):235-243.

- Shumba, A, Ndofirepi, A & Musengi, M. (2012). An exploratory study of corporal punishment by teachers in Zimbabwean schools: Issues and challenges. International Journal of Education Sciences (IJES), 4(3):279-287.
- Chireshe, E, Shumba, A & Chireshe, R. (2012). Witchcraft and Social Life in Zimbabwe: A Review. *Studies of Tribes and Tribals*, 10(2):163-172.
- Shumba, A & Naong, M. (2012). Factors Influencing Students' Career Choice and Aspirations in South Africa: Issues and Challenges. *Journal of Social Sciences*, 33(2):169-178.
- Musengi, M, Shumba, A & Ndofirepi, A. (2012). Rethinking education of deaf children: Challenges and opportunities for teacher education. *Journal of Deaf Studies and Deaf Education*, 17(4):1-13. DOI: 10.1093. Impact Factor = 1.017
- Mapfumo, J, Shumba, A, Zvimba, R & Chinyanganya, P. (2012). Sexual activity and prevalence of multiple sexual relationships among female students in a university in Zimbabwe. *The Anthropologist*, 14(5):383-391.
- Shumba, A, Shumba, J & Maphosa, C. (2012). Mentorship of Student Teachers on Teaching Practice: Who Mentors Who in Zimbabwean Schools? Journal for New Generation Sciences, 10(1):148-169.
- Mpofu, J & Shumba, A. (2012). Challenges Faced by Students with Special Educational Needs in Early Childhood Development Centres in Zimbabwe as perceived by ECD trainers and parents. *The Anthropologist*, 14(4):327-338.
- Tchombe, TMS, Shumba, A, Lah Lo-oh, J, Gakuba, TO, Zinkeng, M & Teku, TT. (2012). Psychological undertones of family poverty in rural communities in Cameroon: Resilience and coping strategies. South African Journal of Psychology, 42(2):232-342.
- Mpofu, J & Shumba, A. (2012). Perceived Challenges faced by visually impaired students in Open and Distance Learning institutions in Zimbabwe. *Journal of Social Sciences*, 31(2):127-135.
- Mpofu, J & Shumba, A. (2012). The Zimbabwe Patients' Charter of Rights: Effects on health care access by people with disabilities living with HIV and AIDS. *Journal of Human Ecology*, 38(2):135-144.
- Musengi, M & Shumba, A. (2012). Stakeholders' perceptions of abuse of children with disabilities at a special school in Zimbabwe.

The International Journal of Children's Rights, pp.1-19.

- Shumba, A & Mawere, D. (2012). The Impact of the Brain Drain on Institutions of Higher Learning in Zimbabwe: Issues and Challenges. International Migration, 1468-2435. Doi:10.111/j.1468-2435.2012.00749x.
- Shumba, A, Ndofirepi, A & Gwirayi, P. (2012). A Critique of Constructivism as Epistemology and Learning Theory. *Journal of Social Sciences*, 31(1):11-18.
- Ndofirepi, AP & Shumba, A. (2012). Reasonable children, reasonable citizens: The contributions of Philosophy for Children to post-apartheid South Africa. *Journal of Social Sciences*, 30(3):251-261.
- Ndofirepi, AP & Shumba, A. (2012). Disputed yet Invaluable: Philosophical Inquiry as Theory in Educational Research. *The Anthropologist:* International Journal of Contemporary and Applied Studies of Man, 14(2):141-148.
- Phindane, P. (2012). The representation of female characters in Khaketla's texts: A literary analysis of three texts. *South African Journal of African Languages*, 32(2).
- Setlalentoa, WN. (2012). Can social communication be used as a strategy to enhance teaching and learning of Life Science? Perceptions of student teachers. Paper accepted for publication. *Communitas* 17.
- Badenhorst, JW and Badenhorst, BP. Die sosio-politieke sienings van Suid-Afrikaanse universiteitstudente. Journal for Contemporary History.
- Thabane, WR & Selesho, JM. (2012). Perspectives on the functioning of an effective school attended by learners from rural school. *Studies in Tribes & Tribals*, 14(2):117-122.
- Selesho, JM. (2010). Perception of high school learners towards teaching as a profession. *Journal of Educational Studies*, 10(1):49-67.
- Selesho, JM. (2011). Assessing the impact of teaching practice through reflective practice. *Journal of Educational Studies*, 9(2):151-165.
- Monyane, TS & Selesho, JM. Difficulties Regarding the Implementation of the Revised National Curriculum Statement. International Journal of Contemporary and Applied Studies of Management, 14(1):81-85.
- Selesho, JM and Imenda, SN. Quality Assurance Policy Framework and mechanisms in former technikons. *African Journal of Business Management*, 6(1):160-168.

- Selesho, JM. Poverty and HIV/AIDS. Do They Relate? An Ecological Issue. *Journal of Human Ecology*, 37(1):9-12.
- Selesho, JM. Making a Successful Transition during the First Year of University Study: Do Psychological and Academic Ability Matter? *Journal of Social Sciences.*
- Selesho, JM. What were the strong and weak points emanating from the management of quality assurance in the former technikons? International Journal of Contemporary and Applied Studies of Management.
- Selesho, JM & Imenda SN. he SERTEC legacy: what were the quality assurance practices perceived to be most effectiveness in former technikons? International Journal of Contemporary and Applied Studies of Management.
- Kola, MI & Selesho, JM. The Role of the Academic Heads of Departments in the Strategic Planning of the University. International Journal of Contemporary and Applied Studies of Management.
- Selesho, JM. The Challenge Faced by Higher Education Institutions: A Quality Agenda. *Journal of Social Sciences.*
- Selesho, JM. Factors That Influence the Performance of Accounting at First Year Level. *Journal of Social Sciences.*
- Selesho, JM. Quality Assurance Perception as a Transformational Process in South Africa Higher Education Institution. *Journal of Social Sciences*.
- Selesho, JM & Modise, S. Strategy(ies) in dealing with HIV/AIDS in our schools: changing the lenses. *Journal of Human Ecology*,
- Selesho, JM & Monyane TS. (2012). Analyzing views of intermediate phase educators with regard to the challenges and their experiences of the RNCS. International Journal of Contemporary and Applied Studies of Management, 14 (2):107-112.

### Papers accepted for publication in accredited journals

- Dr SRS Litheko. The application of e-Learning in Teacher Education at the Central University of Technology, Free State. Paper submitted to Journal of Educational Studies.
- Matoti, SN, Junqueira, KE & Odora, RJ. Assessing the teaching efficacy beliefs of teacher trainees: A comparison of two institutions of higher learning in South Africa. Paper accepted for publication by the Africa Education Review.
- Dr SRS Litheko. The introduction of the new Further Education and Training (FET) System at Technical Colleges in South Africa and the impact thereof. Paper submitted to the *Journal of Social Sciences*.
- Dr SRS Litheko. The difference in performance between schools in the urban areas and those in the rural areas. Paper submitted to *Electronic Journal of Inclusive Education.*
- Selesho, JM. Attitudes of student teachers towards inclusion of learners with special educational needs in the mainstream. *Journal of Education Studies.*
- Selesho, JM. Predictive validity of first year students at University: A quality assurance dilemma. *Journal for New Generation Sciences.*
- Selesho, JM. Self-evaluation as a transformational process towards institutional quality process: turning the tide. South African Journal of Higher Education.
- Selesho, JM. Inclusion of learners in the mainstream: Ecological niche. *Journal of Social Sciences*.
- Selesho, JM. Reflection on the quality of teacher education professional thinking as reflected by pre-service teachers. *Gyan Journal Education.*
- Selesho, JM. Staff retention as a human resource factor: A case of three universities. South African Journal of Human Resource Management.
- Odora, RJ. Adolescents' career aspirations: the influence of role models, socio-economic environment and career information. *Journal* of Arts and Sciences

# Papers presented at international conferences

- Matoti, SN. Approaches to studying and learning by science students. Paper presented at the ICERI conference held in Madrid, Spain, 19 – 21 November 2012.
- Odora, RJ. Presented a paper at the ICERI2012 conference held in Madrid, Spain, 19 – 21 November 2012.
- Ncontsa, V & Shumba, A. (2012). The nature, causes and effects of school violence in South African high schools. Paper read at the 5<sup>th</sup> International Conference on Education, Research and Innovation held in Madrid, Spain, 19 – 21 November 2012.
- Shumba, A. (2012). Nature and extent of child sexual abuse by teachers in Zimbabwe. Paper read at the 8<sup>th</sup> Congress: British Association of the Study and Prevention of Child Abuse (BASPCAN) Congress held at Queen's University Belfast, Northern Ireland, UK from 15 – 18 April 2012.
- Shumba, A. (2012). The nature and extent of the brain drain in Zimbabwe. Paper read at the IJAS Conference held at Ananas Hotel, Vienna, Austria from 1 – 5 April 2012.
- Mr Zwane presented a paper titled "Preparedness of first year students at a University of Technology in South Africa" at Hawaii International conference in Education, 2-12 January 2012.
- Dr SRS Litheko presented a paper titled "The difference in performance between schools in the urban areas and those in the rural areas" at Hawaii International conference in Education, 2-12 January 2012.
- Dr SRS Litheko presented a paper at the CICE conference held in Toronto from 21 to 25 June 2012.
- Mr M Letuka presented a paper at the CICE conference held in Toronto from 21 to 25 June 2012.
- Dr SN Matoti presented a paper at the IJAS conference held in Vienna from 2 to 5 April 2012.
- Matoti, SN. Approaches to studying and learning by science students. Paper presented at the ICERI conference held in Madrid, Spain from 19 – 21 November 2012.

- Odora, RJ. Presented a paper at the ICERI2012 conference held in Madrid, Spain.
- Dr W Setlalentoa presented a poster at the ICERI2012 conference which was held in Madrid, Spain.



- Musengi, M & Shumba, A. (2012). Including the excluded?: Deaf pupils in mainstream high schools in Zimbabwe. Paper presented at the 39th SASE Annual International Conference held at Great Zimbabwe University, Great Zimbabwe Hotel, Masvingo, Zimbabwe, 4 – 6 October 2012.
- Mpofu, J & Shumba, A. (2012). Inclusive education in a peri-urban school district: perceptions of parents and teachers. Paper presented at the 39th SASE Annual International Conference held at Great Zimbabwe University, Great Zimbabwe Hotel, Masvingo, Zimbabwe, 4 – 6 October 2012.
- Prof. DP Ngidi presented a paper at the SASE Conference in Zimbabwe, 4 – 6 October 2012.
- Prof. A Shumba presented a paper at the SASE Conference in Zimbabwe, 4 6 October 2012.
- Dr M Motseke presented a paper at the SASE Conference in Zimbabwe, 4 – 6 October 2012.
- Dr F Naude presented a paper at the SASE Conference in Zimbabwe, 4 – 6 October 2012.
- Mr W Viljoen presented a paper at the SASE Conference in Zimbabwe, 4 – 6 October 2012.
- Mr T Seipobi presented a paper at the SASE Conference in Zimbabwe, 4 6 October 2012.
- Mr L Papi presented a paper at the SASE Conference in Zimbabwe, 4 6 October 2012.
- Mr Manduna presented a paper at the SASE Conference in Zimbabwe, 4 6 October 2012.
- Mrs M Roodt presented a paper at the SASE Conference in Zimbabwe, 4 – 6 October 2012.
- Mr G Beukes presented a paper at the SASE Conference in Zimbabwe, 4 6 October 2012.
- Shumba, A & Chireshe, R. (2012). Education in Zimbabwe. Paper presented at the Second Scramble for African Conference on *The*

African Union after a Decade: Putting African Unity First Means Putting Humanity First held at DIRCO OR Tambo Building, Rietondale, Tshwane, Gauteng, South Africa on 23 – 25 May 2012.

- Dr Setlalentoa, Mrs Lekhu and Mr Phage attended a workshop by Prof. Elias Mpofu on Writing for Publication at CUT in Bloemfontein from 23 to 25 October 2012.
- Mr Komati and Mr Sebate attended a Laboratory Safety Workshop at Birchwood, East Rand from 25 – 26 October 2012.
- Mr Phage attended a workshop in Scientific Research Writing at North-West University, Potchefstroom in September 2012.
- Mr Moliko and Mr Thabane presented a paper at the EASA conference held in January 2012.
- Dr J Badenhorst presented a paper at the Education Association of SA conference in Port Elizabeth in January 2012.
- Dr MJ Motseke presented a paper at the Education Association of SA conference held in Port Elizabeth in January 2012.
- Dr B Khoboli presented a paper at the UMALUSI conference in Pretoria in May 2012.
- Mr Phage presented a paper at The Best of Both Worlds conference held at Klein-Kariba Lodge in Belabela, Limpopo from 16 April to 20 April 2012. The paper, co-authored with Dr Maimane, was entitled "Addressing education for sustainable development of underprivileged community through remedial classes".
- Matoti, SN and Junqueira, KE. Presented a paper at the International Conference on Teaching Practice in Education (ICTPED) at UNISA from 6 to 8 August 2012.
- Mr W Manduna presented a paper at an SATN conference held in Namibia.
- Mr Moliko presented a paper at a conference on Early Childhood Education at Rhodes University: 10 to 14 September 2012.
- Mrs Roodt, Mr Beukes, Mr Viljoen and Dr Motseke presented papers at the SASE conference in Zimbabwe in October 2012.
- Dr W Setlalentoa presented a poster entitled: Preparedness of Foundation Phase educators to teach Numeracy (Mathematics) and Science: An evaluation of current training at a conference on Early Childhood Education. Rhodes University, 10 to 14 September 2012
- Mr Komati attended the Grahamstown Science Festival at Rhodes University, 15 to 17 March 2012.

- Mr Komati, Mr Letloenyane and Mr Sebate attended a Laboratory Leadership, Instrument and Materials Management workshop on 14 and 15 May 2012 held in Boksburg.
- Ms Ndamani attended a PhD workshop in Johannesburg on 29 August 2012.
- Dr Litheko, Dr F Naude, Ms Ndamani and Ms Lekhu attended a workshop on post-graduate supervision at Stellenbosch from 5 September to 7 September 2012.
- Dr SN Matoti and Dr W Setlalentoa attended a conference on Women Leadership in Academia.
- Dr B Khoboli was invited as a guest speaker by AMC International during their 2012 Summit on Improving Mathematics, Science & Technology in Basic Education. He also attended a seminar on Community Engagement in higher education at North West University.
- Ms L Mogashoa attended a workshop on Writing for Publication at the Farm Inn in Pretoria.
- Dr Setlalentoa, Mrs Lekhu and Mr Phage attended a workshop by Prof. Elias Mpofu on Writing for Publication at CUT in Bloemfontein from 23 to 25 October 2012
- Mr Komati and Mr Sebate attended a Laboratory Safety Workshop at Birchwood, East Rand from 25 to 26 October 2012.
- Mr Phage attended a workshop in Scientific Research Writing at North-West University, Potchefstroom in September 2012.
- Mr Mafaralala and Mr Mochichane attended a workshop/conference on ICT in Johannesburg.
- Mr PA Lemeko delivered a paper at the SASE Conference at the Great Zimbabwe University (4 to 6 October 2012).
- Mr Koai attended the SATI conference on the Role of Translation in Language Development at the University of Johannesburg on 29 September 2012. He also attended the Creative Writing workshops held by Professor Zakes Mda.
- Miss Louw attended the SATI conference on the Role of Translation in Language Development at the University of Johannesburg on 29 September 2012. She also attended the Creative Writing workshops presented by Professor Zakes Mda.

# Eskom efficient lighting design competition

## Sasol new signatures 2012 competition



The Eskom Efficient Lighting Design Competition was hosted by the Graphic Design Programme in the Art Gallery at the Central University of Technology, Free State for the Free State regional exhibition where all students from tertiary institutions, universities, colleges, design centres and schools of design in the Free State displayed their entries. From ALL entries in the Free State, one finalist was chosen as participant in the final competition in November 2012. We are proud to announce that this finalist is a Graphic Design student from our programme, Erick Strydom. He also won a cash prize of R5 000. At the national finals, he won second prize and received R20 000 and an Apple Ipad.



Erick Strydom with his entry



The Graphic Design Programme was proud to have a student as a finalist in the *Sasol New Signature 2012* competition for emerging young artists. This competition is presented annually in collaboration with the Association of Arts, Pretoria. The competition is now in its 23<sup>rd</sup> year. Erick Strydom, a third year Graphic Design student, was selected as a finalist and presented the Graphic Design Programme of the CUT at the Pretoria Art Museum.



The mixed media project by Erick Strydom

#### IPSA student gold pack awards 2012

The competition is open to any registered tertiary education student, in particular in the three disciplines of Packaging Technology, Graphic Design and Food Science & Technology. It provides students with a unique opportunity to demonstrate their excellence and creativity in developing packaging solutions and concepts.

- Two students from the Graphic Design programme were chosen as finalists in the design and packaging categories. They attended the gala function in Johannesburg during October 2012. We are very proud of Nineve van Zyl and Erick Strydom.
- In the Graphic Design Category, Erick Strydom, CUT Graphic Design student, was the winner with his design for 'lconic Beverage Packaging'. His outstanding packaging concept showcased four Steri-Stumpie (flavoured milk soft drink) containers grouped together by a packaging mechanism to represent the udder of a cow. The judges recognised the on-pack communication and humorous implementation of the bar code (which was in the shape of a cow), as well as his innovative and clever use of shapes and forms.
- Update on UNODA (United Nations Office for Disarmament Affairs) project

The website for the project was finalised and the design sent to UNODA for approval. On approval of this project, multimedia components were added to the website. These components will make the website one of the most technologically advanced sites on the Internet. Due to the fact that the website is regarded as a breakthrough educational website, the official opening of the website has been delayed in order to make sure that the website functions from all known devices and is accessible to users with disabilities. We will know the final launch date once the website with the components has been approved.

# Research activities in the faculty

- Thirteen staff members of the SCS, Welkom campus attended the *Integration of Content* and *Language* lecture in Bloemfontein.
- Dr SM Moeketsi registered for the PGCE at CUT.
- Dr BP Badenhorst co-authored an article that was published in an accredited journal. The title of the article is: *Student teacher's views* on the quality of Mentoring and Teaching *Practice in Township Schools.* He also codelivered a paper on the aforementioned article at the EASA conference held from 16 to 20 January 2012 in the Eastern Cape.
- Dr Badenhorst was an external examiner for a Master's dissertation: Motivation, Attitude, and English Language Proficiency in the *Monash South Africa Foundation Programme* at the University of Pretoria.
- Mr Walter Molefe is registered for his MTech Language Practice.
- Mr Papi Lemeko obtained his BTech Language Practice during the Autumn graduation in March 2012.
- Dr M van Deventer took part in an International Survey on Emotional Intelligence.
- Dr Delport attended workshops on Data and Referencing Works (22 March 2012) and she attended a research workshop on the 23 March 2012.
- Mr Fredericks and Mr Koai attended a workshop (24 March 2012) on questionnaire development held by Professor Michael Van Wyk from Unisa.
- Mr Jonathan Crowther, former Editor of Volksblad, presented a guest lecture (23 March 2012) to Language Dynamics III students about the Protection of Information Bill. He was invited by Dr M Delport.
- Mr Kleynhans is involved in the Sustainable Development Project at the CUT and will be implementing a number of initiatives in the School of Communication Sciences.
- Mr Fredericks is registered for a DTech in Language Practice.

- Mr M Koai and Miss C van Vuuren are registered for their MTech degrees in Language Practice.
- Dr M Delport is co-supervising a student with the University of the Free State.
- Ms T van Vuuren attended Respondus Training on the 25 May 2012. She also attended the SARIMA 7 Imperatives to Succeed in Research workshop held on the 29 May 2012, as well as the Assessment workshop on the setting of assessment papers on 6 June 2012.
- Mr Kleynhans is involved in the Sustainable Development Programme and the *Speak Out* competition in collaboration with the *Department* of *Social Development*. He was also involved with the Belgium Exchange students.
- Dr M Ferriera has made a contribution to a book that has been published.
- Mr B Fredericks has been invited by Oxford University Press (OUP) to co-author a Communication Skills textbook for engineering students. He also participated in the Winter School held at the CUT, FS during the June holidays.
- Dr Moeketsi attended an UMALUSI workshop from 2 to 5 July. The aim of the workshop was to analyse the new instrument which will be used to analyse Languages in Grade 12. He is also waiting for comments on a manuscript sent to SAFOS, an accredited journal.
- Mr W Molefe attended an e-learning training session held by the Centre for Learning and Educational Technology. He is also scheduled to present a paper at a national conference organised by ALASA at the University of Venda, Limpopo. The title of the paper is: Unpacking indigenous language as emancipatory tool: Language Media.
- Dr B Badenhorst is participating in the *GENtle* Africa research project on Generation Studies together with researchers from UNISA, Stellenbosch and the UP. He also acted as external examiner for the University of Limpopo (PGCE).
- Mrs N Venter has been appointed as lecturer for English and Afrikaans in the School of Communication Sciences. She commenced duty on 1 July 2012.
- Dr M Delport was awarded the Vice-Chancellor's Early Teaching Career Award. She attended one of the workshops on Creative Writing presented by Professor Zakes Mda.

She is the main co-ordinator of the School of Communication Sciences Industry Day that is now going to be an annual event on the Schools calendar.

- Mr J Kleynhans is actively involved in the Sustainable Development Programme at the CUT.
- Dr M van Deventer attended the Creative Writing workshops presented by Professor Zakes Mda. She also liaised with Mr Bruno regarding the Language Practice programme that he heads at the University of Mechelen, Belgium.
- Mrs S Ngidi attended the 6<sup>th</sup> Annual Faculty of Arts conference held on 2 and 3 October 2012 at the University of Zululand. The theme of the conference was: 'What does it mean to be human?' She also attended the Creative Writing workshops presented by Professor Zakes Mda.
- Mr Fredericks examined a Master's dissertation during the third term. He is coauthoring a Communication Skills textbook for engineering students. This is being done in collaboration with four other lecturers from universities in South Africa. The work is being done for Oxford University Publishers. He also attended a seminar on the OECD report: "Higher Education in Regional and City Development, Free State South Africa.
- Dr BP Badenhorst co-authored an article Die demokrasie onder druk: Die sosiopolitieke sienings van Suid-Afrikaanse Universiteitstudente which will appear in the accredited Journal for Contemporary History. He presented a training session on CAPS to learning facilitators of the Free State Education Department at Aldam.
- Dr BP Badenhorst also acted as external examiner for the University of Limpopo (PGCE). He acted as external examiner for a thesis from the University of Pretoria as well as honours examinations in Applied Linguistics.
- Dr Badenhorst also acted as adjudicator for the Journal for New Generation Sciences.
- Mrs Ngidi attended the 2<sup>nd</sup> SASEE workshop at the CUT, FS on 1 November 2012. Theme of conference: Innovation in Teaching and Learning at Universities.
- Mr Koai attended the *Large Class Teaching* workshop on 7 November 2012.

- Dr M Delport was responsible for the planning of the Communication Sciences Industry Day held during the 4<sup>th</sup> term. It was a resounding success and positive feedback was obtained from students and lecturers as well as guests who attended the event.
- Mr Fredericks and 2 students from the Language Practice Department went to Belgium during the 4<sup>th</sup> term. They are involved in a project entitled *The Power of Stories*. This is in collaboration with Thomas More University College in Belgium, the University of the Free State and the National Museum in Bloemfontein.
- Ms T van Vuuren was invited by the Higher Education Department of Oxford University Press to co-author a new communication textbook to be published September 2014, tentatively entitled "Business Communication", for them. She will be writing 2 chapters, namely Organisational Communication and Stakeholder Communication. In addition, she also reviewed a manuscript for them during the course of the 4<sup>th</sup> term.

Personnel on editorial boards or who acted as reviewers for peer reviewed journals and external examinations

- Prof. G Schlebusch acted as external moderator for B Ed (Hons) papers of Walter Sisulu University, as well as undergraduate papers of North West University.
- Dr AM Rambuda acted as external examiner for a B Ed (Hons) paper of the North-West University.
- Dr BP Badenhorst acted as external examiner for the University of Limpopo (PGCE).
- Dr V Moeketsi acted as an Analyst for Sesotho Home Language. He was once more invited by UMALUSI to analyse the question papers for Grade 12, 2012. His team's recommendations will be made available to Grade 12 examiners very soon.
- Dr Setlalentoa reviewed a paper for the JNGS.
- Dr SN Matoti examined a Master's degree for the University of Kwa-Zulu Natal (KZN).
- Dr SRS Litheko reviewed an article for the South African Journal of Education.
- Dr SRS Litheko examined two Master's dissertations for the University of Fort Hare and one for University of Limpopo.
- Prof. G Schlebusch serves on the Editorial Board of 'The Qualitative Report' – online electronic journal.
- Prof. G Schlebusch acted as reviewer of article for accredited journal: Acta Academica.
- Prof. G Schlebusch examined a Ph D thesis from Nelson Mandela Metropolitan University.
- Prof. G Schlebusch examined an M Ed dissertation from UNISA.
- Dr J Badenhorst reviewed an article for the JNGS.
- Dr J Badenhorst acted as external examiner for a Master's dissertation at the University of South Africa.
- Dr J Badenhorst acted as external examiner for a Master's dissertation at the University of the Free State.

- Dr SRS Litheko has been appointed as external examiner for three modules in Educational Management by the University of Limpopo.
- Dr J Selesho has been appointed as external examiner for five modules in Subject Methodologies by the University of Limpopo.
- Dr J Selesho examined three M Ed dissertations from University of Venda and one from University of Limpopo.
- Dr J Selesho is on the Editorial Board of Journal of Education Studies and acted as reviewer for three articles.
- Odora, RJ reviewed two articles for the JNGS and SAJE, respectively.
- Dr SN Matoti examined a Master's degree for WSU.
- Prof. G Schlebusch examined a Master's degree for UFS.
- Prof. G Schlebusch is on the Editorial Board of 'The Qualitative Report" – online journal.
- Dr SRS Litheko moderated examination scripts from Venda.
- Dr W Setlalentoa peer reviewed an article for Journal of Human Ecology. August 2012.
- Dr SN Matoti reviewed a paper for Africa Education Review.
- Dr B Khoboli reviewed one paper for The Systematic Practice and Action Research and another one paper for Journal for New Generation Sciences.
- Dr Khoboli was also appointed external examiner for a Master's research thesis from the University of Newcastle (Australia).
- Prof. G Schlebusch acted as external moderator for B Ed (Hons) papers of Walter Sisulu University, as well as undergraduate papers of North-West University.
- Dr AM Rambuda acted as external examiner for a B Ed (Hons) paper of the North-West University.

## Research seminar for academic staff

- The Faculty of Humanities held a Research Colloquium for students on 11 October 2012.
- The Faculty of Humanities held a Prestige Research Seminar on 17 October 2012.
- Prof. A Shumba held a Research Workshop on 23-25 October 2012.



| Staff Member                                  | Reporting quarter 2012  |                   |
|---|-------------------------|-------------------|
|   | Institution             | Amount<br>(Rands) |
| Dr SN Matoti<br>(For Ms Ndamani and Ms Lekhu) | NRF                     | R25 000.00        |
| Prof. A Shumba                                | NRF Rated<br>Researcher | R40 000.00        |

#### FACULTY: MANAGEMENT SCIENCES



Prof. A Strydom – Dean: Faculty of Management Sciences

The Faculty of Management Sciences is making steady progress towards increasing its research outputs and involvement. As part of the faculty's research plan and structure, and to increase the coordination of the various research activities, a number of research clusters were identified. The research clusters represent a broad outline of the various research focus areas in the faculty.

The research clusters include:

- 1. Entrepreneurship and Project Management
- 2. Business Management and Leadership
- 3. Public Sector Service Delivery
- 4. Research Education (inter-faculty)
- 5. Corporate Governance
- 6. Ethics and Social responsibility
- 7. Tourism and Leisure Studies
- 8. Food and nutritional issues (inter-faculty)

In 2012, twelve staff members were responsible for 12.65 credit outputs in accredited journals and 23 papers were delivered at national and international conferences. The faculty also awarded five Master's and two Doctoral degrees – one of which was awarded to Alexander Gröhmann, associated with Aalen University in Germany. We are proud that our international connections produce viable outputs. Three staff members obtained degrees from other universities: Mrs Grobbelaar – Magister Commercii in Business Management from the University of the Free State; Mr Taylor obtained an MBA from the University of the Free State, and Mr Ramphoma completed his Master's in Economics at the North-West University.

Professor Van Niekerk delivered a key note address for The Local Government Indabas: the Master class for Mayors, Councillors and Managers on Municipal Governance, MFMA and best practices in municipalities in Durban. Prof. Kokt was part of the steering committee for the 12<sup>th</sup> North-eastern Decision Sciences Institute's (NEDSI) Bali Conference and Profs Lategan and Dzansi acted as session chairs at the HELTASA conference in Stellenbosch.

Two book contributions on issues in government management were published by Prof. Tryna van Niekerk and Mr Arko-Cobbah and Dr Olivier, respectively. A book entitled *Seven Imperatives for success in research* was also published by Profs Holzbaur, Lategan and Kokt. Dr Karen Dyason was also part of the project, which was sponsored by the South African Research and Innovation Management Association (SARIMA).

The annual Prestige Research Seminar for the Faculty of Management Sciences was hosted on 25 October 2012. The guest speaker was Professor Dave Lubbe, professor in Accounting of the University of the Free State. His address was entitled 'Research in Economic and Management Sciences: An overview'. Prof. Lubbe emphasised the importance of research as an integral component of an academic's career and the importance of making a contribution to one's field of study. He reflected on the challenges of doing research and cited some best practices from his own experience as researcher. Two prizes were awarded, one for best research and one for best presentation. These were awarded to Mrs Lisa-Marie Couglan and Mrs Chrizaan Grobbelaar, respectively.



Pictured from left are Mrs Chrizaan Grobbelaar who won the award for best presentation, Mrs Lisa-Marie Couglan who won the award for best researcher, Professor Albert Strydom (Dean: Faculty of Management Sciences) and Professor Desere Kokt (Chairperson of the Faculty Research Committee).





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