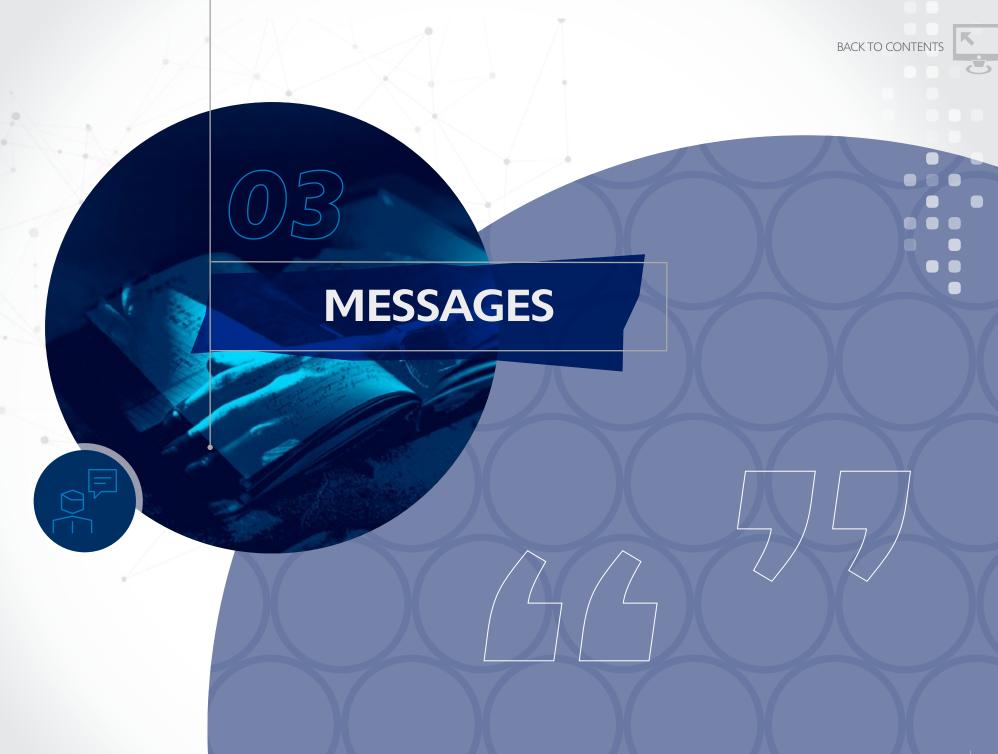
RESEARCH INNOVATION @UNISA

2017

Define tomorrow









FOREWORD

BY THE PRINCIPAL AND VICE-CHANCELLOR

Professor Mandla S Makhanya

Now, more than ever before, the global higher education community is struggling to make sense of an environment that is being buffeted from all sides by a host of socioeconomic and political forces and influences that are shaking the very foundations of this 900-year-old industry.

Yet, ironically, there has never been greater pressure on higher education to contribute to global sustainability. Indeed, the Sustainable Development Goals (SDGs) 2016 make specific mention of higher education as a vehicle for transformation and sustainability, noting that this can and should be done by harnessing the affordances of technology. This brings institutions such as the University of South Africa (Unisa) squarely to the forefront as key drivers of national, continental and global transformation and sustainability.

In this context, research, postgraduate studies, innovation and commercialisation assume an ever-growing importance. Pleasingly, Unisa's aggressive programme of opportunity, incentivisation and development, especially of young, black and women researchers, is bearing fruit, with measurable progress across all fronts. Furthermore, the deliberate growth in research outputs and collaborations, the growing numbers of endowed chairs, the strengthening role of the university as the leading provider of postgraduate programmes in Africa, and investment in innovation and commercialisation projects, to name but a few, all point to a vibrant and engaged research-focused university.

This report sets out the progress and achievements in the Research, Postgraduate Studies, Innovation and Commercialisation Portfolio for 2017. I am pleased to endorse the report and I would like to commend the efforts of all staff who have contributed to the successes of 2017.



MESSAGE FROM THE ACTING VICE-PRINCIPAL: RESEARCH, POSTGRADUATE STUDIES, INNOVATION AND COMMERCIALISATION

Professor Thenjiwe Meyiwa

Research at Unisa continues to show positive growth, in line with national directives and international best practice and benchmarks.

This is evident from the most recent benchmarking analysis of the Department of Higher Education and Training (DHET), based on the 2016 research output, which 25 public universities reported in May 2017. Unisa had the seventh-highest overall publication output, with a share of 7,55%, which is an extremely creditable performance. We also performed significantly above average in terms of academics with master's degrees or PhDs as their highest qualifications, coming in eighth out of the 25 universities evaluated.

Further testimony to the growing research strength of the university was the awarding by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) of two chairs to Unisa in 2017. In June 2017, Unisa's Professor Hasina Ebrahim became a joint holder of the UNESCO Chair in Early Childhood Education, Care and Development, which is shared with Professor Alan Pence of the University of Victoria in Canada. Towards the end of that year, the UNITWIN/UNESCO/Unisa Chair in Open and Distance Learning (ODL) was awarded to Unisa under the Chair Professor Moeketsi Letseka, cementing Unisa's position as Africa's largest university, a significant role player within ODL research and one of the mega-universities of the world.

Other achievements in Research and Innovation at Unisa for 2017 were the granting to Unisa of our first two patents, the awarding of R1, 36 million in seed funding to Unisa projects from the Technology Innovation Agency and the National Research Foundation's awarding of 39 ratings to Unisa researchers, including A ratings to Professor David Glasser and Professor Anthony Reddie.

These achievements and the calibre and commitment of our researchers generally, stand Unisa in good stead as we continue on our path of using Research and Innovation to help address development challenges and make the biggest impact possible on higher education in South Africa and beyond.

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RESEARCH DASHBOARD



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Research & Innovation @ Unisa 2017 6



RESEARCH **DASHBOARD**

RESEARCH OUTPUTS

Through research we expand our knowledge and get a clearer understanding of the universe's workings and mysteries. But, research is also an opportunity to make a difference and assists in solving real-world problems and Unisa's research agenda is informed by the needs of our country and the challenges our continent are facing. The university's research efforts culminate and are shared in published research findings and the completion of postgraduate degrees.

A dedicated research portfolio, clear research strategy and significant investments in resources and support for researchers all work together to stimulate and enhance Unisa's research performance. about research.

RESEARCH OUTPUT SUMMARY

Unisa's total weighted research outputs indicate a 10.1% increase over the 2016 figures. This increase is also

reflected in the table below, depicting the weighted outputs per capita of 1.63 in 2016.

Table 1: Comparative research dashboard indicators

| Research output metrics | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | Increase/ decrease (2015 -2016) |
|---|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|--|
| | Actual | Position | |
| Total weighted research output | 1669,33 | 7th | 1947,04 | 7th | 2563,84 | 6th | 2546.6 | 6th | 2917,13 | 6th | 14.4 |
| Publication output | 892,52 | 6th | 1030,04 | 7th | 1172,84 | 6th | 1328.60 | 6th | 1374.13 | 6th | 3.4 |
| Weighted output per capita | 1,05 | 13th | 1,19 | 13th | 1.49 | 12th | 1.48 | 12th | 1.63 | 11th | 10.1 |

Note: Position indicates Unisa's ranking when compared with other higher education institutions in South Africa



MASTER'S AND DOCTORAL OUTPUTS

To build a knowledge-based economy South Africa has to increase its number of high-level qualifications. The NDP 2030 has set a target of 100 doctoral graduates per one million of the population by 2030. This would translate into 5 000 PhD graduates per annum in 2030.

In 2017, Unisa performed well by delivering no fewer than 1 220 master's and doctoral graduates.

Table 2: Publication output breakdown

| Publication | 2013 | 2014 | 2015 | 2016 | *2017 |
|------------------------|--------|---------|---------|---------|---------|
| Journals | 923.70 | 1027.67 | 1165.74 | 1118.63 | 1108.11 |
| Books/Book Chapters | 38.21 | 66.56 | 78.28 | 268.17 | 210.25 |
| Conference Proceedings | 68.13 | 78.61 | 98.73 | 93.58 | 66.78 |

*Research outputs submitted 2017

Table 3: Master's and doctoral graduations by college, 2013 to 2017

| College and level | 2013 | 2014 | 2015 | 2016 | 2017 |
|--|------|------|------|------|------|
| College of Accounting Sciences | | | | | |
| Doctoral degrees | 4 | 10 | 13 | 12 | 1 |
| Master's degrees | 6 | 15 | 14 | 15 | 18 |
| College of Agriculture and Environmental Sciences | | | | | |
| Doctoral degrees | 7 | 19 | 8 | 14 | 23 |
| Master's degrees | 37 | 47 | 58 | 63 | 71 |
| College of Economic and Management Sciences | | | | | |
| Doctoral degrees | 16 | 33 | 33 | 30 | 44 |
| Master's degrees | 385 | 395 | 430 | 525 | 419 |
| College of Education | | | | | |
| Doctoral degrees | 123 | 155 | 162 | 140 | 75 |
| Master's degrees | 16 | 33 | 30 | 54 | 97 |
| College of Human Sciences | | | | | |
| Doctoral degrees | 89 | 124 | 100 | 118 | 110 |
| Master's degrees | 117 | 296 | 173 | 180 | 157 |
| College of Law | | | | | |
| Doctoral degrees | 18 | 22 | 18 | 25 | 9 |
| Master's degrees | 107 | 139 | 115 | 135 | 100 |

RESEARCH DASHBOARD



| College of Science, Engineering and Technology | | | | | |
|---|------|------|------|------|------|
| Doctoral degrees | 13 | 17 | 13 | 18 | 24 |
| Master's degrees | 22 | 36 | 50 | 42 | 69 |
| Graduate School of | | | | | |
| Business Leadership | | | | | |
| Doctoral degrees | 8 | 10 | 14 | 18 | 26 |
| Master's degrees | 461 | 272 | 323 | 413 | 445 |
| College of Graduate Studies | | | | | |
| Doctoral degrees | * | * | * | * | 3 |
| Total | 1429 | 1623 | 1554 | 1802 | 1691 |

| Table 4: Master's and do | Table 4: Master's and doctoral students by race | | | | | | | | | |
|--------------------------|---|------|------|------|-------|------|--|--|--|--|
| Qualification | Race | 2013 | 2014 | 2015 | 2016 | 2017 | | | | |
| Doctoral degrees | African | 123 | 186 | 175 | 230 | 223 | | | | |
| | Coloured | 5 | 5 | 5 | 10 | 4 | | | | |
| | Indian | 9 | 13 | 16 | 14 | 9 | | | | |
| | White | 70 | 71 | 56 | 63 | 52 | | | | |
| | No information | 1 | 3 | 1 | 8 | 1 | | | | |
| Total | | 208 | 278 | 253 | 325 | 289 | | | | |
| Master's degrees | African | 685 | 890 | 913 | 1 059 | 696 | | | | |
| | Coloured | 36 | 54 | 45 | 65 | 24 | | | | |
| | Indian | 129 | 123 | 110 | 133 | 52 | | | | |
| | White | 255 | 267 | 214 | 209 | 155 | | | | |
| | No information | 17 | 38 | 29 | 25 | 4 | | | | |
| Total | | 1122 | 1372 | 1311 | 1491 | 931 | | | | |







Table 5: Master's and doctoral students by gender

| Qualification | Gender | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------|--------|------|------|------|------|------|
| Doctoral degree | Female | 82 | 93 | 86 | 133 | 113 |
| | Male | 146 | 185 | 18 | 220 | 176 |
| Total | | 208 | 278 | 253 | 325 | 289 |
| Master's degree | Female | 480 | 618 | 618 | 643 | 456 |
| | Male | 642 | 733 | 693 | 831 | 475 |
| Total | | 1122 | 1372 | 1311 | 1474 | 931 |

NATIONAL RESEARCH FOUNDATION RATING AND EVALUATION

The National Research Foundation (NRF) evaluation and rating system judges the standing of individuals on the basis of their research outputs. In this respect it differs from often used rating and ranking systems that judge the standing of individual publications (impact factors) or the university in its entirety (university rankings).

There is a growing participation in the NRF evaluation and rating system not only by South African higher education researchers, but by researchers from all over the world. The rating system gauges researchers' standing in relation to other researchers in their disciplines. There are four main rating categories:

A RATING:

Researchers who are unequivocally recognised by their peers as leading international scholars in their field for the high quality and impact of their recent research outputs.

A1 A researcher in this group is recognised by all reviewers as a leading scholar in his/her field internationally for the high quality and wide impact (i.e. beyond a narrow field of specialisation) of his/her recent research outputs.

A2 A researcher in this group is recognised by the overwhelming majority of reviewers as a leading scholar in his/her field internationally for the high quality and impact (either wide or confined) of his/her recent research outputs.

B RATING:

Researchers who enjoy considerable international recognition by their peers for the high quality and impact of their recent research outputs.

B1 All reviewers are firmly convinced that the applicant enjoys considerable international recognition for the high quality and impact of his/her recent research outputs, with some of them indicating that he/she is a leading international scholar in the field.

B2 All or the overwhelming majority of reviewers are firmly convinced that the applicant enjoys considerable international recognition for the high quality and impact of his/her recent research outputs.



NATIONAL RESEARCH FOUNDATION RATING AND EVALUATION CONTINUED

Most of the reviewers are convinced that the applicant enjoys considerable international recognition for the high quality and impact of his/her recent research outputs.

C RATING:

Established researchers with a sustained recent record of productivity in the field and who are recognised by their peers as having:

- produced a body of quality work, the core of which has coherence and attests to on-going engagement with the field
- demonstrated the ability to conceptualise problems and apply research methods to investigating them.

C1 All of the reviewers are firmly convinced that the applicant is an established researcher as described and who, on the basis of the high quality and impact of his/ her recent research is regarded by:

Some reviewers as already enjoying considerable international recognition

or

The overriding of reviewers as being a scholar who has attained a sound/solid international standing in their field, but not yet considerable international recognition or

The overriding majority of reviewers as being a scholar whose work focuses mainly on local and/or regional issues and who as a scholar at a nationally leading level has substantially advanced knowledge and understanding in the field by contributing to new thinking, a new direction and/or a new paradigm.

C2 All of the reviewers are firmly convinced that the applicant is an established researcher as described. The applicant may, but need not, enjoy some international recognition for the quality and impact of his/her recent research outputs.

C3 Most of the reviewers concur that the applicant is an established researcher (as described).

Y RATING:

or

Awarded to young researchers (40 years or younger), who have held a doctorate or equivalent qualification for less than five years at the time of application, and who are recognised as having the potential to establish themselves as researchers within a five-year period after evaluation, based on their performance and productivity as researchers during their doctoral studies and/or early postdoctoral careers.

Y1 A young researcher (within 5 years from PhD) who is recognised by all reviewers as having the potential (demonstrated by research products) to establish him/ herself as a researcher with some of them indicating that he/she has the potential to become a future leader in his/ her field



A young researcher (within 5 years from PhD) who is recognised by all or the overwhelming majority of reviewers as having the potential to establish him/herself as a researcher of

considerable international standing on the basis of the quality and impact of his/her recent research outputs.

Y2 A researcher in this group is recognised by all or the overwhelming majority of reviewers as having the potential to establish himself/herself as a researcher (demonstrated by recent research products).

RESEARCH DASHBOARD



NRF-RATED RESEARCH AWARDS

A total of 52 NRF-rated awards including new, re-rated and researchers who joined with a rating were presented in 2017. This figure was made up of 9 Y-rated researchers, 7 B-rated researchers, and 36 C-rated researchers. At the end of 2017, Unisa had 207 rated researchers.

| Title | Surname | Name | College | School/Department | Rating | Status |
|-------|------------|-----------|---------|--|--------|-------------------------|
| Prof. | Dedering | Tilman | CHS | History | B2 | Re-rating |
| Prof. | Liebenberg | Elri | CAES | Geography | B2 | New |
| Prof. | Adesina | Jimi | CGS | Research Chair in Social Policy | В3 | New |
| Prof. | Bosman | Philip | CHS | Biblical and Ancient Studies | B3 | New |
| Prof. | Dube | Themba | CSET | Research Chair Topology | B3 | Re-rating |
| Prof. | Ray | Sekhar | CSET | Physics | B3 | Re-rating |
| Prof. | Rwelamila | Pantaleo | SBL | Project Management | B3 | Re-rating |
| Prof. | Bosch | Sonja | CHS | African Languages | C1 | Re-rating |
| Prof. | Swanepoel | Petrus | CHS | Afrikaans and Theory of Literature | C1 | New |
| Prof. | Angelopulo | George | CHS | Communication Science | C2 | New |
| Prof. | Botha | Pieter | CHS | New Testament and Early Christian Studies | C2 | New |
| Prof. | Brown | Leslie | CAES | Environmental Sciences | C2 | New |
| Prof. | Eloff | Mariki | CSET | School of Computing | C2 | New |
| Prof. | Horn | André | CAES | Geography | C2 | Re-rating |
| Prof. | Jordaan | Kerstin | CEMS | Decision Sciences | C2 | Transferred with rating |
| Prof. | Makina | Danial | CEMS | Finance, Risk Management and Banking | C2 | New |
| Prof. | Mulaudzi | Phalandwa | CGS | Interdisciplinary Research Institutes | | New |
| Prof. | Oguttu | Annet | CLAW | Mercantile Law | C2 | Re-rating |
| Prof. | Pillay | Venitha | CEDU | Educational Leadership and Management | C2 | Transferred with rating |



NEW A RATINGS BOOST UNISA ACADEMICS

In 2017, two Unisa-affiliated researchers achieved A ratings from the National Research Foundation, confirming their global status and the value of their research.

Four consecutive A ratings for **Professor David Glasser**

They say it is tough at the top and that once there, staying at the peak can be more challenging than the ascent. Professor David Glasser has succeeded in attaining four consecutive A1 ratings.

"I don't do the work for the sake of an A1 rating; that's a nice-to-have. I do the work because I love it," says Glasser, a retired professor of chemical engineering who has lived in Australia since 2015 and continues to contribute to Unisa through his position as a professor extraordinarius.



| Title | Surname | Name | College | School/Department | Rating | Status |
|-------|----------------------|--------------|---------|---|--------|-------------------------|
| Prof. | Sewdass | Nisha | CEMS | Business Management | C2 | New |
| Prof. | Smit | Brigitte | CEDU | Educational Studies | C2 | Re-rating |
| Prof. | Swart | Lu-Anne | CGS | Institute of Social and Health Sciences | C2 | New |
| Prof. | Udjo | Eric | CEMS | Demographic Research | C2 | New |
| Prof. | Veeredhi | Rao | CSET | Engineering | C2 | New |
| Prof. | Clasquin- Johnson | Michel | CHS | Religious Studies and Arabic | C3 | New |
| Prof. | Dames | Gordon | CHS | Discipline of Practical Theology | C3 | New |
| Dr | Debusho | Legesse | CSET | Statistics | C3 | New |
| Dr | Djoyou Kamga | Serges | CGS | Thabo Mbeki African Leadership Institute | C3 | New |
| Prof. | Du Plessis | Charmaine | CHS | Communication Science | C3 | New |
| Prof. | Ferreira | Johannah | CEDU | Teacher Education | C3 | New |
| Prof. | Govender | Doraval | CLAW | Criminology and Security Science | C3 | New |
| Prof. | Jafari | Hoosein | CSET | Mathematical Sciences | C3 | New |
| Prof. | Lombardi | Enrico | CGS | Interdisplinary Research | C3 | Re-rating |
| Prof. | Manson | Andrew | PRC | Corporate Communications and Marketing | C3 | Transferred with rating |
| Prof. | Maritz | Jeanette | CHS | Health Sciences | C3 | New |
| Prof. | Mavhandu- Mudzusi | Azwihangwisi | CHS | Health Sciences | C3 | New |
| Prof. | Naidoo | Inderasan | CSET | Mathematical Sciences | C3 | Re-rating |
| Prof. | Nchindila | Bernard | CHS | English Studies | C3 | New |
| Prof. | Nel | Juan | CHS | Psychology | C3 | New |
| Prof. | Ngole-Jeme | Veronica | CAES | Environmental Sciences | C3 | Re-rating |
| Prof. | Padayachee | Keshnee | CGS | Institute for Science and Technology Education | C3 | New |

Table 6. Academics who were nearly nated as unted, an unbe is including with a unting in



"With modern electronic communication, you don't need to be sitting in the same room," says Glasser, who is internationally known for his work on chemical process optimisation, catalysis and synthesis, among others.

Prof. Glasser, a former Dean of the Faculty of Engineering at Wits University, where he worked for 48 years, joined Unisa in 2013 and, together with Professor Diane Hildebrandt, also previously from Wits, established the Materials and Process Synthesis (MaPs) unit. The unit has been doing trailblazing research in waste-to-energy conversion, the optimisation of chemical reactors and the development of a new method to make chemical plants more efficient by reducing their carbon dioxide emissions.

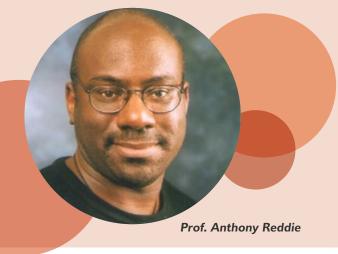
| Title | Surname | Name | College | School/Department | Rating | Status |
|-------|------------|-----------|----------|--|--------|------------|
| Prof. | Stoffberg | Gerhard | CAES | Environmental Sciences | C3 | New |
| Prof. | Vambe | Maurice | CHS | English Studies | C3 | New |
| Dr | De Wet | Chris | CHS | New Testament and Early Christian Studies | Y1 | New |
| Prof. | Stoop | Philip | CLAW | Mercantile Law | Y1 | New |
| Prof. | Viljoen | Sue-Mari | CLAW | Public, Constitutional and International Law | Y1 | New |
| Dr | Archer | Elizabeth | Research | Institutional Research | Y2 | New |
| Dr | Lephakga | Tshepio | CHS | Philosophy, Practical and Systematic Theology | Y2 | New rating |
| Prof. | Moloi | Sabata | CSET | Physics | Y2 | New |
| Prof. | Mtshiselwa | Ndikho | CHS | Old Testament and Ancient Near Eastern Studies | Y2 | New |
| Prof. | Van Staden | Wynand | CSET | School of Computing | Y2 | New |
| Dr | Lu | Xiaojun | CSET | Material and Process Synthesis (MaPS) Research Unit | Y2 | New rating |

Table 6: Academics who were newly rated, re-rated, or who joined Unisa with a rating in 2017 continued

A rating shows that black theology matters

Professor Anthony Reddie says his A2 rating from the NRF in South Africa is all the more meaningful to him considering that his discipline, black theology, lacks mainstream status in some academic circles.

Unisa, by contrast, has consistently helped to nurture black theology, also known as black liberation theology. "This rating is recognition that the work I have done matters. That is why I write," says Reddie, an independent scholar based in Birmingham in the United Kingdom.



Prof. Reddie has been an extraordinary professor with Unisa since April 2015 and is located in the Department of Philosophy, Practical and Systematic Theology in the College of Human Sciences, where he is also a research fellow.

Under the auspices of Unisa, Reddie applied for his first NRF rating in 2017 and earned a coveted A2 rating on the strength of his international standing and experience. He has published and presented lectures all over the world, including in Australia, the Caribbean, Europe, Ghana, Latin America, South Africa and the United States.

RESEARCH PROGRAMMES AND GRANTS

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RESEARCH PROGRAMMES AND GRANTS

MASTER'S AND DOCTORAL SUPPORT PROGRAMME (MDSP)

Unisa crafted the Master's and Doctoral Support Programme (MDSP) in response to the shortage of fulltime equivalent (FTE) researchers, which is made obvious through the annual science indicator published by the Department of Science and Technology.

The overall aim of the programme is to effect equity and redress by providing targeted support to members of staff in general, and in particular to black, female and disabled researchers pursuing master's and doctoral qualifications.

An important aspect of the programme is the improvement of staff qualifications at the highest levels, thereby responding directly to the Unisa strategic targets of incrementally developing research human capital development, enabling a research culture and improving research outputs. The programme is modelled on and designed to complement the National Research Foundation's (NRF's) Thuthuka Programme. It provides support to Unisa staff members who do not qualify for NRF Thuthuka support because they are (a) working on a master's degree, (b) above the age of 45 or (c) not South African citizens (note that some of these elements of the Thuthuka programme were changed in the redesigned programme implemented in 2011).

Table 2.1: MDSP grants, 2013 to 2017

Unisa is one of the few

South African universities to

invest in its researchers through

a range of innovative research

support programmes amounting toa

total value of R6 579 040.

The tables below highlight the total

number of internal grants awarded in 2017 and report on the uptake

> on each programme by researchers.

| | 2013 | 2014 | 2015 | 2016 | *2017 |
|--|------|------|------|------|-------|
| Masters and Doctoral Support Programme | 28 | 88 | 67 | 49 | 48 |
| Breakdown by race | | | | | |
| Black | 23 | 40 | 38 | 30 | 32 |
| White | 6 | 34 | 26 | 16 | 16 |
| Coloured | 0 | 3 | 1 | 1 | 0 |
| Indian | 3 | 11 | 2 | 2 | 2 |

*Value: R1 369 172

POSTDOCTORAL FELLOWSHIP SUPPORT PROGRAMME (PFSP)

Table 2.2: Participants in the PFSP, 2013 to 2017

| | 2013 | 2014 | 2015 | 2016 | *2017 |
|--|------|------|------|------|-------|
| Postdoctoral Fellowship Support Programme | 28 | 75 | 122 | 107 | 36 |
| Breakdown by race | | | | | |
| Black | 19 | 38 | 86 | 70 | 21 |
| White | 7 | 9 | 18 | 14 | 3 |
| Coloured | 1 | 7 | 4 | 4 | 0 |
| Indian | 1 | 21 | 14 | 19 | 12 |

*Programme value: R10 800 000

Postdoctoral research is usually undertaken by individuals who have recently completed their doctoral studies.

The reasoning behind this is that it gives these individuals an exclusive opportunity to improve their understanding of a specialist subject and, in the process, imbue them with unique and sought-after skills.

The advancement of these fellows is seen as essential not only in terms of their own individual training but in terms of elevating the status of the university as a whole through the fellows' research outputs. The programme recruits doctoral graduates holding doctoral qualifications that are not from Unisa and that are not older than five years. The programme annually advertises available postdoctoral positions.

EMERGING RESEARCHER SUPPORT PROGRAMME (ERSP)

In South Africa, highly productive researchers are an ageing cohort.

The National Survey of Research and Experimental Development cite that the levels of fulltime equivalent (FTE) researchers in South Africa are dwindling at 1.8% per 1 000 total in the National System of Innovation. To some extent this picture is also reflected by Unisa's profile of academic staff members holding doctoral qualifications.

The Emerging Researcher Support Programme is Unisa's response to the challenges posed by a shortage of FTE researchers and a stagnating total research output. The

goal of this competitive programme is to help permanent research staff who have completed their doctoral degrees in the last five years to develop as researchers, and to increase their measurable research output in order to

Table 2.3: Participants in the ERSP, 2013 to 2017

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|----------------------------------|--------|------|------|------|--------------------|
| Emerging Researcher Programme | 3 | 5 | 5 | 1 | No new |
| Breakdown by race | grants | | | | |
| Black | 3 | 1 | 4 | 1 | awarded in 2017 |
| White | 0 | 4 | 1 | 0 | |

eventually obtain a National Research Foundation rating. The support programme does so by providing funding for research expenses, relief lecturers and bursaries for postgraduate students.



VISIONKEEPERS PROGRAMME (VKP)

Goal 1 of the Unisa Research Strategy is to increase innovative research and research capacity.

The VisionKeepers Programme (VKP) is a research excellence capacity development initiative, managed by the Research Department to strengthen research and scholarship at Unisa. As the university currently faces the major challenge of attracting, developing and retaining young researchers, the goal of the VKP is to support the development of highly competent and confident young researchers who have solid research plans.

Table 2.4: Participation in the VKP, 2012 to 2017

| | 2013 | 2014 | 2015 | 2016 | *2017 |
|-------------------------|------|------|------|------|-------|
| Visionkeepers Programme | 11 | 11 | 7 | 7 | 4 |
| Breakdown by race | | | | | |
| Black | 8 | 5 | 6 | 1 | 3 |
| White | 3 | 2 | 1 | 0 | 1 |

*Value: R1 800 000

The main objectives of the VKP are to:

- address the problem of the aging research-productive cohort
- accelerate the development of the next generation of researchers
- support transformation of the research cohort
- improve the number of publications in high impact factor journals, thus enhancing the quality of research published by Unisa researchers
- increase the number of NRF rated researchers at Unisa.
- The programme supports young researchers by providing funding for either or both:
- pursuing research work with a view to producing high quality research publications
- hosting a research mentor from another institution

ACADEMIC QUALIFICATION IMPROVEMENT PROGRAMME (AQIP)

The goal of the Academic Qualification Improvement Programme is to enable Unisa's permanent academic staff to pursue senior qualifications (master's and doctoral degrees) on a fulltime basis.

This competitive programme complements one of the goals of both the Department of Higher Education and Training and Unisa, namely to develop staff towards the attainment of doctoral qualifications. The biggest challenge facing higher education institutions, including Unisa, is the inability to fund academic staff members' study leave. AQIP is a response to this challenge.

Table 2.5: Participation in AQIP, 2013 to 2017

| | 2013 | 2014 | 2015 | 2016 | *2017 |
|--|------|------|------|--|--------------------|
| Academic Qualification Improvement Programme (AQIP) | 46 | 62 | 45 | Due to budget having | No new |
| Breakdown by race | | | | been fully allocated, the programme | grants |
| Black | 31 | 38 | 30 | was provisionally put on hold for new applications until funds | awarded in 2017 |
| White | 13 | 19 | 14 | | |
| Coloured | 0 | 1 | 0 | become available | |
| Indian | 3 | 4 | 1 | | |

Current cycle value: R1 800 000



VISITING RESEARCHER PROGRAMME (VRP)

The Visiting Researcher Programme is a research excellence initiative, managed by the Research Department to strengthen research and scholarship at Unisa.

The goal of this programme is to raise the research profile of Unisa while increasing the already existing research capacity in colleges. The programme supports research excellence by providing funding for hosting a visiting researcher from an institution outside of Unisa for an extended period of up to two years.

Table 2.6: Participation in the VRP, 2013 to 2017

| | 2013 | 2014 | 2015 | 2016 | *2017 | |
|----------------------------------|------|------|------|------|-------|--|
| Visiting Researcher Programme | 22 | 35 | 31 | 19 | 14 | |
| Breakdown by race | | | | | | |
| Black | 9 | 11 | 2 | 2 | 9 | |
| White | 10 | 16 | 20 | 9 | 5 | |
| Coloured | 0 | 2 | 0 | 0 | 1 | |
| Indian | 3 | 6 | 9 | 7 | 2 | |

*Value: R6 579 040

The goal of this programme is to raise the research profile of Unisa while increasing the already existing research capacity in colleges.



RESEARCH PROFESSORS PROGRAMME (RPP)

Unisa introduced the academic rank of Research Professor to serve as mechanism for, among other things, increasing dedicated research and innovation participation, increasing specialised expertise and improving research outputs.

Research Professors are appointed in three-year cycles. The table below indicates participation in the Research Professors Programme (RPP) from 2013 to 2017.

Table 2.7: Participation in the RPP, 2013 to 2017

| | 2013 | 2014 | 2015 | 2016 | *2017 | |
|-------------------------------|------|------|------|------|-------|--|
| Research Professors Programme | 21 | 3 | 2 | 19 | 4 | |
| Breakdown by race | | | | | | |
| Black | 2 | 0 | 1 | 2 | 2 | |
| White | 19 | 3 | 1 | 17 | 2 | |

*Awarded for a three-year cycle.

Value: R400 000

INNOVATION SUPPORT PROGRAMME (ISP) FOR STAFF

The aim of the Innovation Support Programme for Staff is to stimulate innovative research through seed funding.

The programme provides funding to researchers to develop research projects that offer innovative solutions to the challenges that society faces and in so doing strengthen their ability to apply innovative problemsolving techniques to research problems and to increase the number of high-quality innovative research projects.

Table 2.8: Participation in the ISP, 2013 to 2017

| | 2013 | 2014 | 2015 | 2016 | *2017 |
|---|------|------|------|------|-------|
| Innovation Support Programme for Staff | 5 | 5 | 10 | 4 | 5 |
| Breakdown by race | | | | | |
| Black | 5 | 5 | 2 | 1 | 2 |
| White | 0 | 5 | 2 | 3 | 2 |
| Indian | 0 | 0 | 0 | 0 | 1 |

*Value: R500 000

Unisa's aim is to attract, develop and retain young researchers that have the capacity to conceive and execute innovative research projects.

INNOVATION CHALLENGE FOR STUDENTS

The Innovation Challenge for Students develops and nurtures innovative student research projects.

Unisa's aim is to attract, develop and retain young researchers that have the capacity to conceive and execute innovative research projects. The initiative is targeted at registered Unisa students who have the capacity to conceive innovative solutions to the challenges that society faces. The programme provides seed funding for registered students for proof of concept of novel or innovative solutions to research problems.

Table 2.9: Participation in the Innovation Challenge for Students Programme, 2013 to 2017

| | 2013 | 2014 | 2015 | 2016 | *2017 | | |
|-----------------------------------|------|------|------|------|-------|--|--|
| Innovation Challenge for Students | 2 | 4 | 2 | 3 | 3 | | |
| Breakdown by race | | | | | | | |
| Black | 2 | 4 | 1 | 3 | 3 | | |
| White | 0 | 0 | 1 | 0 | 0 | | |

*Value: R120 000.00



STUDENTS RISE TO THE INNOVATION CHALLENGE (CONTINUED)

Three brilliant, socially relevant ideas conceived by Unisa students are a step closer towards becoming reality after the innovators concerned won the 2017 Innovation Challenge and received grant funding from Unisa to develop their concepts.

The silver lining in rural water supply

The precious metal silver is one of the key elements of the water purification solution that Ms Fulufhelo Mudau has devised. She is combining it with nanotechnology to help remove pathogens – disease-causing bacteria – from river water that would otherwise be a health hazard to drink. A PhD student with the Nanotechnology and Water Sustainability Research Unit in the College of Science, Engineering and Technology, Mudau says her aim is to develop a system that households could use. It would work by running river water through a sand filter and then a nanomembrane made from crushed ion exchange granules, a polymer binder and nanoparticles of silver. She says her grant money from Unisa will be put to good use for pilot testing. "That will be the beginning of realising my plan to help bring clean drinking water to South Africans who still rely on river water."



Fulufhelo Mudau



One flush, three outcomes

Conventional flush toilets are a drain on scarce water resources and are an inefficient way to manage waste. Three students from Unisa's College of Science, Engineering and Technology have come up with an innovative new toilet system that would achieve three aims with one flush: **dispose of waste effectively, save water and produce energy for household use.**

This unusual combination of functions reflects the research strengths of the three students who have conceptualised

the vacuum toilet system, as they call it. Bringing the waste-to-energy component to the mix is Ralph Muvhiiwa, a PhD student with hands-on experience of a biodigester system that converts cow dung to biogas. The water-saving component is contributed by Cornel Phela, a BTech engineering student, while Madimetsa Manyediwane, also a BTech student, is contributing his process integration skills.

Ralph Muvhiiwa, Cornel Phela & Madimetsa Manyediwane



STUDENTS RISE TO THE INNOVATION CHALLENGE (CONTINUED)

Sweet potato solution could be an energy boost for cows

Dairy cows frequently experience exhaustion and appetite loss after giving birth. "The humble sweet potato offers an effective, affordable solution for emerging farmers who lack the means to buy commercial energy boosters," says Kerapetsi Nare, an MSc student at Unisa's College of Agriculture and Environmental Sciences.

The tonic that he extracts and distils from the

orange-fleshed sweet potato is extremely potent as an energy booster and farmers would be able to make it themselves. Nare has already made and tested his energy booster in the laboratory. His next step is to test it on the herd at the Agricultural Research Council in Roodeplaat, Pretoria and then demonstrate his solution to farmers.



OPEN DISTANCE LEARNING (ODL) RESEARCH SUPPORT PROGRAMME (RSP)

The ODL-RSP provides support to ODL researchers towards the development and improvement of their research capacity and skills to increase skills transfer, research quality and capacity building and to encourage professional development in ODL research at Unisa.

Ultimately, the programme aims to support permanent employees to produce accredited ODL research outputs and to mentor, support and develop junior researchers in the ODL-RSP group. An increase in the number of permanent employees producing quality ODL research publications not only contributes to the achievement of Unisa's Research and Innovation strategy targets, but also supports researchers in becoming recognised and proven ODL researchers.

Table 2:10: Participation in the ODL-RSP, 2013 to 2017

| | 2013 | 2014 | 2015 | 2016 | *2017 | | |
|---|----------------------|------|------|------|-------|--|--|
| Open Distance Learning Research Support Programme | Initiated in 2014 | 3 | 2 | 1 | 1 | | |
| Breakdown by race | | | | | | | |
| Black | 0 | 2 | 0 | 1 | 1 | | |
| White | 0 | 1 | 2 | 0 | 0 | | |
| **// D450.000 | | | | | | | |

*Value: R450 000



WOMEN IN RESEARCH (WIR) PROGRAMME

The purpose of the Women in Research (WiR) programme is to support women researchers who wish to undertake high quality collaborative research projects.

The programme provides research support funds to WiR groups and not to individual projects. This programme directly supports the transformation agenda of the university.

Table 2.11: Participation in the WiR programme, 2013 to 2017

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|----------------------------|------|------|------|------|------|
| Women in Research (WiR) | | 4 | 3 | 2 | 10 |
| Breakdown by race | | | | | |
| Black | 1 | 0 | 1 | 4 | 7 |
| White | 2 | 3 | 1 | 12 | 1 |
| Coloured | 0 | 0 | 0 | 0 | 1 |
| Indian | 0 | 0 | 0 | 0 | 1 |

Value: R4 200 000

Youngest PhD graduate dedicates her thesis to 'every little girl with a dream'

Dr Shandré Jansen van Rensburg was brought up to believe that being a woman is a strength and not a weakness. The power of that belief propelled her to complete a PhD by age 28 – two years ahead of her own target.

"I dedicated my thesis to my niece and every little girl who has a dream because I believe women are the backbone of every society and should be recognised and treated as such," says Jansen van Rensburg, a lecturer in Unisa's Department of Criminology and Security Science. In 2017 she received the Elsevier Women in Research award as the youngest female doctoral graduate at Unisa and a Women in Research grant to further her research. Having achieved one of her own dreams, to finish her PhD before turning 30, she is working towards realising the next one. "My dream is to be able to head research on a full-time basis. I enjoy using research to identify,



Dr Jansen van Rensburg

clarify and solve problems in society."

Her PhD thesis is entitled The human element in information security: An analysis of social engineering attacks in the greater Tshwane area of Gauteng, South Africa. Social engineering is the use of manipulative and deceptive techniques to access sensitive and confidential information as a means to achieve some sort of illicit action or omission of action.

This study sought to provide an exploration, description, explanation and analysis of social engineering attacks in order to formulate a protective strategy.

Jansen van Rensburg is now working on three main research projects. "The first is an extension of my PhD looking into information security awareness in the workplace. I am also working on more social issues such as xenophobia and the holistic well-being of women working in safety and security industries. The latter project is funded by the WiR grant."



Water researcher draws on deep well of knowledge

Still waters run deep and that seems true of Professor Shivani Bhardwaj, who might be quiet on the surface, but has a rich and dynamic research career spanning 20 years and two continents.

Since starting her chemistry PhD on waste water treatment at Jamia Millia Islamia University in New Delhi in India in 1998, she has published more than 75 articles in accredited international journals, written over 30 book chapters and made at least 70 presentations at national and international conferences.

A C3-rated researcher and full professor at Unisa since 2015, Bhardwaj is a Fellow of the Royal Society of Chemistry and of the International Congress of Environmental Research. To date, she has received well over R2,5 million in research funding from organisations such as the National Research Foundation, Eskom, University of Johannesburg and, most recently, Unisa's Women in Research programme. An outstanding feature of her research is that she has stayed essentially true to her core research interest – industrial waste water treatment – without ever stagnating. On the contrary, she has steadily enhanced her skills set, most recently adding nanotechnology and nanoscience to her knowledge base.

Bhardwaj, who is part of Unisa's Nanotechnology and Water Sustainability (NanoWaS) research unit, is using her Women in Research grant to develop more efficient and advanced materials for the treatment of industrial waste.

"Programmes such as WiR are essential," she believes. "These programmes are beneficial to all women scientists. I have mentored a few other junior staff and, as a co-investigator, I am pleased that they all successfully secured grants for their respective projects. This success has given them the confidence to push their research profiles and to reach for the next level of their careers."



Prof Shivani Bhardwaj

Researcher's lived experience has valuable lessons for today's teachers



Prof Margaret Maja

Her own experience of the difficulties associated with teaching English First Additional Language (EFAL) when neither the teacher nor the learners have English as their mother tongue is proving invaluable. So says Dr Margaret Maja, senior lecturer with the College of Education and recipient of a Unisa Women in Research grant.

"For 29 years, I taught English as first additional language to Intermediate Phase learners (grades 4 to 6) in rural areas and townships, and I realised there were some gaps – both for me as a teacher and for the learners," she says. "Teaching or learning in a language that does not belong to you comes with many challenges. I was able to overcome the challenges I encountered as a teacher and now, as a lecturer and researcher, I want to share my strategies with teachers." This is the purpose of her WiR-funded research project, which centres on strategies that EFAL teachers can use to encourage classroom interaction. "We are taking a learner-centred approach, implementing strategies so that learners can talk, read and write and engage in English both inside and outside the classroom," says Maja, who joined Unisa in 2015 and completed her doctorate the following year.

She and five team members are sharing their strategies with teachers at 14 Mogodumo Circuit schools in Limpopo Province. Since receiving the three-year WiR grant in 2017, they have engaged education department circuit managers, trained 45 teachers and conducted post-training observation, monitoring and support interviews. The results of this are already becoming evident, as Maja explains: "One teacher strategy is to develop classroom libraries. When we first started, these did not exist. When we went back recently, there were libraries in the corners of classrooms, flashcards on the walls, and learners were in groups where they can share ideas in their learning and not sitting like passengers in a bus. We are making progress."

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EXTERNAL GRANTS

In its 2016 – 2020 Research and Innovation Strategy; the Research, Postgraduate Studies, Innovation and Commercialisation Portfolio has prioritised the mobilisation of external research grants as one of its performance measures.

External grants strengthen the research portfolio and increase the number of masters and doctoral degrees amongst staff and students. In addition, these grants support productivity with regards to research projects at Unisa. External grants also encourage networking and collaborations for research.

Grants received for 2017 amounted to R61 848 792 and the breakdown of those funds is provided in the table on the right. Table 2.12: External research grants 2017

| GRANTS | | UNISA |
|---|--------|----------------|
| | Number | Amount Awarded |
| National Research Foundation grants | 259 | R 43 256 712 |
| Competitive Programme for Rated Researchers | 14 | 2 913 035 |
| Competitive Support for Unrated Researchers | 6 | 1 271 516 |
| Development Grant for Knowledge Field Development Funding (KFD) | 1 | 200 000 |
| ESRC/NRF Higher Education In Africa | 1 | 1 006 235 |
| Human Capital Development for Multi-Wavelength Astronomy | 1 | 65 000 |
| Indigenous Knowledge Systems | 1 | 48 015 |
| IRG - China / South Africa Research Cooperation Programme | 1 | 10 273 |
| IRG - France / South Africa Research Cooperation Programme | 1 | 100 000 |
| IRG - Namibia / South Africa Research Cooperation Programme | 1 | 156 786 |
| IRG - NRF/International Centre for Theoretical Physics Joint Collaboration for Science Advancement | 1 | 188 410 |
| IRG - Taiwan / South African Research Cooperation Programme | 1 | 214 699 |
| IRG - UK / South Africa Researcher Links Grants for Travel | 1 | 20 800 |
| Knowledge Interchange and Collaboration | 15 | 335 000 |
| Nanotechnology Flagship Programme | 1 | 145 696 |
| Research Development Grants for Y-Rated Researchers | 7 | 1 299 271 |
| S&F - Collaborative Postgraduate Training | 3 | 1 085 000 |
| S&F - Desmond Tutu Training Grants | 1 | 120 000 |
| S&F - DST / NRF Innovation Postdoctoral Fellowships | 3 | 611 907 |
| S&F - Extended support for scholarships and fellowships | 4 | 440 000 |
| S&F - Extension for NRF Support for Doctoral Studyw | 1 | 110 000 |
| S&F - Innovation Doctoral Scholarships | 31 | 3 598 768 |
| S&F - Innovation Honours Grants | 2 | 1 320 000 |

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| National Research Foundation (continued) | Number | Amount Awarded |
|---|--------|----------------|
| S&F - Innovation Masters Scholarships | 35 | 2 564 038 |
| S&F - Innovation Scholarships for Non-South African citizen | 1 | 330 129 |
| S&F - NRF Free-standing Postdoctoral Fellowships | 2 | 3 010 |
| S&F - NRF/DAAD Scholarships | 3 | 260 000 |
| S&F - NRF-TWAS African Renaissance PhD Fellowship Programme | 1 | 120 000 |
| S&F - Part time Doctoral Scholarships | 3 | 140 000 |
| S&F - Research Career Awards | 1 | 450 000 |
| S&F - Research Development Grants for nGAP Scholars | 2 | 80 000 |
| S&F – SANHARP | 1 | 750 000 |
| S&F - Sasol Inzalo Foundation | 1 | 120 000 |
| S&F - Scarce Skills Development Fund | 2 | 4 902 000 |
| S&F - Scarce Skills Doctoral Scholarships | 23 | 2 473 891 |
| S&F - Scarce Skills Masters Scholarships | 16 | 1 625 000 |
| S&F - Scarce Skills Postdoctoral Fellowships | 3 | 623 736 |
| S&F - Scholarships | 3 | 900 000 |
| S&F - Scholarships & Fellowships Programme | 5 | 845 000 |
| SA Research Chairs - Open | 4 | 9 351 195 |
| Sabbatical Grants to Complete Doctoral Degrees | 1 | 193 000 |
| Special Transformation Awards | 2 | 500 000 |
| Thuthuka | 26 | 1 765 503 |
| NRF Rating Incentive | 202 | R 7 580 000 |
| Incentive Funding for Rated Researchers | 202 | R 7 580 000 |
| TOTAL | 470 | R 51 106 712 |



| OTHER EXTERNAL GRANTS | Number | College | Amount Received 2017 |
|---|--------|---------|----------------------|
| Department fund: ABEERU | 1 | CAES | 432 580 |
| Department fund: CAES BMW Project | 1 | CAES | 72 343 |
| Department fund: Pig Nutrition & Pollution | 1 | CAES | 10 961 |
| Department fund: Alfred P Sloan Foundation | 1 | CAES | 454 |
| Department fund: DESTEA Market Access Research Project | 1 | CAES | 924 402 |
| Department fund: Water Research Commission: K5/2568/3 | 1 | CAES | 199 261 |
| | | | |
| BMI Risk Analytics Research Grant | 1 | CAS | 73 350 |
| Dept, Fund: Accounting | 1 | CAS | 105 631 |
| Dept, Fund: FNB Learning Project | 1 | CAS | |
| | | | |
| Department fund: Lowenstein Trust - Making Schools Better | 1 | CEDU | 10 460 |
| Department fund: Catholic Commission for Justice & Peace | 1 | CEDU | 85 255 |
| Department fund: Matthew Goniwe School of Leadership & Governance | 1 | CEDU | 5 933 168 |
| | | | |
| The Innovation Hub Management Company | 1 | CEMS | 27 400 |
| Department fund: Business Management Chairs | 1 | CEMS | 762 663 |
| Department fund: Banking Research | 1 | CEMS | 5 504 |
| Department fund: ABSA Banking Chair | 1 | CEMS | 189 815 |
| | | | |

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| OTHER EXTERNAL GRANTS (Continued) | Number | College | Amount Received 2017 |
|---|--------|---------|-------------------------|
| Department fund: CARS | 1 | CGS | 15 200 |
| Department fund: External Actions of the European Union | 1 | CGS | 2 789 910 |
| Department fund: External Actions of the European Union - DHET | 1 | CGS | 421 504 |
| Department fund: OWSD Postgraduate Fellowship | 1 | CGS | 150 266 |
| Mining Health and Safety Council of South Africa | 1 | CHS | 26 000 |
| Mellon Foundation | 1 | CHS | 9 966 |
| SAMRC - Forte Collaborative Research Programme (CHS) | 1 | CHS | 400 000 |
| Department fund: Department of Classics | 1 | CHS | 1 606 |
| Department fund: Media Policy and Democracy Project | 9 | CHS | 6 618 |
| Department fund: WIPHOLD-BRIGALIA BAM CHAIR IN ELECTORAL DEMOCRACY IN AFRICA | 1 | CHS | 150 000 |
| Department fund: MSG - Myth Study Group (NIHHs Summer School) | 1 | CHS | 101 547 |
| Department fund: NIHSS - KM Masemola | 1 | CHS | 24 370 |
| Department fund: NIHSS - P Mungwini | 1 | CHS | 7 352 598 |
| Department fund: NIHSS - T Vokwana | 1 | CHS | 303 859 |
| Department fund: NIHSS - M Z Phiri | 1 | CHS | 132 000 |
| Department fund: DAAD SeLA project | 1 | CHS | 3 295 |
| | | | |
| Department fund: Noah RI | 1 | CLAW | 211 932 |
| Department fund: NIPMO Chair on IP | 1 | CLAW | 3 053 |

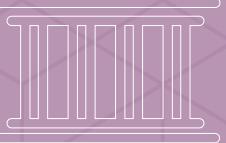


| OTHER EXTERNAL GRANTS (Continued) | Number | College | Amount Received 2017 |
|---|--------|---------|-------------------------|
| Department fund: Chemistry - SASOL Grant | 1 | CSET | 34 496 |
| Department fund: Water Research Commission | 1 | CSET | 37 336 |
| Department fund: WRC - Chemistry Research | 1 | CSET | 450 719 |
| Department fund: Conference Account for Dept of Mathematics | 1 | CSET | 23 300 |
| Department fund: ESKOM Grant | 1 | CSET | 51 437 |
| Department fund: ESKOM Grant - Prof G Qi | 1 | CSET | 3 780 |
| Department fund: WRC NOM – NanoWS | 1 | CSET | 208 999 |
| Department fund: Eskom - Fly Ash Project | 1 | CSET | 57 142 |
| Department fund: Nano Africa Conference | 1 | CSET | 41 000 |
| Department fund: WRC - Ajay Mishra | 1 | CSET | 530 212 |
| Department fund: NanoWS Lab income - Research facility | 1 | CSET | 28 541 |
| | | | |
| Department fund: NIPMO Capacity Development Grant | 1 | PARC | 1 780 889 |
| Department fund: TIA Seed Fund | 1 | PARC | 1 424 354 |
| Department fund: SARIMA ITTE Programme | 1 | PARC | 1 377 |
| Department fund: Framework 7- Project European Union | 1 | PARC | 11 523 |
| TOTAL - OTHER EXTERNAL GRANTS | 73 | | R 18 622 080 |

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RESEARCH CHAIRS AND INSTITUTES



Research & Innovation @ Unisa 2017 30

RESEARCH CHAIRS AND INSTITUTES

RESEARCH INSTITUTES AND OTHER RESEARCH ENTITIES

Unisa takes great pride in its institutes, bureaux and other research entities dedicated to a wide variety of research areas. These units are just as active as the various chairs, and involve academics, students and the community.

Archie Mafeje Research Institute (AMRI)

Research chairs and

units play an important

role to stimulate

research and promote

research excellence.

The Archie Mafeje Institute for Applied Social Policy Research (AMRI) is a policy research institute dedicated to promoting the legacy of the late Professor Archie Mafeje, in pursuit of progressive change in African society.

Dr Busani Mpofu is the acting head of AMRI, which provides a platform for African scholars and analysts to become thought leaders for social transformation and Pan-African agendas on the continent. The institute strives to apply fresh thinking and develop novel policy ideas on power, knowledge and identity; decoloniality; land reform, agrarian questions and agricultural development; African social formations; African families and social policy; governance and social justice (nation building and social cohesion), development, inequality and poverty and state; and conflict, violence and ideology. The aim is to address poverty, inequality, social disintegration, social injustice, the collapse of community and family



Dr Busani Mpofu

institutions, and other societal ills through research that promotes decolonising, indigenising, diversifying, and depatriarchalising knowledge and the curriculum.

In 2017 AMRI produced five articles in peer-reviewed journals, four books, four book chapters and supervised four doctoral and two Dr Busani Mpofu master's students. Five articles written by researchers from the institute appeared in a special issue of the African Insight journal.

RESEARCH CHAIRS AND INSTITUTES



Bureau of Market Research (BMR)

The bureau is a research unit within the College of Economic and Management Sciences, and undertakes basic socio-economic market research, including syndicated research, and commissioned research.

In one of its highlights of 2017, the BMR updated the macroeconomic, formal retail trade personal income and expenditure and population estimates (at ward level) for South Africa. These studies provide business intelligence for spatial planning, infrastructure and basic service development and investment. Apart from enabling a better understanding of the South African formal business sector, BMR research has investigated the state of consumer well-being and happiness or satisfaction. As part of the 2017 research agenda,



the BMR used applied neuroscience and biometric research to assess consumer savings and investment decision-making. In particular, the BMR has successfully adapted internationally recognised human emotion and household wealth research techniques to develop

exploratory and constructive research methods to suit typical South African conditions.

In addition, the BMR conducted several commissioned research projects in 2017. The results are being used to inform planning for the development of major cities. Furthermore, they have contributed to the review of the City of Johannesburg 2040 vision, as well as to improved municipal service delivery and the communication efficiency of one of the major metropolitan municipalities in South Africa. The BMR also provided valuable inputs to the Minister in the Presidency responsible for tracking progress made with the National Development Plan (NDP).

Prof. Deon Tustin is the head of the BMR, which in 2017 published seven peer-reviewed articles in scientific journals and presented eight conference papers. The institute supervised 10 master's students and11 doctoral students. one doctoral degree was conferred.

Institute for African Renaissance **Studies (IARS)**

Located in the College of Graduate Studies, IARS was established to provide Afrocentric multi-, inter- and trans-disciplinary scholarly academic research and postgraduate studies through research leading to master's and doctoral degrees.

The research focuses on Africa and the Diaspora within a global context. The institute also offers executive programmes in line with the university's research policies, co-ordinates and manages knowledge-driven programmes in collaboration with external agencies

and participates in high-level local and Pan-African community scholarship and intellectual engagement.

IARS publishes in the International Journal of African Renaissance Studies: Multi-, Inter- and Trans-disciplinarity, as well as other scholarly works, and engages in knowledge-driven active social activism, community engagement and participatory research.

Unisa's Little Theatre (The African Calabash) falls under its management. During 2017, IARS published nine articles in accredited journals, four book chapters and three books.

Dr Dries Velthuizen is the acting head of IARS.



Dr Dries Velthuizen



Institute for Corporate Citizenship (ICC)

The institute conducts critical academic research that influences and provokes business enterprises to change in ways that make them even more accountable to society.

Through its research, the institute poses pertinent, often difficult questions about the role and contribution of business to sustainable development. It converts this research into tuition offerings, such as Sustainability and Greed, a signature module of the College of Economic and Management Sciences.



Prof. Mariki Eloff

The ICC has four active research programmes. These are the Exxaro Chair in Business and Climate Change, the Responsible Investment Programme, the Teaching Business Ethics Programme and the Information Security as Corporate Responsibility Programme.

The ICC's research outputs for 2017 were 11 accredited journal papers, seven peer-reviewed conference papers and one poster. Professor Mariki Eloff leads the institute in an acting capacity.

Institute for Dispute Resolution in Africa (IDRA)

Located in the College of Law, IDRA's research programme is directed towards building a body of knowledge based on humanistic values and promoting a harmony model of dispute resolution.

This model is sensitive to the cultural context of Africa and the African Diaspora, and could serve humanity as a whole. IDRA's research is predominantly community based and vested in the lived experience of communities and their key knowledge holders. Thus, it seeks to revive knowledge embedded in communities, particularly knowledge on dealing with all kinds of disputes. In contrast with the conventional style of dispute resolution, community knowledge is grounded in traditional and community values, and emphasises mutual respect, equality and an appreciation of human interconnectedness.

Some of IDRA's most successful projects since 2012 are the South African San Dispute Resolution Project, involving the San community in Platfontein in the Northern Cape, and the Electoral Dispute Resolution Project in Ephraim Mogale District Municipality in the Limpopo Province.

Dr Dries Velthuizen is the head of the institute. During 2017, six articles and one book chapter were published.



Dr Dries Velthuizen

RESEARCH CHAIRS AND INSTITUTES



Institute for Gender Studies

The institute promotes scholarship as a way of changing society in Southern Africa to make it more gender equitable.

Its underlying philosophy is that raising awareness of gender is the only way to make progress in eliminating gender-based violence, homophobia, transphobia and discrimination against women in the workplace and in civil society. Professor Deirdre Byrne heads the institute,



Prof. Deirdre Byrne

whose research is theory led and multidisciplinary, interdisciplinary and transdisciplinary. It coordinates research projects on gender and representation, gender and ODL and gender technology, and has an interdisciplinary honours programme in Gender Studies.

During 2017, the institute published four articles in peerreviewed journals.

Institute for Global Dialogue (IGD)

For over 23 years, the institute has served an independent foreign policy think tank that analyses and promotes dialogue on the international political and economic environment and the role of South Africa and Africa within it.

Initially founded in 1995 as a grant-funded foundation, it evolved into an institute and entered into a strategic agreement with Unisa in 2010 to pursue joint research, dialogue and publications. Dr Philani Mthembu is the Executive Director of the IGD, which does consultancy work for the South African government, international organisations and a number of major South African corporates that have invested in emerging markets.

The institute has four research programmes; Foreign Policy Analysis, Geopolitical Dynamic and Governance, International Diplomacy, and the Centre for Latin American and Caribbean Studies.

In 2017, IGD published two peer-reviewed journal articles and five book chapters. IDG supervised two master's students and one doctoral student.



Dr Philani Mthembu

RESEARCH CHAIRS AND INSTITUTES



Institute for Open and Distance Learning (IODL)

Housed in the College of Graduate Studies, the institute's mandate is to position Unisa as a leading open and distance learning (ODL) university in Africa and the rest of the world.

Its major role is to build ODL research capacity across the university, encourage Unisa staff to conduct ODL research, and coordinate research relevant to the strategic thematic areas set for ODL research at Unisa. These are



Prof. Mpine Makoe

online ODL, technology in ODL teaching-learning, the changing role of academics in ODL, assessment practices and student support in an ODL institution. The institute is led by Professor Mpine Makoe and was instrumental in Unisa's successful establishment of the local chapter of the Global Doctoral Consortium of the International Council for Distance Education.

In 2017, IODL published eight articles in peer-reviewed journals, one book chapter and 10 conference proceedings. One doctoral student graduated.

Institute for Science and Technology Education (ISTE)

The Institute for Science and Technology Education (ISTE) evolved from what was originally known as CIMSTE – the Centre for Mathematics, Science and Technology Education.

Unisa took over the centre in 2006 and renamed it ISTE. The institute now resides in the College of Graduate Studies and promotes inter-college collaboration on mathematics, science and technology (MTS) education. Through this collaboration, ISTE coordinates the integration, tuition and development of modules for all formal and non-formal MST education programmes at Unisa.

Each year since 2009, the institute has held a Winter School as part of its community service for the

development of mathematics, science and technology educators. Another annual event is the ISTE Conference, which has been held in the Kruger National Park since 2010. Apart from being a forum for established researchers to discuss their research, the conference has offered novice researchers substantial opportunities to enhance their capacity.

The institute has five main lines of education research: mathematics, life sciences, physics, chemistry and information and communications technology (ICT).

During 2017, the institute produced eight articles in peer-reviewed journals and one conference proceeding. Professor David Mogari is the acting head of ISTE.



Prof. David Mogari



Institute for Social and Health Studies (ISHS)

The ISHS is an Africa-centered, internationalist home to community-engaged scholars and activists who situate themselves in compassionate, transdisciplinary liberatory knowledge practices in the service of contextualised human development.

The institute builds on the collective and individual contributions of its people and their expertise in the social, psychological and public health sciences. ISHS aims to deepen the understanding of social and psychological health phenomena, and enable the transformation of psychology and cognate disciplines.



Prof. Mohamed Seedat

ISHE has six strategic goals:

- Conduct transdisciplinary, community-engaged and liberatory research in niche areas
- Offer analytically oriented services, research-based information and specialist advice to government,

corporate and civil society actors

- Provide postgraduate training and internship opportunities for next-generation scholars and change agents
- Produce knowledge resources and promote their use, reach and influence in society
- Grow partnerships and collaborations for research, training and public engagement
- Create an enabling platform for the efficient and effective operational functioning and management of the institute.

During 2017, the institute published 22 articles in peerreviewed journals, one conference proceeding, 13 book chapters and two books. One doctoral student graduated. Professor Mohamed Seedat is the head of ISHS.

Research Institute for Theology and Religion

The institute was founded in 1975 to develop, manage and disseminate religious and theological research. Its South African Science and Religion Forum has convened annually since 1993 and is the only significant initiative of its kind in the country. The institute's other interface with society, the Forum for Religious Dialogue, regularly presents research seminars. Professor Cornel du Toit is the head of the institute, which supervises master's and doctoral students, participates in international interdisciplinary research projects and has a strong commitment to community engagement.

For 2017, the institute produced 27 articles in peer-reviewed journals.



Prof. Cornel du Toit

RESEARCH CHAIRS AND INSTITUTES



Thabo Mbeki African Leadership Institute (TMALI)

As a partnership between Unisa and the Thabo Mbeki Foundation, TMALI is a vehicle for preparing the next generation of leaders for Africa's renewal – politically, socially, economically and culturally.

Since its launch in 2010, the institute has provided training to over 1 500 students, mainly through short learning programmes designed to produce change agents ready



Prof. Vusi Gumede

and able to address African issues. An example is the Course in African Political Economy, which is intended to familiarise participants with the elements of economic theory applicable to African economic challenges and discuss alternative approaches to the study of economics, globalisation and development in the context of Africa.

Former President Thabo Mbeki, Unisa's Chancellor, is the patron of TMALI, whose head is Professor Vusi Gumede.

In 2017, the Institute published nine articles in accredited journals, eight book chapters and two books. Three doctoral students and two master's students graduated.

ENDOWED RESEARCH CHAIRS

Unisa is proudly African and its research and innovation agenda is informed by the needs and aspirations of the African content, yet also explores brave new frontiers in a number of key disciplines.

This societal imperative is served by a number of chairs and institutes. In addition to the chairs established through Unisa investment, the university co-hosts a number of leading endowed research chairs.



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DST/NRF SARChI Chair in Development Education

Established in 2007, the SARChI Chair in Development Education makes human development the goal of its academic research and citizenship education.

The context of development education is restorative action and cognitive justice. Through research, postgraduate teaching and community engagement, the chair explores how disciplinary knowledge production in key areas such as science, economics, education and law can be reconstituted to bring about just and humancentred development on the continent.

The chair works closely with the leadership of South African and other African universities, and with selected institutions and individuals in the North. The focus is on methodologies for transforming research paradigms and curricula, leadership building and systems.

The PASCAL International Observatory, an OECDoriginated body, has endorsed the chair as its global South Centre on Universities and Learning Regions. Its focus is on lifelong learning, resilient and adaptable communities, management of public sector reforms and the balance between economic, social, environmental and cultural development.

The International Association of Universities has recognised the chair's work as a Social Innovation. A remarkable innovation the chair has brought into the academy is that it has established a group of distinguished



Chair Incumbent Prof. Catherine Odora Hoppers

thinkers and professors from all over the world in fields such as quantum physics, law, economics, the history of science, philosophy and education, and combined it with a transdisciplinary cohort of students from bio-medical science, law, education, and economics, introducing transdisciplinarity-in-action to the university.

On top of that, the chair has convened a "circle of elders" known as the International Indigenous Knowledge Advisory Faculty, comprising indigenous knowledge custodians and practitioners. This is part of the chair's vision of bringing the core of African values, traditions and knowledges to the awareness of university staff and students.

During 2017, the chair produced two articles in accredited journals and eleven conference proceedings. One doctoral student graduated.



The chair aims to bring the core of African values, traditions and knowledges to the awareness of university staff and students.



DST/NRF SARChI Chair in ICT for Development

Information and Communication Technology (ICT) is a powerful tool for resolving developing world challenges towards improving the human condition in a sustainable way.

The SARChI Chair in ICT for Development (ICT4D) seeks to use ICTs to address developmental constraints, whether financial, infrastructural (such as a lack of internet access) or skills related (as in a lack of ICT and computational skills).

Located within the School of Computer Science, the chair has an initial lifespan of five years, from January 2016 to December 2020. Its focus is on activating, managing and monitoring research projects involving postgraduate students, who have access to the School of Computing's well-equipped Human-Computer Interaction Laboratory, as well as on developing productive and constructive collaborations.

The chair already collaborates with the Meraka Institute at the CSIR, Monash University in Australia, Glasgow University in Scotland and Koblenz-Landau University in Germany. Given the developmental focus of ICT4D, the chair intends extending its collaborations in Africa and with other developing countries, especially Brazil and India.

One of the developmental challenges the chair is addressing is the sustainable application of mobile technology for enhancing teaching and learning. The



Chair Incumbent Prof. Judy van Biljon

emphasis is on the digital skills of teachers and students, infrastructure and appropriate devices, and policies for the provision and use of mobile devices in teaching and learning. Other projects are under way to design, develop and test mobile apps for addressing issues of low bandwidth, unreliable internet access and other resource constraints. This work emphasises the user experience, which includes the accessibility and usability of devices. The Human-Computer Interaction Laboratory provides facilities to support the user experience research towards promoting knowledge sharing in the African context.

The chair published six articles in accredited journals in 2017. One master's and one doctoral student graduated.

One of the developmental challenges the chair is addressing is the sustainable application of mobile technology for enhancing teaching and learning.



DST/NRF SARChI Chair in Law, Society and Technology

The DST/NRF SARChI Chair in Law, Society and Technology is located within the College of Law and was established in January 2016 for a period of five years.

The research focus of the chair is aligned with knowledge generation and human capital development in response to the needs of the African continent (e-commerce legal frameworks for Africa). It also contributes to economic sustainability, innovation and capacity building in science

DST/NRF SARChI Chair in Social Policy

Located in the College of Graduate Studies, the DST/NRF SARChI Chair in Social Policy was established in 2013 to breathe new life into contemporary thinking on social policy.

Whereas the dominant social policy discourse revolves around the welfare regime paradigm or the social protection paradigm, the chair's emphasis is on transformative social policy.

Transformative social policy stresses the multiple tasks of social policy (production, protection, redistribution, reproduction and social cohesion/nation-building). It explores the transformative role of social policy for the economy, social relations, social institutions and human capability and functioning, rather than a residual role.



Chair Incumbent Prof. Tana Pistorius

It also emphasises the synergistic relations between economic and social policies. This approach anchors social policy on the norms of solidarity and equality. The chair's work consists of research, postgraduate education and policy outreach or community engagement, using an integrated approach that sees research staff, research associates and postgraduate students working together on specific projects.

The research programme is organised under the theme, "Rethinking social policy: in search of inclusive development", which includes research on rethinking social policy, poverty and non-formal social provisioning.

The chair has strategic relationships with international organisations such as the United Nations Research Institute for Social Development (Geneva, Switzerland), the United Nations Institute for Economic Development and Planning (Dakar, Senegal), the Council for the

and technology (the role of intellectual property [IP] in the knowledge economy) and open distance learning (the management of IP for open learning). The chair promotes responsible virtual citizenship (legal aspects of cybersecurity, IP and cybercrime) and focuses on intellectual property law and innovation, especially the role that design law can play in the innovation chain.

During 2017, the chair produced one article in a peerreviewed journal, 10 book chapters and one conference proceeding. One LLD doctoral student and two LLM master's students graduated.

Development of Social Science Research in Africa (Dakar, Senegal) and the African Institute for Agrarian Studies (Harare, Zimbabwe).

During 2017, the chair published sixteen articles in accredited journals.



Chair Incumbent Prof. Jimi Adesina

Exxaro Chair in Business and Climate Change

The Exxaro Chair in Business and Climate Change (Chair) was established in 2008 with a life span of three years.

Following the chair's success, Exxaro Resources (Ltd), through its Chairman's Fund, renewed the chair's mandate for a further five years to 2015. The chair's life has now been extended to 2018.

The vision of the chair is 'to create a centre of excellence in business and climate change research, education and advocacy oriented community engagement'. Its mission is 'to support South African and African stakeholders (including business, government and civil society) in their quest to reduce greenhouse gas emissions and adapt to climate change through relevant and cutting edge research, education and advocacy oriented community engagement programmes'.

The chair is mandated to operate in three thematic areas namely, research, academic programme development (including training and capacity building), and advocacyoriented community engagement.



Chair incumbent Prof. Godwell Nhamo

In terms of governance, the chair resides in the Institute of Corporate Citizenship (ICC) hosted by the College of Economic and Management Sciences under the auspices of the Executive Dean. While the chair's autonomy is safeguarded, he or she is guided by an Advisory Board with nominated representatives from Exxaro, the business sector, civil society, government, and representatives from Unisa. The Advisory Board meets at least twice a year and advises the chair on issues of relevance and direction with regard to the chair's mandate.

During 2017, the chair successfully applied for external funding to renew the Exxaro Chair for a further five-year period until 2022. Ten journal articles were published in 2017, eight of them in high impact and international journals. Two doctoral students graduated.

The vision of the chair is 'to create a centre of excellence in business and climate change research, education and advocacy oriented community engagement'

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UNESCO-Unisa Africa Chair in Nanosciences and Nanotechnology

Nanoscience and nanotechnology have the potential to deliver effective, affordable solutions to African developmental challenges such as the supply of safe drinking water, renewable energy generation and the eradication of diseases such as malaria.

To harness this potential, it is important for the nanotechnology efforts of Africa to be synchronised and for the continent to have a voice that is heard worldwide. This is the role that the UNESCO-Unisa Africa Chair in Nanosciences and Nanotechology has taken on. A bridge builder second to none, the chair is proving to be an effective interface between the key institutional, national and continental players in the field. Launched in 2013, the chair is a three-way partnership between Unisa, UNESCO and the iThemba Labs-National Research Foundation. It also falls within the framework of the University Twinning and Networking programme and the UNESCO Chairs programme, which promote think tanks and bridge building between the academic world, civil society, local communities, researchers and policy makers.

Human capacity development in nanosciences and nanotechnology is a major focus of the chair, which coordinates a postgraduate and postdoctoral fellowship programme for approximately 40 fellows from South Africa and the rest of Africa.

The chair reaches out to its many partners around the world to assist in co-funding the fellows. Funding partners include UNESCO, the International Organisation of Women in Science, the Academy of Science for the Developing World, the Abdul Salam International Centre for Theoretical Physics, and the United Nations Centre of Science and Technology, among others.

The UNESCO-Unisa Chair has strong links with official associations such as the African Laser Centre of the African Union, the African Materials Research Society, and the African Solar Energy Network, among others. It is also represented on African Union platforms such as the jury for the Obasanjo African Award, the Nkwame Nkrumah continental award and the African Academy of Sciences.

In 2017 the chair produced 97 articles in international peer-reviewed journals and one conference proceeding was presented. In addition, seven master's and four doctoral students graduated.



Chair incumbent Prof. Malik Maaza

Human capacity development in nanosciences and nanotechnology is a major focus of the chair.



UNESCO Co-Chair in Early Childhood Education, Care and Development

During 2017, Unisa was selected as the co-host of the UNESCO Chair in Early Childhood Education, Care and Development.

Unisa shares this chair with the University of Victoria in Canada, which hosted the chair on its own from 2008 until June 2017 when it supported Unisa's successful application to UNESCO to be the co-holder.

The co-chairholders are Professor Alan Pence from the University of Victoria and Professor Hasina Ebrahim from Unisa's College of Education. This arrangement is synergistic: Pence has a wealth of experience in working with the First Nations in Canada and has also worked extensively with leaders in Africa, complementing Unisa's focus on capacity building and knowledge production programmes.

From Unisa's perspective, the main priority for the Chair in Early Childhood Education, Care and Development is to foreground African research on early childhood, policy, practice and teacher development. The intention is to help develop a new cadre of scholars and researchers on the continent and promote research highlighting African realities and conditions impacting on child outcomes.

A major priority for the chair is to contribute to the professionalisation of the early care and education workforce. The Unisa chairholder, who was instrumental in developing the South African "birth to four" curriculum framework for teachers, is at the forefront of a European Union-funded initiative to develop degree and diploma qualifications for the early years below Grade R. No research output figures are available as the chair was only established in 2017.



Co-chair incumbent Prof. Hasina Ebrahim

UNITWIN/UNESCO Chair in Open Distance Learning (ODL)

Established towards the end of 2017, the UNITWIN/UNESCO/Unisa Chair in ODL cements the university's position as Africa's largest university and one of the mega-universities in the world.

As an African mega-university, Unisa is seen as having the potential to make a massive impact on higher education on the continent, particularly among the young generation and marginalised communities. Apart from its ability to support high-level capacity development across borders, Unisa has a vast network of active collaborative relationships with some of the foremost ODL leaders in Africa and internationally. The chair's main objective is to promote an integrated, coordinated system of research, research training and



Chair incumbent Prof. Moeketsi Letseka

production and dissemination of knowledge on ODL. In the first four years of its existence, the Chair in ODL seeks to build a sustainable pipeline of master's and PhD students who can be trained as highly qualified ODL practitioners, managers, scholars and researchers in the ODL domain.

The chairholder, Professor Moeketsi Letseka, is Editor-in-Chief of the international journal Africa Education Review and has authored or co-authored numerous books and book chapters, including a three-book series published in 2015 and 2016 by an international publishing house in New York.

No research output figures are available as the chair was only established in 2017.



WIPHOLD-Brigalia Bam Research Chair in Electoral Democracy in Africa

The WIPHOLD-Brigalia Bam Chair in Electoral Democracy in Africa was established following discussions between Unisa, the Electoral Commission of South Africa and the Women's Investment Portfolio Holdings (WIPHOLD) in 2010.

The chair carries the names of Dr Brigalia Bam, who for many years had an illustrious career leading the Electoral Commission of South Africa, and WIPHOLD, the sponsor of the chair. Subsequently, the chair was located in the Department of Political Sciences, College of Human Sciences.

The chair has played (and continues to play) a critical role in South Africa's evolving democratisation and Africa's elections. It has contributed immensely to the understanding of contemporary debates, innovations and dilemmas of democratisation through election sciences.

In 2017, the chair produced two journal articles in accredited publications, one book chapter and three conference proceedings. The highlight of the year was a research grant from the National Institute for Humanities

and Social Sciences (NIHSS) that enabled the chair to host the 4th Annual Colloquium in Electoral Democracy



Chair incumbent Prof. Kealeboga J Maphunye

Unisa research chairs

Initially, the Unisa research chair programme was intended to run until December 2015. However, such was the value derived from the four university-funded chairs that the programme has been extended for a further three years, from 2016 to 2018. The four chairs are as follows:

- Ecotoxicology
- High-Performance Scientific Computing
- Macroeconomic Policy Analysis
- Topology

For 2017, these chairs' collective output included over 50 articles in accredited journals and nine master's and doctoral graduates.



Research Chair in Ecotoxicology

Cancer is the second leading cause of death in humans, accounting for one in six deaths globally in 2017, according to the World Health Organization (WHO) website and is still one of the most difficult diseases to treat.

The disease represents a huge socioeconomic burden on nations, considering the costs associated with the diagnosis, treatment and research of cancer.

Despite the wide range of anticancer drugs that are currently available on the market, challenges regarding multi-drug resistance, poor therapeutic efficacy, adverse side-effects and poor bioavailability are still being faced, which necessitate the continued development of new anticancer agents. The focus of the Research Chair in Ecotoxicology is on the design and synthesis of biologically relevant heterocyclic compounds with potential anticancer activity.

The compounds are evaluated for potential cytotoxicity or an antiproliferative effect in vitro on breast, cervical and lung cancers, which are the leading causes of cancer deaths among females and males in South Africa. Their mechanisms of anticancer activity as potential antimitotic agents or inhibitors of protein kinases are evaluated experimentally, complemented with molecular docking (in silico) into the receptors to help us understand the anticancer activity and to guide further structure-activity relationship (SAR) studies.

The diversity of approaches, methods and tools needed to carry out this type of interdisciplinary project requires collaborative action with researchers from various disciplines. The superbly equipped chemistry laboratories and their proximity to the laboratory facility and personnel of the College of Agriculture and Environmental Sciences at the Unisa Science Campus are the ideal setting for this work. The group published 10 scientific papers, one ODL paper and a chapter in a textbook in 2017. One MSc student and one PhD student graduated.



Chair incumbent Prof. Jack Mphahlele

Research Chair in High-Performance Scientific Computing

The advent of big data has made it imperative for South Africa and Africa to build capacity in highperformance scientific computing (HPSC) and produce highly qualified professionals in the field.

The chair has been training master's and doctoral students in high-performance computing and conducts research on two main topics in the domain of computational physics. One topic is the calculation of the properties of



Chair incumbent Prof. Moritz Braun

atoms, molecules and solids, using the method of finite elements in three dimensions. The second topic is the simulation of seismic processes, making use of parallel processing to estimate the parameters that describe the structure of the substrate or the seafloor. In addition, part of the chair's focus includes research into algorithm and application optimisation, which may be used across colleges and departments in the application of HPSC techniques.

During 2017, the chair produced seven articles in accredited journals, in which Prof Braun and/or Dr K Obodo was the co-author.



Research Chair in Macroeconomic Policy Analysis

As civil war and political instability have taken their toll on the economies of some sub-Saharan African countries in post-colonial times, so have misaligned or inappropriate macroeconomic policies.

The main purpose of the Research Chair in Macroeconomic Policy Analysis is to evaluate some of the monetary and fiscal policies that have a bearing on economic growth and socio-economic issues such as poverty and unemployment, and to use the findings to provide tailor-made policy advice to individual countries.



Chair incumbent Prof. Nicholas Odhiambo

Among other things, the chair analyses inflation, interest rate and exchange control policies, as well as financial liberalisation policies.

The chair has a reputation for producing high volumes of high-quality research year after year. In 2017, the chair published 30 articles in accredited journals, which was significantly higher than the 22 of 2016. In addition, four conference papers were presented at various academic conferences and 17 working papers were produced. The latter are available in the chair's recently established Unisa Economic Research Working Paper Series. Two master's students and five doctoral students graduated in 2017.

Research Chair in Topology

In helping to deepen humanity's understanding of the world, topology can be an invaluable discipline, as it describes mathematical spaces and their properties.

Thus, topology can be a useful guide in studying areas such as biology, cosmology, computer science, robotics and theoretical physics.

In 2017, the Chair in Topology published six articles

in international ISI-listed journals. Whereas earlier publications mainly explored the traditional aspects of point-free technology, more recent publications have algebraic and categorical leanings, thus increasing the readership of the chair's publications and opening up more possibilities for international collaboration. Research areas of interest are point-free technology, category theory, algebraic frames, commutative f-rings and rings of continuous functions.



Chair incumbent Prof. Themba Dube



RESEARCH NICHE AREAS

Flagship projects undertaken within the respective colleges and research units are in direct support of Unisa five research focus areas.

INTRODUCTION

Unisa organises its research efforts into niche areas or cross-cutting themes that focus on the challenges facing South Africa and the rest of the continent, and lend themselves to transdisciplinary and multidisciplinary research.

There are five broad niche areas, namely:

- Knowledge generation, dissemination, application and human capital development in response to the current and future societal and stakeholder needs of South Africa and the African continent
- 2 The promotion of democracy, human rights and responsible citizenship
- Innovation and capacity building in science and technology
- Economic and environmental sustainability
- 5 Knowledge generation and the application of best practices in open, distance and e-learning (odel).

Below are a few of the examples illustrating the kind of research conducted under the respective research niche areas.

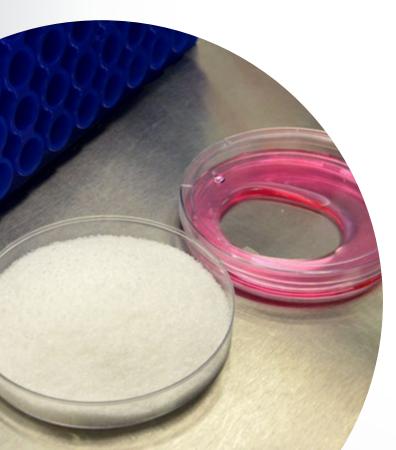


NICHE AREA 1

KNOWLEDGE GENERATION AND HUMAN CAPITAL DEVELOPMENT IN RESPONSE TO THE NEEDS OF SOUTH AFRICA

Magical molecule could relieve cancer patients' fatigue from chemotherapy

A molecule known to be effective in combating obesity may also be of benefit to cancer patients having chemotherapy treatment.



Biochemistry professor Monde Ntwasa is leading a team of researchers investigating the use of pyruvate in easing some of the side-effects of chemotherapy, notably the debilitating fatigue most patients experience. Chemotherapy not only kills cancer cells but normal ones as well. That's why patients on treatment feel so tired and have other side-effects such as nausea, diarrhoea and hair loss. With our strategy, it's possible that patients undergoing treatment might not feel quite so exhausted as is usually the case," says Ntwasa, who is part of the biotechnology group in the Department of Life and Consumer Sciences at the Unisa College of Agriculture and Environmental Sciences.

The strategy is to sabotage the cancer cells during chemotherapy by administering pyruvate. This is a molecule the body produces constantly when it breaks down glucose. However, when pyruvate is introduced externally in tandem with chemotherapy, the cancer cells cannot cope and they die.



A new strategy

Pyruvate in itself is not new, says Ntwasa, who has a PhD in Biochemistry from Cambridge University and delivered his inaugural lecture at Unisa in August 2017. "It has been patented by others for obesity. What is new is our strategy of introducing it exogenously (from an external source) during chemotherapeutic treatment."

This strategy has already passed its first hurdle: Intensive laboratory testing is being conducted using fruit flies. Healthy flies are kept in vials and given food laced with a chemotherapeutic agent. Pyruvate is then introduced and the researchers monitor the flies' recovery from the chemotherapy.



Magical molecule could relieve cancer patients' fatigue from chemotherapy (continued)

The fact that these are healthy flies, aside from the burden of chemotherapy, is important. "We wanted to see the effects of our strategy on normal cells," says Ntwasa. The next phase of the team's research will go several significant steps further. "What we would like to do in the pre-clinical phase is check whether the strategy works with all cancers and all combinations of chemotherapeutic drugs, and how it interacts with fast-growing normal cells."

Fast-growing cells in the body are found in hair follicles, nails, the lining of the stomach, the bowels and the mouth. Cancer cells, too, are fast growing. Conventional chemotherapy targets all fast-growing cells, normal and cancerous alike; therefore, both kinds are adversely affected when chemotherapy is administered.

Ntwasa and his team are seeking to answer the following questions: How will fast-growing normal cells react when pyruvate is introduced? Will they change their metabolic programming and, if so, recover from chemotherapy? Or will they, like the cancer cells, fight a losing battle and die?

At this point, the findings indicate that the team's pyruvate strategy works in protecting non-fast-growing cells during chemotherapy, implying that side-effects such as tiredness would be eased. For the rest, such as hair loss and diarrhoea, relief will likely come as the research proceeds.



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Prof. Sharon Smulders

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Counting the cost of tax compliance in SA

For the first time in South Africa, research is being conducted on the tax compliance costs of all taxpayers (individuals and small, micro-, medium and large businesses).

The researcher behind this pioneering project is Professor Sharon Smulders of the Unisa College of Accounting Sciences. "This kind of research was done 20 years ago in countries such as Australia but, other than my own research in 2012 on compliance costs for small businesses, it has never been conducted in South Africa. We are catching up," she says.

"Research of this nature costs quite a bit of money, especially if you decide on the interview route, which is very expensive. Without the grant from the Women in Research programme, I would not have been able to do this project," says Smulders, an associate professor in the College's Department of Financial Intelligence.

She is leading a team of four researchers who will spend the next three years assessing the tax compliance costs of South African individual taxpayers and businesses. "The aim is to take the findings to Parliament."

Indications are that costs are up

As a chartered accountant, Smulders has the support of the South African Institute of Chartered Accountants, which initiated the research because their members had indicated that in their experience, the taxpayer's cost of tax compliance and collection had increased significantly.

"They state that this increase, especially since 2008, is due to various additional compliance and disclosure procedures required of them by the South African Revenue Services (SARS)," she says.

SARS, with which Smulders has a good working relationship, has agreed to assist the Unisa team with their research. "SARS realises that tax compliance costs affect the economic behaviour of both individuals and businesses and seem to be connected to the level of compliance because the rising costs could result in an increase in tax evasion," she says.

"Therefore, the efficiency of a tax regime - a critical criterion for a fair tax system – can be assessed by reviewing the guantifiable data from a tax compliance cost survey. An efficient tax system, particularly in developing and transitional economies, is critical not only to increase government revenue but also to promote investment in a country and to increase employment, as well as the long-term growth of a country's economy."

In addition, she states that tax compliance cost surveys can pinpoint problems and burdensome areas but also assist in establishing a baseline against which progress can be monitored and measured.

This project is a good fit with Smulders' skills: For her PhD obtained at the University of Pretoria, she worked with researchers from Australia, Canada, the United Kingdom and New Zealand on a comparative study of tax compliance costs for small business. The Davis Tax Committee used her PhD report when they reviewed the small business tax policy proposals and mentioned in their report that her work had been very informative.

"That was guite satisfying," she says. "Having your research used to the benefit of your country is a huge honour."

NICHE AREA 2

THE PROMOTION OF DEMOCRACY, HUMAN RIGHTS AND RESPONSIBLE CITIZENSHIP

Land reform from a social policy perspective could transform South Africa

Addressed appropriately, land reform in South Africa has the potential to help eradicate poverty and bring about lasting, meaningful improvements to the wellbeing of its citizens.

This is according to Professor Jimi Adesina, holder of the DST/NRF SARChI Chair in Social Policy and a researcher at the Archie Mafeje Research Institute (AMRI).

"Social policy seeks to enhance the wellbeing of people and transform the economy. Land reform is an instrument that has the potential to address the five tasks of social policy," says Adesina. These five tasks are to raise productive capacity, protect residents in a country from the vagaries of the market and life-cycle, equitably redistribute the outcomes of economic growth, address social reproduction so that women are not penalised for bearing children and, finally, to encourage social cohesion and nation building.

"The key is having a clear understanding of what problem or problems you are trying to solve and how you can sustain the benefits in the long haul," says Adesina, who together with postgraduate students has conducted extensive research into the social policy impact of land reform in Zimbabwe. "The South African context is different from Zimbabwe's but there are lessons to be learnt," he says.



Prof. Jimi Adesina

"Land reform is an instrument that has the potential to address the five tasks of social policy..."



Land reform from a social policy perspective could transform South Africa (continued)

Land reform a metaphor for racial inequality in SA

"In Zimbabwe, land reform was a direct issue of land hunger in rural areas for production purposes. The pressure for radical land reform was driven largely from people in communal areas, which were overgrazed and overcrowded, invading commercial farms."

By contrast, the argument for land reform in South Africa is – for the most part – not about raising production capacity in rural areas. "Land is a proxy debate, a symbolic issue to represent racial inequality and injustice," Adesina says. "It is as metaphor for racial inequality and racial oppression." Adding to the complexity of land reform in South Africa is that it would have to address the different requirements of rural and urban areas, necessitating different mechanisms.

"In urban areas, land is about housing, which requires a social housing policy," Adesina says. "Here, the mechanism for ownership could be title deeds. In rural areas, land reform is more complicated as there are three tiers of land ownership: individual ownership, state ownership and trust land ownership."

Despite the contextual differences between Zimbabwe and South Africa, the experiences of the former could be salutary for South Africa.

What SA can learn from Zimbabwe

Where Zimbabwe did well, Adesina says, was to recognise that land reform would necessitate large-scale agrarian support for the beneficiaries, including financing, knowledge transfer and access to veterinary and other services, as well as infrastructure for downstream activities such as the marketing of produce.

He explains. "It is not the business of farmers to know how to sell maize in international markets. Zimbabwe understood that but its economy was in a mess – which is another lesson for South Africa to take to heart. Land reform needs strong agrarian support, the country needs to pay attention to its economy, and there should be sustained investment in healthcare, education, housing and roads. Without these, the economic benefits of land reform will not be realised. There must be investment in a national framework to support the land reform programme."

An increasingly critical issue to factor in is the accelerating exodus of people from the rural areas of South Africa into the cities. "If you do not invest in skills, schools, housing, etc, you end up with slums and ungovernable cities."

Thus, from a social policy perspective, the bottom line for land reform in South Africa is this: it is not an end in itself but a means to an end – eradicating poverty, equalising opportunity, transforming the economy and defusing the ticking time bomb synonymous with skewed land ownership and the legacy of injustice.





HIV/Aids cannot be eradicated while LGBTI students' rights are violated

Discrimination against and violations of the rights of lesbian, gay, bisexual, transgender and intersex (LGBTI) students have been directly implicated as factors in the increased risk of HIV infection.

Professor Azwihangwisi Mavhandu-Mudzisi of the Department of Health Studies in the College of Human Sciences says a concerted effort must be made to change negative attitudes towards LGBTI students – failing which, South Africa will not succeed in eradicating HIV/Aids.

"Sadly, as long as LGBTI individuals' rights are violated, they will continue to engage in sexually risky behaviours, which will make reaching a zero HIV infection rate an impossible mission," Mavhandu-Mudzisi said during her inaugural lecture at Unisa in February 2017. The topic was the violation of LGBTI students' rights and its impact on combating HIV/Aids.

A registered nurse, Mavhandu-Mudzisi's main research focus is on reducing the number of new HIV infections at rural universities and improving the quality of life of people living with HIV. She has been conducting research on the effects of discrimination since starting her academic and clinical career as an HIV/Aids coordinator at the University of Venda. Through her research, Mavhandu-Mudzisi has developed an advocacy, care and support model for LGBTI students, as well as a management model for university staff and students living with HIV.

A key finding of her research in a rural university setting is that LGBTI students encounter negative attitudes from many quarters – other students, staff and healthcare services.

Healthcare services tend to be heterocentric, making it difficult for LGBTI students to access these services, and healthcare practitioners tend to have heteronormative attitudes (seeing heterosexuality as the normal or preferred sexual orientation).

In her inaugural lecture, Mavhandu-Mudzisi noted that LGBTI students' rights were violated by the very healthcare professionals who should be helping them. Healthcare professionals were also more likely to focus on the care and support of other HIV-vulnerable populations, such as truck drivers and homeless people, than on LGBTI students. This happened despite the fact that the South African National Aids Council (SANAC) considers LGBTI individuals as one of the key HIV populations.

Negative attitudes mean that many LGBTI students engage in behaviour that increases the risk of HIV infection, such as by publicly maintaining a façade of being heterosexual while privately having partners of their actual orientation. "For the country to eradicate HIV/Aids and reach the envisioned zero HIV infection rate, a new level of zero stigmatisation of and discrimination against LGBTI students should be reached."

NICHE

AREA

3

NICHE AREA 3: INNOVATION AND CAPACITY BUILDING IN SCIENCE AND TECHNOLOGY

Senior lecturer scores a first for competition law in South Africa

Competition policy and law play a pivotal role in the South African government's economic and development plans.

Knowing this, Dr Phumudzo Munyai decided to do his PhD in Competition Law, becoming the first South African to complete this qualification.

"Competition law is the only field of law identified in the National Development Plan 2030 as 'central' to our country's economic development. Universities like Unisa should be able to respond appropriately by providing training and producing research that responds to this important national need," he says.

A senior lecturer in Competition, Trade Marks and International Trade Law at Unisa's Department of Mercantile Law, Munyai is not content with being the first in South Africa to achieve a PhD in the field. Now he has set his sights on new goals – developing a fullyfledged competition law master's degree and establishing a competition law unit at Unisa. "Both will help position Unisa as a leader in the field," he says. Judging by the response from South Africa's competition authorities, Munyai is on the right track. "His current position as a university academic is of great strategic significance for the propagation of competition law knowledge and skills in South Africa, and it will enable him to supervise more master's and doctoral students in competition law," commented Hardin Ratshisusu, Deputy Commissioner of the Competition Commission of South Africa.

"A number of our staff members have already expressed interest in registering for their master's and doctoral degrees in competition law, under his supervision, which we greatly encourage, and we will provide the necessary support, where appropriate," Ratshisusu added.

While his PhD in Competition Law is of strategic value to Unisa and even the economy, Munyai derives personal satisfaction from his achievement, too. "I am

someone who, by nature, is not inclined to dwell on an achievement, because there is always more to be done, yet I also appreciate what my achievement means to my family, especially my mother, who raised me while working as a domestic worker."

Competition law also enables Munyai to combine his two favourite academic disciplines: the law and economics. "Competition law offers a good combination of both, as it is 45% law and 55% economics. Working as a lecturer and researcher in competition law, I have never felt, at any point, that I have had to 'make it through my day'. Instead, I enjoy what I do and I am deeply immersed in it."

> Dr Phumudzo Munyai



AREA 4 ECONOMIC AND ENVIRONMENTAL 5USTAINABILITY

Energy village shows alternative power sources in action

A normal reaction when people hear that alternative energies can work just as well as, if not better than, conventional energies, is disbelief.

"community members can experience for themselves the power of three clean-energy solutions for households ..."



That scepticism can quickly change to understanding when people see for themselves how effective – and affordable – alternative energies can be. The "energy village" that a team of researchers from Unisa and the South African Medical Research Council (MRC) has built is the ideal place to showcase the benefits of alternative energies.

Located at the south Johannesburg premises of the Unisa Institute for Social and Health Sciences, the energy village consists of live demonstration facilities, at which community members can experience for themselves the power of three clean-energy solutions for households: solar, biogas and cool coatings.

"Different communities have different needs and so could benefit from different technologies. This is why we have two biomass technologies, a gasifier using plastic and paper waste, and a biodigester that consumes cow dung from farming," says Ralph Muvhiiwa of the Unisa Material and Process Synthesis (MaPS) unit, which is a partner in the community energy project.



Ralph Muvhiiwa

The gasifier that converts plastic and paper waste into syngas is probably better suited to the needs of people living in informal settlements, while the cow-dung-fuelled biodigester lends itself to use in farming communities. The research team is well aware that energy costs are a major consideration for low-income communities, which is why they are exploring costs and financial models as part of the project.

The biggest cost associated with a community energy project would be buying the equipment and associated appliances. Once the systems are up and running, they cost very little to run. The fuel that feeds them (sun, paper and plastic or cow dung) is virtually free, and maintenance costs are nominal.

Energy village shows alternative power sources in action (continued)

"We are designing a financial model to make energy provision sustainable, and we are speaking to corporate social responsibility partners," says MRC researcher David Kimemia. "But we are not promising anything for free, and communities will also have to bring something to the table."

That will be some time in the future, though, as the project is still in its early phases, assessing the technologies – and local communities' responses to them – at the demonstration site. Only later will the team go out to energy-poor communities to explore controlled implementation.

In the meantime, the three systems are doing their job well, says Kimemia. "The biogas is performing optimally; it boils one litre of water in three-and-a-half minutes, compared to LPG which does the same task in five minutes. The cool coatings lower the indoor temperature by between three and five degrees. The solar system is also performing well, although there is a need for extra batteries to store more power." NICHE AREA 5

OPEN DISTANCE LEARNING

True grit: the missing link in predicting ODL students' success?

High student dropout rates are a persistent problem for open and distance learning (ODL) institutions such as Unisa. Kelly Ann Young, Student Success Practitioner at the Student Retention Unit, thinks that "psychological grit" could help explain why some students succeed and others do not.

She says psychological grit is perseverance and passion for long-term goals. Someone who has it will maintain effort and interest over years, despite failure, obstacles or an apparent lack of progress.

"Grit has shown to predict success and retention across numerous educational contexts, including among West Point cadets in the United States Military Academy and undergraduate psychology students at the University of Pennsylvania," says Young.

"To date, there is limited published research available on psychological grit and the value it may add to understanding and predicting retention among ODL students. With ODL environments being particularly prone to lower student retention, a closer look into this probable predictor is justified." Young herself has been taking a closer look into psychological grit and presented some of her initial findings at the 24th annual conference of the Southern African Association for Institutional Research (SAAIR) held in Namibia from 23 to 26 October 2017.

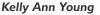
Honours students show their grit

For her research, she has been investigating the "grittiness" of 803 Unisa honours students across all age groups, races and languages, as well as gender.

"The majority of Unisa students appear to have grit," says Young, who used a grit-scoring system from 1.00 to 10.00. "The majority of the sample appear to exhibit moderate to strong levels of grit, with minimal students clustered at the extremes. No participants in the current sample were classified as 'not at all gritty'." She adds that grit is not associated with gender or employment status. Age and grit are positively correlated, but weakly. Grit is weakly associated with home language, ethnicity and disability.

The year 2018 should provide more insights into whether grit holds promise for ODL. Whether the participants reregister (or don't) in the 2018 academic year, will assist Young to ascertain the significance and the predictive value of grit (or the lack thereof) in describing retention among those studying at a distance institution.





RESEARCH NICHE AREAS



How learning has gone from open to closed, and to open again

In the past decade, a growing trend has been seen around the world of opening up learning and making it accessible to all.

Although open learning might thus seem to be a new concept, openness in education was in fact around long before the written word, says Professor Mpine Makoe, Head of the Institute for Open Distance Learning at Unisa.

Centuries ago, knowledge was transmitted through oratory tradition, and these oratory skills were passed on through doing, she says. Orators and philosophers would deliver public lectures at no cost, and people would stop by and drink from the foundation of knowledge.

"The open curriculum of that era was driven by what students wanted to listen to or leave out – in the same way as present-day knowledge and content are easily available on the internet. People go online and choose the information in which they are interested," says Makoe.

She says it is interesting to observe that the current open education principles are guided by similar characteristics of flexibility, learner-centredness, accessibility and lifelong learning that influenced the rise of open education thousands of years ago. "Since then, formal education has taken many turns, from being completely open to being completely closed. The rise of the current open scholarship has been attributed to the impact of technology on every facet of our lives." This, too, is not a new phenomenon. "Throughout history, different types of technologies have influenced education," Makoe says. "The biggest game changer of the way in which knowledge was transmitted was the invention of the printing press. Books could reach larger audiences and people could access knowledge anywhere and at any time.

"Although books were very expensive when they were first published, they became cheaper and more accessible over the years, in the same way that computers were almost unaffordable when they had been introduced, and now many people can access the internet on their mobile phones."

In the past 10 years, the open learning movement has gained increasing momentum. A few of the key milestones reached are set out below:

- In 2002, the Budapest Open Access Initiative was launched, and it was aimed at making research articles in all academic disciplines freely available on the internet.
- In 2003, the Berlin Declaration on Open Access was launched to promote the internet as a medium for disseminating knowledge globally. Unisa is one of six South African institutions that signed the Berlin



Prof. Mpine Makoe

How learning has gone from open to closed, and to open again (continued)

Declaration, demonstrating the University's commitment to supporting open scholarship through the development of open educational resources (OERs).

 In 2007, the Cape Town Declaration on Open Education was signed, becoming one of two important OER declarations that have originated in Africa. The second was the 2009 Déclaration de Dakar sur les Ressources Educatives libres (REL), supported by UNESCO and other leading international organisations.

Both African-conceived declarations were speaking to the need for accelerating efforts to promote open resources, technology and teaching practices in education. "The main principle of openness in education is to deal with the fundamental right of access to education as outlined in UNESCO's Universal Declaration of Human Rights," Makoe says.

This is based on the philosophy of knowledge as a common good – just as it was in those ancient days, when philosophers and orators shared their knowledge with all who wanted to listen.

RESEARCH **HIGHLIGHTS**

2017 was a year of many highlights confirming the university's research excellence and researchers' outstanding performance.

Notable was the awarding of two United Nations Educational, Science and Cultural Organization (UNESCO) chairs, namely the UNESCO Chair in Early Childhood Education and the UNITWIN/ UNESCO Chair in Open Distance Learning (ODL).

This section features some of 2017's highlights.

EXTERNAL RESEARCH AWARDS

Two UNESCO chairs awarded in the same year

In the eyes of UNESCO, Unisa has the potential to have a massive impact on higher education in South Africa and beyond its borders, especially on the young generation and marginalised communities. This recognition translated into the awarding of not one but two UNESCO chairs to Unisa in 2017.

In June 2017, Unisa was selected as the co-host of the UNESCO Chair in Early Childhood Education, Care and Development, which for almost ten years had been

hosted by the University of Victoria in Canada. The two universities now host the chair together – Professor Alan Pence is the Canadian chairholder and Professor Hasina Ebrahim the South African chairholder.

In October 2017, a second chair was established, namely the UNITWIN/UNESCO Chair in Open Distance Learning (ODL), under Unisa's Professor Moeketsi Letseka. Both chairs are located in the College of Education and have strong support from international authorities in the fields of ODL and early childhood education respectively.





Prof. Moeketsi Letseka

FOREMOST ODL PLAYERS PLEDGE SUPPORT

Unisa's successful application to host the ODL chair included personally signed letters of support from some of the foremost ODL role-players on the continent and in the rest of the world.

Among them are Mr Gard Titlestad, Secretary-General of the International Council for Distance Education (ICDE); Professor Asha S Kanwar, President and CEO of the Commonwealth of Learning; Dr Bakary Diallo, Rector of the African Virtual University; Professor Tsepo Mokuku, Dean of Education at the University of Lesotho; and Dr KS Sukon, Director-General of the Open University of Mauritius. Over four years, the UNITWIN/UNESCO/Unisa Chair in ODL will develop a critical mass of knowledgeable, highly qualified ODL researchers, scholars and managers with the know-how to help to ensure the success of ODL students and to develop appropriate ODL teaching technologies and methods.

The first cohort of postgraduate students was set at four ODL master's and six ODL doctoral students from South Africa and the Southern African region, with similar cohorts in each subsequent year, says Unisa's Professor Moeketsi Letseka. "This will ensure a sustainable pipeline of postgraduate students who can be trained to provide the much needed critical mass of highly qualified ODL practitioners."

AFRICAN CHILDREN AND CAPACITY BUILDING ARE PRIORITIES

Professor Hasina Ebrahim, joint holder of the UNESCO Chair in Early Childhood Education, Care and Development, says Unisa's application was supported by the incumbent chairholder, Professor Alan Pence of the University of Victoria.

"This partnership is indeed an exciting one," she says. "Professor Pence brings a wealth of experience of working with the First Nations (indigenous people) in Canada and with leaders in Africa, and this is synergistic with Unisa's capacity-building and knowledge-production programmes." Professor Ebrahim's main priority as co-holder of the chair is to ensure that African research on early childhood education policy, practice and teacher development is foregrounded. "We need a new cadre of scholars and researchers on the continent. A concerted effort must be made to promote research that highlights the African realities and conditions impacting on childhood education," she says. "Africa has a rich cultural heritage that serves as a resource to shape the lives of African children. We need our own evidence to highlight our issues and map a way forward."



Prof. Hasina Ebrahim



EXTERNAL RESEARCH ACCOLADES AND NOTABLE MEMBERSHIPS

In 2017, a number of Unisa researchers received prestigious awards from and memberships of organisations and institutions outside the University. External recognition serves as an independent measure of research performance, gives recognition to academics' research provess and contributes to the research profile of the university at large.

KWAME NKRUMAH AWARD

Professor Malik Maaza, incumbent of the UNESCO-Unisa Chair in Nanosciences and Nanotechnology, received the African Union Kwame Nkrumah Award for Scientific Excellence (AUKNASE).

This is a major recognition at a continental level for his pioneering work in science and technology. South African scientist and academic Robert Millar was jointly awarded with Maaza. Both received this prestigious award during the African Union (AU) Summit in Addis Ababa in February. The award is the AU recognition of the highest level of the AUKNASE programme and celebrates top African scientists for their valuable achievements, research and discoveries.

Maaza was also awarded memberships of the USA-Africa Edward Bouchet Abdusalam Foundation (EBASI) and European Academy of Sciences (EAS) respectively.

Prof. Malik Maaza

UNESCO INSTITUTE FOR LIFELONG LEARNING (UIL) HONORARY FELLOWS

The UNESCO Institute for Lifelong Learning has conferred an honorary fellowship on Unisa's Professor Catherine Odora Hoppers, incumbent of the DST/ NRF South African Research Chair in Development Education, and Professor Veronica McKay, Executive Dean of the College of Education.

The awarding of this title acknowledges their dedication to working in the areas of UIL's mandate and their substantial contribution to the development of lifelong learning on a global scale.



Prof. Catherine Hoppers

Prof. Veronica McKay

RESEARCH HIGHLIGHTS



NSTF-SOUTH 32 AWARDS

Professor Diane Hildebrandt, Director: Material and Process Synthesis Research Unit (MaPS), and Professor Bhekie Mamba, Executive Dean of the College of Science, Engineering and Technology and Director: Director of the Nanotechnology and Water Sustainability Unit (NanoWS), were winners at the NSTF-South 32 Awards on 29 June 2017 in recognition of their outstanding contributions to science, engineering and technology (SET) and innovation in South Africa.

The Eskom-sponsored award for engineering capacity development by individuals over the last five to ten years, regardless of nationality or citizenship, went to Hildebrandt for demonstrating outstanding leadership in increasing the participation of young researchers, while Mamba received the NSTF-Water Research Commission Award towards achieving sustainable water management, knowledge generation, and solutions. This is a new award.

2017 CHAMPION OF RESEARCH CAPACITY DEVELOPMENT AND TRANSFORMATION

Professor Diane Hildebrandt, Director: Material and Process Synthesis Research Unit (MaPS), was named the 2017 Champion of Research Capacity Development and Transformation at South African Higher Education Institutions at the NRF Awards in September 2017.

The event recognised individuals for exceptional contributions towards developing human capacity and knowledge generation in South Africa.

Prof Hildebrandt was cited at the awards as having met the challenge of developing South Africa's next generation of researchers and engineers while at the same time exploring new and cleaner methods of making energy accessible to all. She has successfully supervised 49 MSc and 54 PhD students to completion of which 54 were black researchers. A number of students have gone on to win awards in their fields, underscoring her commitment to mentoring the next generation of scientists.



Prof. Bhekie Mamba (middle) after receiving his award from the Minister of Science and Technology, Naledi Pandor (left), and Water Research Commission CEO, Dhesigen Naidoo (right)



RESEARCH HIGHLIGHTS



WISA AWARD

Professor Azwihangwisi Mavhandu-Mudzusi of the Department of Health Studies in the College of Human Sciences, won the South African Women in Science Awards (WiSA) Distinguished Woman Researcher award in Humanities and Social Sciences in August 2017. Professor Venitha Pillay, Associate Professor in the Department of Educational Leadership and Management, College of Education, also did Unisa proud as runner up in the same category.

Minster of Science and Technology, Naledi Pandor, Prof. Azwihangwisi Mavhandu-Mudzusi, Prof. Venitha Pillay, Prof. Saloshna Vandeyar (University of Pretoria, 1st runner up), and Minister of Energy, Mmamoloko Tryphosa Kubayi.



ACADEMY OF SCIENCE OF SOUTH AFRICA (ASSAF) AND SOUTH AFRICAN YOUNG ACADEMY OF SCIENCE (SAYAS) MEMBERSHIP

ASSAf inaugurated a record number of 41 leading scientists as new members at its annual awards ceremony on 11 October 2017, increasing the total membership to 542. Newly included in this prestigious academy is Professor Sonja Bosch in Unisa's Department of African Languages.

In addition, nine new members of SAYAS were inaugurated, including Chris de Wet, Associate Professor of New Testament and Early Christian Studies in Unisa's Department of Biblical and Ancient Studies. Bosch's main research focus is on the technological development of African languages, in particular the linguistic aspects of natural language processing of Nguni languages. She is project leader of the African Languages Wordnet project and the chairperson of the Human Language Technology Expert Panel of the Minister of Arts and Culture.

De Wet is an international expert on ancient Greek and Roman slavery and labour exploitation, and has published two monographs on the topic. Prof. Sonja Bosch

Prof. Chris de Wet

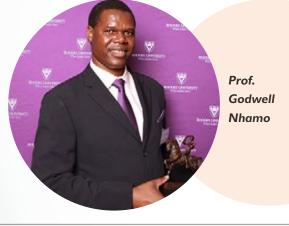


SAMRC SCIENTIFIC MERIT AWARD

Professor Ashley van Niekerk, Deputy director of the South African Medical Research Council (SAMRC) and Unisa's Violence, Injury and Peach Research Unit in the Institute for Social and Health Sciences (ISHS), received the SAMRC Silver Medal for Research Award. The SAMRC strongly supports excellence in health research and has established a set of medal awards to recognise world-class science. The awards are among South Africa's most prestigious and are dedicated to contributions to health research in South Africa.



Prof. Ashley van Niekerk receives his SAMRC Silver Medal from Prof. Jeff Mphahlele, Vice-President of SAMRC



OLD RHODIAN AWARD

Professor Godwell Nhamo, incumbent of the Exxaro Chair in Business and Climate Change in the Institute of Corporate Citizenship, received the Old Rhodian award from his alma mater, Rhodes University. This award is offered in recognition of the work he has done over the years. Nhamo completed his doctoral studies at the University in the minimum time of two years in 2005.



SARIMA BOARD

Ayanda Noma, Unisa's Director of the Innovation and Technology Transfer Directorate (DITT), has been appointed to the South African Research and Innovation Management Association (SARIMA) Board, and is now the Vice-President for Innovation and Technology Transfer of the association.



PRESIDENT OF SOUTHERN AFRICAN ASSOCIATION FOR COUNSELLING AND DEVELOPMENT IN HIGHER EDUCATION (SAACDHE)

Unisa's Director for Counselling and Career Development, Dr Matome J Mashiapata, was elected as the president of SAACDHE at the association's 38th annual conference in September 2017.

As the president, Mashiapata will be tasked with the responsibility to provide strategic leadership and management of the association.

SAACDHE's goal is to provide guidelines to higher education institutions on the role, function and service arrangements of the counselling support services units, ensuring highest level of professionalism among practitioners and international benchmarking in the design and delivery of counselling, careers and development services.



Dr Matome Mashiapata

UNISA SIGNS MOA WITH TIANJIN POLYTECHNIC UNIVERSITY OF CHINA

As a part of strengthening international relations, Unisa and Tianjin Polytechnic University of China (TJPU) signed a memorandum of agreement (MoA) in December 2017.

The universities will collaborate in original and applied research of mutual interest. They will also cooperate in improving teaching programmes and the development of initiative teaching strategies. This partnership will create an environment for research, educational and training excellence, and provide a platform to the open exchange of ideas. Prof. Qingxin Yang (President: TJPU), Prof. Ho Wei, (Chair: Department of Mechanical and Industrial Engineering, Unisa), Prof. Bhekie Mamba (Executive Dean: College of Science, Engineering and Technology), and Prof. Xiaoming Liu (Dean: School of Electrical Engineering and Automation, TJPU)





INTERNAL RESEARCH AWARDS

Over the past few years, Unisa has made significant investments, both in terms of financial and human resources, to create a nurturing and enabling research and innovation environment. Research incentives and research awards and prizes, as highlighted in this section, make an important contribution towards cultivating such a positive environment for Unisa researchers.

UNISA RESEARCH AND INNOVATION AWARDS

A grand total of 71 research awards were handed out on 2 March 2018 when Unisa held its annual Research & Innovation awards ceremony, the seventh since the awards were introduced.

CHANCELLOR'S PRIZE FOR EXCELLENCE IN RESEARCH

This is the most prestigious prize awarded to qualifying researchers at Unisa. It is awarded for academic research of the highest quality published during the preceding two years in highimpact journals in the researcher's discipline.

Receiving the 2017 Chancellor's Award for Excellence in Research were (from left Prof. Babatunde Fagbayibo (College of Law), Prof. François Mulenga (College of Science, Engineering and Technology School), Prof. Anthony de Villiers Minnaar (College of Law), Prof. Patrick Ngulube (Graduate School of Business Leadership), Prof. Renier Steyn (Graduate School of Business Leadership), Prof. Azwihangwisi Mavhandu-Mudzusi (College of Human Sciences), Prof. Themba Dube (College of Science, Engineering and Technology School), Prof. Godwell Nhamo (College of Economic and Management Sciences) and Prof. Barry Ackers (College of Accounting Sciences).





2017 WOMEN'S AWARDS FOR EXCELLENCE IN RESEARCH

Unisa has put in place targets towards the empowerment of women researchers in its Research and Innovation Strategy.

There are set targets for, among others, National Research Foundation (NRF)–rated women researchers and women researchers holding doctoral qualifications. The Women in Research Awards is yet another initiative aimed at acknowledging research and innovation excellence by Unisa's women researchers. The awards honour and celebrate the achievements of women in their respective fields of research.

The Woman in Research Award is divided into the Leadership in Research Women Award, the Emerging Researcher Award and the Youngest Women Doctoral Award.

The Leadership in Research Award is awarded to researchers who, in the past five years, have demonstrated their outstanding leadership in research by publishing widely, contributing to the advancement of research in their field, participating in the development of scholars through mentorship, providing supervision to a substantial number of postgraduate students, receiving recognition and awards in their fields as achievers and participating in community and/or industry engagement.

The Developing Research Award aims to acknowledge research and innovation excellence by Unisa's women researchers and encourages aspiring PhD candidates to become established researchers.

Women in Research Awards were presented to six women researchers – two in the emerging researcher category, three in the leadership category, and one as the youngest female doctoral graduate of 2017. The latter went to Dr Shandré Jansen van Rensburg from the College of Law, who was 28 years old when she obtained her PhD.

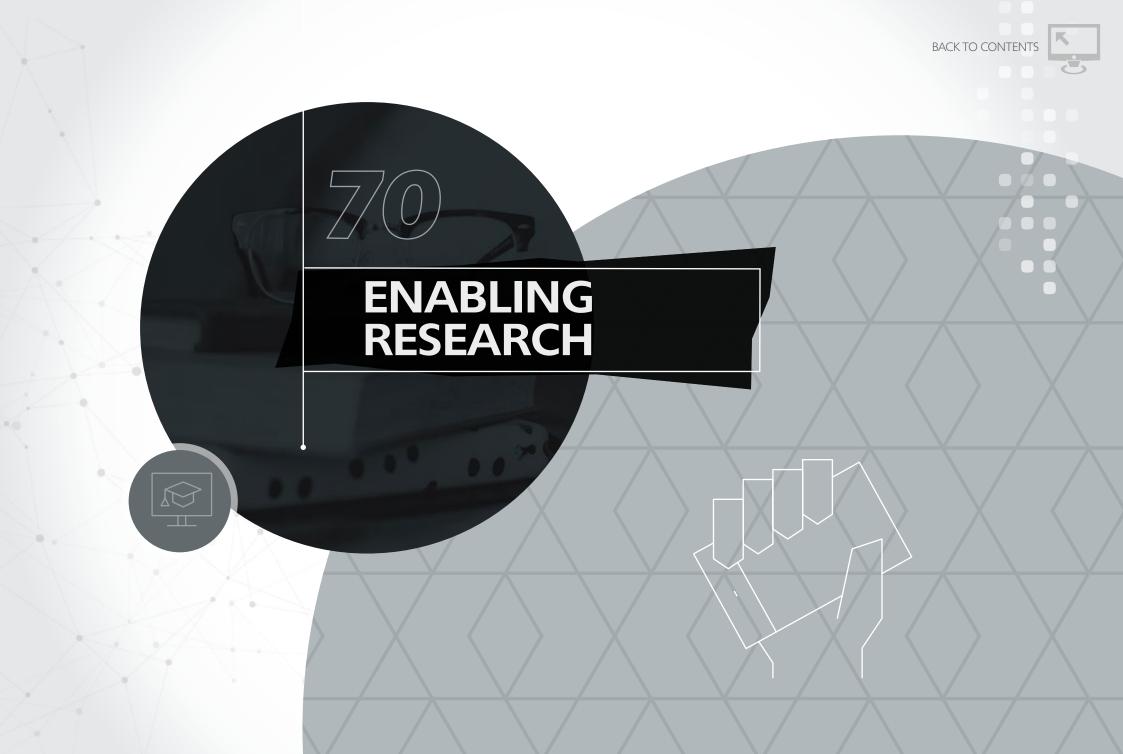


Women in Research winners were Thulile Shandu-Phetla (College of Human Sciences – Emerging researcher), Dr Shandré Jansen van Rensburg (College of Law – Youngest female doctoral graduate), Prof. Hasina Ebra him (College of Education – Leadership) and Prof. Amanda Spies (College of Law – Emerging researcher)



HIDDINGH-CURRIE AWARD

The prestigious Hiddingh-Currie Prize (2017/2018) was awarded to the book Three Decades of Making Space: Magnet Theatre, edited by Ms M Lewis (USA) and Mr A Krueger (Grahamstown). The Hiddingh-Currie Award is a literary award given out annually to an outstanding author of published work within Unisa Press. It aims to encourage and nourish specialised skills in academic research and scholarly publishing.





ENABLING RESEARCH

UNISA PRESS

As an academic publishing platform dedicated to disseminating excellent scholarly content about the African continent, Unisa Press performed well in 2017.

Apart from surpassing its journal and book publishing figures for 2016, the Press continued to strengthen its digital publishing skills, thus extending its reach and achieving cost reductions.

Journals published

During 2017, Unisa Press published 44 journals, one more than in the previous year, covering a variety of disciplines, including humanities, developmental studies, decolonisation, African philosophies and renaissance, education, economics and open distance learning.

The newcomer to the portfolio was the *Southern Africa Business Review*, a refereed and scientific research journal of Unisa's College of Economic and Management Sciences.

The 44 journals published included 22 co-published with Routledge Taylor and Francis, with whom Unisa Press works closely. The focus of this partnership is on quality, timeliness, content, reputation, accreditation, reach and portfolio growth. Co-published Unisa Press titles are increasingly accessible worldwide through their inclusion in Taylor and Francis online sales deals and access arrangements for the developing world. Currently, five co-published titles have an impact factor, these being *Critical Arts, Language Matters, Agrekon, African Journalism Studies and South African Historical Journal.*

In all, Unisa Press published 82 issues of the 44 journals, which collectively had an article count of 774.

Books published

The 11 scholarly books published in 2017 offered fascinating insights into contemporary topics such as violence in schools and historical themes whose legacy is still felt in Africa today, such as the slave trade.

A number of the books published explored African philosophy in contexts such as reincarnation and life purpose and meaning. Democratisation was the focus of two books, one on South Africa and the other on Botswana.

Two commissioned books were published during the year, namely *Touched by Biko* (Part 2, interviews), by Andile M-Afrika, and *Chaka: Die nuwe Afrikaanse vertaling*, by S Swanepoel.

The 2017/18 Hiddingh-Currie Award, presented annually to encourage and nurture specialised skills in academic research and scholarly publication, was awarded to *Three Decades of Making Space: Magnet Theatre*, edited by Ms Megan Lewis (USA) and Mr Anton Krueger (Grahamstown).

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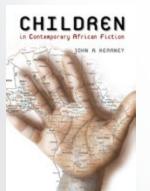








PHILIP QUAQUE'S Letters to London 1765–1811





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Table 1: Books published in 2017

| Title | Author(s) | |
|---|--|--|
| Scholarly books | | |
| Philip Quaque's letters to London, 1765–1811 | Professor Adélékè Adéèkó' | |
| Researching Power and Identity in African state formation | MR Doornobs and WMJ Van Binsbergen | |
| Violence in Schools: South Africa in an International Context | Vusimuzi Mncube and Clive Harber | |
| Children in contemporary African fiction | John A Kearney | |
| Reincarnation: A Question in the African Philosophy of Mind | Dr Hasskei Mohammed Majeed | |
| Pimp the pain: Purpose Inspired Dialogues | Dr Solomon Makola | |
| Indigenous Shona Philosophy | Professor Pascah Mungwini | |
| Road to Democracy Series Volume 7: 1976 Soweto uprisings | SADET | |
| Botswana's Parliamentary Democracy Revisited | Edited by Sebudubudu, Tsie and Osei-Hwedie | |
| Still at Large: Dispatches from South Africa's Frontiers of Politics and Art | Chris Thurman | |
| The Wrecking of the 'Haarlem' (1647): The Origin of Cape Town | Dr Bruno EJS Werz | |
| Commissioned books | | |
| Touched by Biko (Part 2, interviews) | Andile M-Afrika | |
| Chaka: Die nuwe Afrikaanse vertaling | C Swanepoel | |
| Chaka: Die nuwe Afrikaanse vertaling | C Swanepoel | |

Unisa Press has an impressive collection of 158 books which are available on open access. Housed within the Unisa Library's Institutional Repository, access is free and subjects range from African philosophy, Law, Literature, Education and History, to name but a few.

Transformation in publishing

Transformation is part of Unisa Press's mandate, necessitating scrutiny of the demographics of authors and editors.

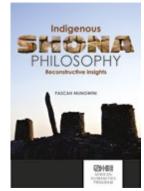
In 2017, 88% of published work originated from male authors, comprising 38% white males and 50% black males. African females comprised 13% of authors (as co-authors).

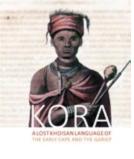
Future initiatives

Lessons learned in 2017 will form the basis for new developments in Unisa Press in 2018 and onwards.

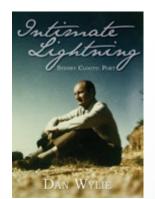
One such initiative is to finalise the Press Commissioning strategy so as to ensure that high-profile authors are targeted on topical issues of national importance. Another priority for 2018 is to solicit manuscripts or proposals from female authors and from authors dealing with ODL issues. Special initiatives will be to improve relations with the various stakeholders of Unisa Press, particularly authors, and to forge close collaborations with other national and international research institutions and the Department of Higher Education and Training.

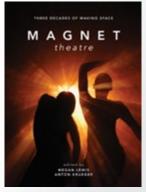
Further, Unisa Press will give priority to finalising the open access framework for its books and journal publications.





MENÁN DU PLESSIS







Over the decades, the Unisa Library has shown itself to be adept at incorporating new technologies and formats into its services and collections.

UNISA LIBRARY

The Unisa Library collaborates with the Department of Research, the college research coordinators and the College for Graduate Studies to augment research support.

Within the Portfolio of Research, Postgraduate Studies, Innovation and Commercialisation, the library strives to advance the realisation of excellent research aligned with the strategic focus areas of the university. Over the decades, the Unisa Library has shown itself to be adept at incorporating new technologies and formats into its services and collections. In this digitally connected era, the library has ensured that its research support matches the changing needs of library users, who are increasingly using electronic technology in all spheres of their lives, while giving researchers more and more opportunities to enhance their research e-visibility.

Research quality and research performance evaluation

In support of quality research outputs, the library offers extended services from the vast range of research resources, research management tools and online selector tools.

Its staff advise and engage with researchers on the selection and identification of quality journals and publications, and provide support and advice on predatory material to avoid.

These services aim to enhance research outputs for the benefit of both the researcher and the university.

In this context, the Unisa Library also compiles disciplinespecific training material for researchers on quality journals in which to publish, and uploads these on myUnisa departmental websites. The library offers group and individual training to optimise the valuable research resources and research services available to clients. In addition, the library arranges publisher seminars and workshops covering topics on research outputs and research quality, including information on the publishing process, ethics in publishing and current developments and trends in scholarly publishing.

Other resources are made available online for researchers include comprehensive library guides, with specific reference to research support.

In support of research performance evaluation, the library creates researcher performance/evaluation reports using library resources and tools. A comprehensive service is offered to assist researchers with research matters such as NRF rating applications. The associated services include creating an awareness of e-visibility, creating profiles for researchers, reporting of H-Indexes in the NRF rating application system, linking the researcher's ORCID identity to the NRF rating application system, and creating awareness of the Unisa Institutional Repository and open access.





Library collections

The Unisa Library has proactively planned for the development of collections that would address the diverse academic needs and programmes in Unisa.

A total of 26 149 information resources were added to the collection during 2017 and 73% of these acquisitions were research-based.

The library branches remain a very vital part of the Unisa Library. As tables **2 and 3** illustrate, there are significant library collections at the various branches and mobile libraries.

Table 2: Size of collection per branch

| Branch | 2017 stock items |
|------------------|------------------|
| Cape Town | 22 488 |
| Durban | 30 959 |
| East London | 9 214 |
| Ekurhuleni | 11 416 |
| Ethiopia | 11 693 |
| Florida | 224 061 |
| Johannesburg | 18 398 |
| Muckleneuk | 2 163 349 |
| Nelspruit | 7 282 |
| Pietermaritzburg | 6 626 |
| Polokwane | 18 959 |
| Rustenburg | 10 077 |
| Sunnyside | 18 926 |
| Total | 2 553 448 |

Table 3: Mobile libraries: Total number of items in stock, 2017

| Mobile buses | Items in stock/ collection | Items added | Total |
|--------------|-------------------------------|-------------|--------|
| Cape Town | 6 589 | 214 | 6 803 |
| Polokwane | 6 554 | 199 | 6 753 |
| Total | 13143 | 413 | 13 556 |





Open access at the Unisa Library

The Unisa Institutional Repository (Unisa IR) once again played a key role in providing open access to Unisa research output during 2017.

The repository had 19 971 items at the end of 2017, representing growth of 13% in research outputs and 9% in electronic theses and dissertations (ETDs) added. The UnisalR enjoyed 8.2 million views during the year.

In October 2017, the library participated in the International Open Access week and showcased various open access tools and resources at exhibitions held at the Muckleneuk campus and the Science Campus in Florida. The library also hosted the 2017 Unisa Open Scholarship Seminar, where speakers presented papers on topics that addressed creative commons licensing, open access and changes to the academic publishing model, as well as research data management (RDM), open educational resources (OERs) and predatory publishing.

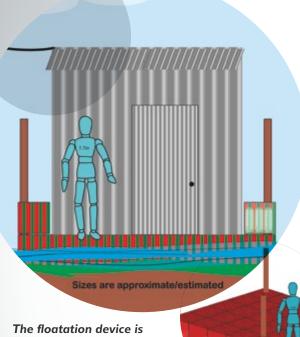
Archives

The Unisa Library archives received 18 donations from various individuals and organisations.

One new noteworthy collection was the State Theatre/ PACT collection, transferred by the State Theatre. Papers by Dr Wolfram Kistner are also a new acquisition, with material from the struggle years. The updating and enriching of the Institutional Memory (Unisa Archives) continued, with a variety of content added, including Council, Senate and committee minutes, graduations and inaugural lectures.

ENABLING RESEARCH





designed to keep structures above water during flooding.

DIRECTORATE INNOVATION AND TECHNOLOGY TRANSFER

After a late start compared to universities with well-established intellectual property (IP) portfolios, Unisa is making headway in working with its staff and students to develop and commercialise their innovations and inventions.

During 2017, the university's Commercialisation framework was approved and there was a marked increase in the number of processed patent applications. Further seed funding for Unisa projects was received from the Technology Innovation Agency (TIA).

IP disclosures and patents

The Directorate Innovation and Technology Transfer (DITT) received 21 IP disclosures in 2017.

This was 36% fewer than the 33 disclosures received in 2016, and can be attributed to loss of capacity within the directorate after several key staff members resigned to pursue other opportunities.

A total of 19 patent applications were processed during the year. Two of these were new provisional patent applications, three were Patent Cooperation Treaty (PCT) applications, and 14 were complete and regional applications.

The number of granted patents in the name of Unisa grew to five. This was as a result of two patents being granted to Unisa in 2017 and a further two patents being assigned to the university. The table below gives details of the inventions for which patents were granted in 2017.

| Year | Title | Inventors | Jurisdiction |
|----------------|--|------------------------|--------------|
| 2012 | Smart controller solar backup and energy supplement system, for grid line power demand systems | Prof. L Snyman | South Africa |
| 2013 | Self-sustainable solar and thermos-electric supply system for domestic households | Prof. L Snyman | South Africa |
| 2016 Method an | | Dr Wei Ho | |
| | Method and apparatus for treating a fluid | Prof. V Vallabhapurapu | South Africa |
| | | Prof. I Hofsajer | |
| 2017 | Roof solar to thermal energy | Prof. L Snyman | South Africa |
| 2017 | Floatation device | Patricia Gouws et al | South Africa |

Table 4: Patents granted





Seed funding

Through the directorate, Unisa submitted eight projects to the TIA Seed Fund. Four of these projects were funded.

This brings the Seed Fund portfolio to eight projects. Significant progress has been made in the four projects funded in 2016, specifically in developing prototypes and undertaking detailed market analysis. The experience with these projects will be invaluable in formulating technology development pathways and commercialisation strategies.

Table 4: TIA funded projects, 2017

| Title | Applicants | Amount |
|---|---------------------|-----------|
| Solar driven membrane water purification system | Prof. S Mhlanga | R 610 000 |
| Fixed bed reactor | Prof. D Hildebrandt | R 650 000 |
| Fabrication of exfoliated graphite-based nano | | |
| composites photo anodes for photo-electrochemical | Dr B Ntsendwana | R 650 000 |
| degradation of organic pollutants in water | | |
| Sprinkler guard | Prof. H Stoffberg | R 596 000 |

InnovationSense for staff and students

Educating staff and students about IP and the value that can be derived from it was an important focus in 2017.

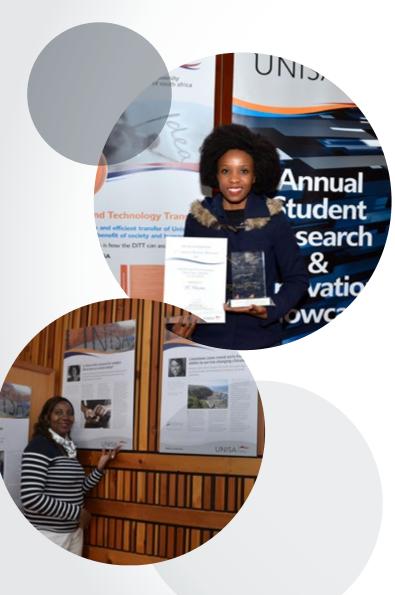
With this in mind, the DITT held 16 *InnovationSense* workshops at nine centres in South Africa, including Bloemfontein, Cape Town, Durban, East London, Ekurhuleni and Polokwane. These workshops introduced

participants to innovation, and the basics of IP and commercialisation.

A total of 422 staff and students attended the workshops, representing an increase of 65% on the previous year's attendance.

ENABLING RESEARCH





Student Research & Innovation Showcase

In August 2017, for the sixth consecutive year, the annual Unisa Student Research & Innovation Showcase was held.

This three-day event promotes research and innovation among students and is jointly hosted by the Unisa National Student Representative Council and the Research, Postgraduate Studies, Innovation and Commercialisation Portfolio.

In preparation for the event, a call for research papers was issued in March 2017. In order to assist the students to prepare their research papers, information and workshops on how to write a research paper were held in 23 Unisa sites. These sessions attracted more than 3 100 students.

In 2017, an online registration and submission system was implemented and it was noted that the students

experienced various challenges with it. 55 research papers were received and reviewed by discipline-specific technical committees, who deemed 32 of these to be of high quality for presentation during the Student Showcase.

The 2017 event consisted of student presentations, workshops and exhibitions, as well as pre-showcase workshops on entrepreneurship, the basics of product design, ethics and presentation skills. The event also includes a discussion session on gender-based violence and the panel included Ms Grizelda Grootboom, the author of a book titled *Exit*. There was also an engagement session with a young entrepreneur, Ms Khayalethu Cotoko, CEO of X-Sparks.

Innovation Challenge for students

One of the highlights of the student innovation calendar at Unisa is the annual Innovation Challenge, which seeks to encourage students to develop innovative projects that solve a clearly identified societal challenge.

The 2017 Innovation Challenge commenced in March and April 2017, when the directorate organised workshops on innovation in 23 centres around South Africa, from Newcastle, Mthatha and Kimberley to Richards Bay, Makhado, Potchefstroom and Rustenburg. This resulted in 69 applications for Innovation Challenge grants, three of which were eventually selected.

The winning projects and entrants were M Manyediwane with a vacuum toilet system, FH Mudau with ionexchange metal nanocomposite membranes for removal of pathogens and KM Nare with plant-made energy tonics for affordable milk.

Table 5: Innovation Support Programme grants, 2017

| Name | Title of innovation | College | School/ Unit | Amount |
|-------------------------|--|---------|---------------------------|-----------|
| Dr B Ntsendwana | Fabrication of exfoliated graphite- based nanocomposite photo anodes for photo electrochemical degradation of organic pollutants in water | CSET | NANOWS | R 100 000 |
| Prof. E Nxumalo | Graphene-based hetero- structures for a water filter | CSET | NANOWS | R 100 000 |
| Prof. H Stoffberg | Sprinkler guard | CAES | Environmental Sciences | R 100 000 |
| Prof. H Stoffberg | Flexible irrigation sprinkler riser pipe | CAES | Environmental Sciences | R 100 000 |
| Ms VS Vallabhapurapu | Fully biodegradable and flexible polymer-nano composite resistive memory for computers | CSET | Physics | R 100 000 |

Innovation Support Programme for staff

This programme is similar to the Innovation Challenge, the difference being that it targets Unisa staff instead of students.

In 2017, two calls were issued for staff to apply for the Innovation Support Programme (ISP), culminating in 15 applications. The programme selection committee assessed the applications and approved five for funding. The successful projects were:

International student exchange

Unisa students who excelled at events such as the Student Showcase and the Innovation Challenge were given the opportunity to participate in international student exchange programmes.

In 2017, delegations of students visited Mulungushi University in Zambia, the University of Dar-es-Salaam in Tanzania and the University of Sao Paulo in Brazil.

The visit to Mulungushi University took place from 22 to 28 October 2017 and saw eight Unisa students participating, visiting academic and research units, and national institutions supporting research and innovation.





The trip to the University of Dar-es-Salaam took place in parallel and involved eight other Unisa students who, in addition to viewing the university's academic and research facilities, visited the national department of science and technology and a national incubator where they met seven innovators, including the East African Innovator of the Year.

The visit to Brazil took place from 19 to 25 November and comprised six students, five of whom had won Innovation Challenge funding for their projects. The students visited various incubators inside and outside the University of Sao Paulo, as well as external entrepreneurship centres.

Conclusion

Although progress in intensifying the university's commercialisation momentum was constrained by internal capacity limitations in 2017, awareness levels of the importance of encouraging IP development and protection have grown across Unisa and its eight colleges, both among students and staff.

The DITT will be building on this foundation in the years to come, focusing strongly on assisting researchers to apply innovative problem-solving techniques to research problems, increasing the number of high-quality innovative research projects and nurturing the next generation of researchers.

PROFESSIONAL RESEARCH GROUP

Unisa continues to actively invest in and encourage the research interests of its permanent specialist/support professional employees, who are referred to as the Professional Research Group (PRG).

All permanent specialist/support professional members of staff at Unisa automatically become PRG members, giving them access to benefits that include research funding.

This can be used to complete a master's or doctoral degree, attend national or international conferences to present research papers based on the PRG member's studies and assistance in preparing research publications. PRG researchers also have access to research and development leave.

All PRG research contributions to the research agenda of the university are administered thorough an executive committee known as the Professional Research Committee (PRC), which also assists PRG members to further their research careers.

Since 2015, four members of the PRG have obtained NRF ratings. Through PRC, support has been provided to 19 master's and doctoral candidates, while 19 applications for research and development leave were recommended to the Executive Committee of Senate and 14 PRG members received research grants

ENABLING RESEARCH





COLLEGE OF GRADUATE STUDIES

The College of Graduate Studies (CGS) continues to play a pivotal role in supporting Unisa's efforts to increase the number of master's and doctoral graduates, train high-calibre researchers, promote interdisciplinarity in research and encourage research in open and distance learning and e-learning.

Some of the college's biggest successes in 2017 were its achievements in securing external grants – an increasingly challenging endeavour in fundingconstrained South African academia – and in generating ODeL research, with outputs in this area exceeding the target set.

In 2017, four CGS researchers received external awards or other forms of recognition and four researchers belonged to the Academy of Science of South Africa. The college has 19 NRF-rated researchers of whom four are B-rated, 14- C rated and one Y- rated. One researcher attained a first-time rating in 2017.

A significant challenge, however, was capacity constraints as a result of the decrease in researcher numbers from 33 to 30. This accounted for the college's research output total for 2017 coming in 10% below the target for output points. Even so, the college's per capita research rate was above the institutional target.

Publications

Of the 30 permanent researchers, 17 generated accredited research publications.

Most appeared in journals but a number of important books were published and chapters contributed to scholarly works. Although the college places greater emphasis on the publication of articles in accredited generals, several papers were presented at conferences and included in peer-reviewed proceedings.

The CGS had a total of 113 research publications, which

translates to 67.96 research output points against the target of 70. Nine ODL research output units were published, exceeding the target of eight. There was an increase in the number of publications in IBSS or ISI journals.

Funding

A total of 14 researchers received college funding totalling R704 817 in 2017, and 15 received NRF awards amounting to R700 000.

Four researchers received funding support totalling R540 000 from Unisa research support programmes.

In addition, funding to the value of R17,157 million was secured from external funding sources, including the NRF, SA Medical Research Council (SAMRC), the NRF S&F Scarce Skills Fund, the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and the Thabo Mbeki Foundation, among others. External grant funding was substantially higher than in 2016 and was above the 2017 target.



Doctoral and Postdoctoral Summer School

Held at Unisa's Science Campus from 6 to 10 November, the Summer School is intended for postgraduate students and emerging researchers.

This was the fifth Summer School to date and focused on issues such as men in ex-colonies, social protest and violence, drosophila as a model organism in drug discovery and development, new and emerging water treatment technologies and sustainable energy. The Summer School faculty consisted of 16 national and international invited distinguished scholars and 98 postgraduate students participated in the school.

Postdoctoral fellows and visiting researchers

Eight postdoctoral fellows were attached to the CGS in 2017 and collectively published seven journal articles and one conference paper, had three journal articles accepted and submitted five articles and a book chapter for publication or peer review.

The college had one visiting researcher, whose appointment ended in June 2017, and successfully applied to host two visiting researchers in 2018. The visiting researcher for 2017 submitted two papers to accredited journals and made presentations at two conferences.

Awards and recognition

Four researchers from the college received external awards or recognition in 2017.

Professor Malik Maaza, holder of the UNESCO Africa Chair in Nanosciences and Nanotechnology, received the African Union Continental Nkwame Nkrumah Continental Award, and Professor Ashley van Niekerk of the Institute for Social and Health Sciences/ Medical Research Council, received the Silver Scientific Achievement Award for Excellence in Research. Professor LL Leeuw was the keynote speaker at the Sasol University Research Seminar and Professor Kopano Ratele was the convenor of the NRF Specialist Committee for the Psychology Rating Panel.

Ethiopia Unisa Centre

Two staff members attained their doctoral and master's degrees respectively and four presented papers at the ICDE conference in Canada.

In December 2017, a graduation celebration was hosted in Addis Ababa, celebrating the success of 51 doctoral students and attended by the Chairperson of Council and the Vice-Chancellor, among others.

The annual graduate student research development and training programme was successfully presented, primarily targeting students who are newly registered for their PhD degrees and are thus in the proposal phase of their PhD studies. The goal is to lead them to successful completion of the research proposal within their first year of registration at Unisa.





RESEARCH INTEGRITY OFFICE

It was a good year for research integrity initiatives at Unisa, especially in the spheres of strategy, training and capacity building, supporting the university's research ethics committees and continuing to play an active role in the national and international research integrity fraternity.



Research ethics strategy

In 2017, the Unisa Research Ethics Review Committee (URERC) held a half-day workshop to refine the university's research ethics strategy.

The URERC members identified gaps in the strategy with regard to the optimal operationalisation of research ethics, identified what needed to be done to address the gaps and set targets and timeframes for the accomplishments of new tasks.

Research ethics training

During the year under review, the Research Integrity Office (RIO) took 488 Unisa researchers through various levels of research ethics training, well above the target of 200 set for the year in the annual performance plan.

Going further, the RIO also trained 105 academic researchers from other universities on request.

The total research ethics training target for the five years from 2016 to 2020 is 1 000 permanent academics. By the end of 2017, the second year, 813 Unisa academics had already received research ethics training, putting the total target well within reach.

Registration of college's committee

In 2017, Unisa increased its compliance with the National Health Act when the College of Human Sciences Research Ethics Review Committee (CRERC) was registered with the National Health Research Ethics Council (NHREC).

This is the third registered committee at Unisa, thus, giving researchers doing health research greater access to registered ERCs.

Research ethics committees audited

Unisa's Internal Audit Department audited the URERC and the CRERCs for quality in 2017.

The key performance areas under assessment were compliance with the National Health Act, NHREC and Unisa Policy on Research Ethics, and the organisation and training of CRERC/RERC members. A few gaps were identified where improvement is needed to strengthen the efficiency of research ethics operationalisation across the university. For the most part, the audit was positive and some CRERCs performed extremely well in terms of the assessment areas.

RESEARCH INTEGRITY OFFICE (CONTINUED)

Academic Integrity Policy

The Senate Research, Innovation, Postgraduate studies and Commercialisation Committee (SRIPCC) approved Unisa's Academic Integrity Policy in 2017.

Noteworthy activities and initiatives of the year were:

- The Unisa Research Ethics Review Committee and the college committees received 1 860 applications for ethics clearance from Unisa postgraduate students and academic and professional researchers.
- Terms of reference for URERC were approved, in compliance with national requirements, and a Code of Conduct was approved for members of all research ethics committees.
- The application forms for ethics clearance were simplified and a new reporting template was introduced for college committees to standardise and improve reporting.

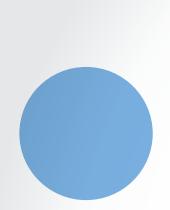
Conclusion

While there is much work to be done before Unisa can claim to have embedded a sustainable culture of research integrity among all researchers and students, solid foundations are in place for continued progress.

In the coming year, Unisa and the Research Integrity Office, which is an organising member of the Sixth International Conference on Ethics Education, look forward to hosting this important event in conjunction with Tshwane University of Technology, the Research Ethics Committee Association of Southern Africa (REASA) and Globethics.net.

STUDENTS

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STUDENTS

INTRODUCTION

Unisa is cognisant of the fact that research, probably more than any other activity, provides a plethora of benefits to students who want to position themselves for an outstanding career and/or successful path leading to postgraduate excellence.

To this end the university provides access to a number of exciting initiatives aimed at fostering a lifelong love of research, and also at equipping students with the experience and tools necessary to become researchers of note. We report on FameLab and a project aimed squarely at improving lives in real terms. Since the proof of the research pudding lies in its taste to external research organisations, a number of student accolades are also listed.

Conducting research can be a daunting experience if there is insufficient guidance during the process.

Knowing this, the College of Graduate Studies held research training workshops for master's and doctoral students throughout 2017. Students registered for honours degrees were also welcome to attend.

The workshops were tailored to the Unisa context of research processes, resources and technologies. Topics include writing a good dissertation, the philosophy of science and theoretical frameworks, research proposal writing, conceptualising a research topic and advanced statistics, among others.

While most of these workshops were held in South Africa, three were presented at Unisa's Ethiopia Centre for Graduate Studies in Addis Ababa. Altogether 150 Unisa postgraduate students attended the first Ethiopian workshop, held from 16 to 20 April 2017. Of these students, 120 were master's or doctoral candidates in the proposal-writing stage, and 30 were writing their theses or dissertations.

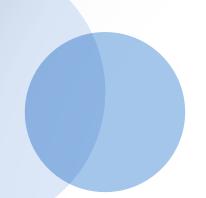
PUTTING A STOP TO RESEARCH WRITER'S BLOCK



Postgraduate students attending the research training workshop in Ethiopia.

STUDENTS





STUDENTS MAKE EVERY SECOND OF THREE MINUTES OF FAME COUNT

When the clock is ticking and you have only three minutes to impress the judges with your research, there's no time to waste.

Students in the Gauteng regional heat of Famelab 2017, an international science communication competition, made every second count, using their time to speak up on subjects

such as how to cure stomach acidity, the use of mobile apps in farming and the disposal of human waste in rural areas, to name a few.

The regional heat, held at Unisa as part of the university's Research & Innovation Week in March, saw 16 students competing in the first round. The judges then chose the 10 best speakers to compete in the second round, after which two winners were chosen.

They were Fulupelo Mudau, a PhD student of nanotechnology at Unisa's Science Campus, and Darryl Herron, a PhD student in plant pathology at the University of Pretoria's microbiology department.

Mudau's Famelab topic was the use of membrane technology for purifying polluted or contaminated water, and Herron spoke about a deadly fungus that had been killing pine trees across South Africa.

In South Africa, FameLab is a collaboration between Jive Media, a leading science communication agency, the South African Agency for Science and Technology Advancement (SAASTA) and the British Council in South Africa. Unisa regularly hosts the Gauteng regional heat of the FameLab competition.

Famelab participants





SCIENCE STUDENTS USE KNOW-HOW TO HELP UNEMPLOYED WOMEN MAKE AND SELL SOAP

Take five enthusiastic young students from Unisa's College of Science, Engineering and Technology; add a pinch of inspiration and a strong desire to help unemployed women generate an income – and the result is a sellable product which can be cheaply made from everyday ingredients found around the home – soap!

Katlego Semenya, who is busy with her BTech, says it all started with her love of soap and the need to do something with all the oil distilled from plants as part of her studies. After researching soap recipes, she knocked on the doors of Professor Diane Hildebrandt and Ralph Muvhiiwa of Unisa's Material and Process Synthesis Research Unit (MaPS), who agreed to supervise the project.

Semenya was soon joined by Thembelihle Ndlela and fellow teammates from Engineers without Borders as

they took on the project in all earnest. Once the recipe had been fine-tuned, and endorsed by a local councillor, it was introduced to a group of women from the Inanda community in Durban.

The three-day workshop provided the women with hands-on skills and included community upliftment, the soap-making process and precautions, how to distil oil from plants for scent, entrepreneurship and mentoring.

The same group of students is also involved in another community project, this time around the development of mobile labs so that learners in community schools have a chance to do science experiments with typical laboratory equipment.



Katlego Semenya, Kamogelo Sehoole, Zamanyambose Mthethwa, and Saneliswa Magagula



Paul Sambo (left) accepting his award

ACCOLADES

PhD student wins gold at ICT4D conference

Paul Sambo, Unisa PhD student in Information Systems in the School of Computing, has won gold for his paper at the International Conference on Information and Communication Technology for African Development (ICT4AD) in Douala, Cameroon, in May 2017. Sambo presented a paper that he co-authored with his supervisor, titled Quality of experience: A case study of the Namibian eVoting System. This was a case study of the behavioural issues affecting its implementation in Namibia and South Africa, supervised by Emeritus Professor Patricia (Trish) Alexander.



Young scientists attend BRICS Forum

Ten young South African scientists and three senior researchers were nominated by the Academy of Science of South Africa (ASSAf) to attend the second BRICS Young Scientist Forum in Hang Zhou, China, in July 2017. One of them was Dr Luyanda Noto, postdoctoral Fellow in Unisa's Department of Physics.



Luyanda Noto standing next to a display at the Chinese Cave Library

Reach youth through their language

Napjadi Eugene Letsoalo received the annual young linguist award for the best conference paper in linguistics by a first-time presenter at the 2017 Conference of the Language Associations of Southern Africa.

Letsoalo is enrolled for a PhD in Linguistics that looks at the syntax of Sepedi. He conducts research that focuses on the development of South Africa's indigenous languages.

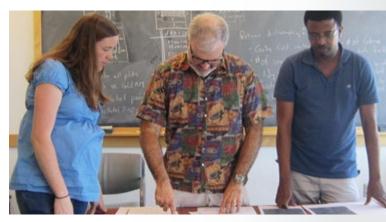


Eugene Letsoalo

Astronomy student participates in a "Cosmic Dawn" research project in the US

Kifle Hailemariam Mekuanint, a Unisa PhD student supervised by Professor Lerothodi Leeuw of the College of Graduate Studies (CGS), participated in the CAMPARE-HERA Astronomy Minority Partnership (CHAMP) programme, held in the United States from 10 June to 27 August 2017.

Funded by the United States National Science Foundation, the CAMP programme seeks to study cosmology and radio astronomy and hone participants' expertise in these fields.



Kifle Hailemariam Mekuanint (right) discussing research results with Bryna Hazelton and Dr Miguel Morales, both from the Department of Physics at the University of Washington.





Define tomorrow