YOUNISA

Celebrating Technology

Define tomorrow.

UNISA | university of south africa

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Editorial

Changing times

Not every issue of YOUNISA sports a special cover wrap, but we thought a special event such as the inauguration of former President Thabo Mbeki as Unisa's new Chancellor had to be shared with our readers in a special way.

In their respective capacities, Unisa and Dr Mbeki have been driving the advancement of the continent and its people. The inauguration of the new Chancellor is therefore more than a ceremonial occasion - it marks the joining of hands to realise the vision of an African Renaissance.

This issue of YOUNISA also celebrates technology. Without much fuss or noise, technology has seeped into every aspect of our lives and today we are surrounded by the most astonishing gadgets. Computers, cellphones, microwaves, hairdryers and even something as simple as the springs in your mattress are examples of technology. Life without it has become unimaginable.

Technology has changed education dramatically. Notably since the introduction of the internet, access to education has increased exponentially. Technology has also changed the face of distance education and has spurred Unisa's transformation from a correspondence university to an open distance learning institution using a range of online technologies to deliver educational content.

Technology, however, is a two-edged sword. It has created a new world, a digital one, and astounding scientific and medical advances have been made. Unfortunately there is also a downside to the impact technology has on society. Glued to devices such as tablets and cellphones, our youth in particular are less active and often physically isolated. Cellphone addiction has become a real problem and yesterday's school playground bullying has turned into cyberbullying. In this issue of YOUNISA, technology is in the spotlight and we invite you to read about how it is shaping our teaching and learning, and how our students, alumni and researchers engage with it in many diverse ways.

> " Technology has changed education dramatically. Notably since the introduction of the internet, access to education has increased exponentially.

Letterbox

We look forward to your thoughts on the articles published in this issue and any other news or information you would like to share with your fellow students and alumni. We would be interested to hear your views on higher education and especially on the call for "decolonised higher education" as this will be the theme of our next issue of YOUNISA. What does decolonised education mean? Weigh in on the conversation by sending an email to younisa@unisa.ac.za, or post a letter to the following address:

YOUNISA, Department of Communication and Marketing, PO Box 392, Unisa, 0003.

Please note that the editorial team reserves the right to edit and shorten articles if appropriate.

Skills for the future.
Are scientists ready?

Our world is constantly changing. We can longer do things the way we did them ten years ago, or even a year ago. We need to change from operating along conventional lines to adopting a more modern set of tools to address 21st-century challenges.

Traditionally, scientists are problem solvers. They conduct literature searches and do laboratory experiments, then report their findings in writing or orally, at conferences. And that's that. Often vital information only circulates within that small, select community.

Perhaps scientists require a new skill: the ability to communicate creatively. The world needs scientists who can do applied research that speaks to the problems facing humanity right now, but can also act as role models to motivate the youth.

Scientists need to find more exciting and simpler ways of presenting complex scientific concepts. When communicating to Joe Public it is important to think 'mmm': keep the message meaningful, memorable and miniature.

Creative communication can be broadened by communicating scientific concepts in vernacular languages. Remember the recent cyclone that hit Mozambique and parts of South Africa? The name "Dineo" got everyone talking. Linking a meteorological phenomenon to a household name captured the imagination and stimulated public interest.

The world needs scientists who can do applied research that speaks to the problems facing humanity right now, but can also act as role models to motivate the youth.

> The world needs scientists to leave their labs and dedicate time to community engagement, as that will change perceptions of what science, engineering and technology entail.

But there are challenges. First, it will require a changed mindset. Yes, many scientists are reserved individuals who prefer to work in isolation. Some fear that if they reveal too much, someone else will copy their ideas. Competition is tough and some want all the accolades, so they go it alone. Communicating about science in our indigenous languages would be preferable, but barriers still exist: so rapid is the speed of change that particular scientific terms do not yet have vernacular equivalents.

Are our scientists ready to face the future? Unisa's dedicated staff and students are already using science communication platforms such as Famelab. Applied research is a reality, but more scientists need to actively engage with the public about their ground-breaking work.

> **Nozipho Gumbi**

(The letter has been shortened - the complete version is available on myUnisa on the Unisa website. Ed.)

Giving to Unisa made easy

Thank you for sending me a copy of YOUNISA. The magazine is very informative and well written.

I really like its feel and touch, and the layout is superb. Articles that captured my attention were *Unisa's leadership tackles the fees challenge head-on and How to give to Unisa online*. Technology makes giving (back) to Unisa very easy.

I will appreciate if I can continue to receive the magazine in future.

> **Dipuo Masango**

"Retail segregation" in South Africa

With more than two thousand shopping centres, South Africa is one of the top ten countries in the world with international retail stores. In spite of the unemployment rate, the people of this country love to frequent shopping centres.

The words "United we shall stand" can be drawn from our national anthem, but the geographical arrangement of our retail stores appears to reflect features of systemic divisions.

> Township dwellers are also entitled to their share of good service and quality goods.

The word "segregation" might sound incongruent in the context, but the application of it is necessary to demonstrate just how the segregation of our society manifests itself in shopping centres in townships and suburbs of South Africa.

In a country with the majority being blacks, mostly living in villages and townships, it is quite alarming that big restaurants such as McDonald's are located in the suburban areas. Retail stores such as Game, Woolworths, Makro and many others, restaurant chains such as Spur, Ocean Basket and Steers are not to be found in townships. Why? The answer lies in the fact that we are still systemically divided.

Retail segregation suggests that businesses believe that those who live in townships only need Shoprite, Cambridge Food and KFC, which are common in townships. It is also surprising to see that even in poor white communities, one need not travel many kilometres to reach a nice coffee shop or a McDonald's restaurant. So, is big business deliberately dividing us? The answer is, yes!

With racism persisting and even increasing, the rich are fast becoming impatient with the influx of rural and township people in their comfortable space. Township dwellers are also entitled to their share of good service and quality goods. But, to get that they are compelled to shop in the suburb malls.

Big business must be cautious because their actions have an impact on the lives of the people. Their absence in townships and villages can be interpreted as discrimination against vast numbers of our population. This provokes anger and dissatisfaction among village and township people. Instead, businesses should look at the benefits of opening more shops and malls in townships and villages. Apart from economic benefits they will satisfy the needs of people who often have to travel long distances to the shops and malls located in the suburbs.

>Thabo Makwakwa

In our Wordwise feature we explore words commonly used by students, alumni and academics every day, but of which the origins are often lost in the mists of time.

The term technology, a combination of the Greek technē, "art, craft," with logos, "word, speech," meant in Greece a discourse on the arts, both fine and applied. When it first appeared in English in the 17th century, it was used to mean a discussion of the applied arts only, and gradually these "arts" themselves came to be the object of the designation.

By the early 20th century, the term embraced a growing range of means, processes, and ideas in addition to tools and machines. By mid-century, technology was defined by such phrases as "the means or activity by which man seeks to change or manipulate his environment."

(Source: Encyclopaedia Britannica)

Unisa students dig the *digital age*

More and more Unisa students, of all ages, are benefiting from this awesome thing called technology. It's not uncommon for today's trends to be outdated tomorrow. However, this doesn't stop our students from evolving with technology.

Gaming, online shopping, online classrooms, social media, out-of-this-world phones, other gadgets and a gazillion apps (and counting) make the digital age more overwhelming than ever. We chatted to a few Unisa students who share their love for the digital age and some of their favourite aspects of technology today.

Rajiv Kamal – (College of Business and Management Sciences): "From a very young age I was fascinated by technology. I wanted to know how computers and other devices worked and how to dismantle them and then put them back together. I believe that my early exposure is what enabled me to be quite tech-savvy. I still enjoy reading about new trends in technology and playing with the latest devices available. Of course, gaming is a big part of that too. The budget for some blockbuster video games is more than some of Hollywood's biggest movies. I enjoy them because, like books, they immerse you in rich and vibrant worlds. Except, that with gaming, you're the main character and in control of how the story plays out."

Shemane Mosaka – (College of Business and Management Sciences): "Technology is a fun and easy way of learning, it reduces the frustrations of having to submit written assignments the 'old fashioned' way and this also saves time and energy. This is also a two-way street for lecturers and Unisa students to communicate in an efficient, practical and comfortable way. In my opinion, the learning experience is now more convenient, because of technology, as Unisa offers e-tutoring lessons online. The added benefit is that students get a chance to get to know each other and assist and guide one another. We no longer have to worry about getting access to study material as the myUnisa online server allows us to download the necessary study material – as long as we have our student number or e-mail. As students, we also have access to Unisa's WiFi, which means that we can do research and study at ease. I enjoy the fact that technology is constantly updated and access is at our fingertips."

Caitlin Sarah Watson – (College of Education): "I work as a delivery person, on a bicycle (a wonderful job, as you get paid to exercise, explore your surroundings and meet so many interesting people), and while waiting for new deliveries, I do my prescribed reading on my cellphone. I have the VitalBooks Bookshelf app on my phone and it syncs seamlessly with my desktop Bookshelf. So, whenever I open my e-textbook on a new device, it's exactly where I stopped reading the last time. Without my cellphone, I'd really be battling to keep up with the reading!"

Ashley Ashizo – (College of Science, Engineering and Technology): "Personally, technology has allowed me to redefine very fundamental parts of my social makeup. How I think, how I connect with everyone, how I purchase and consume products, all of these areas of my society is rapidly changing, because of technology.

In many ways, technology has enabled us to strengthen relationships by making it possible to keep in contact with old friends, colleagues and co-workers. What would we do if we could not find old friends from high school through Facebook? Technology has even provided opportunities for students all over the world to receive an education online, while still maintaining work schedules and family. Students are now able to take webinar courses and attain their degrees online, just as any student on campus. Isn't that awesome!?

With technology playing a significant role in my life, as a student, parent and employee, sometimes I find it rather difficult to engage in a conversation with friends without the use of technology. My friends and I find excitement in watching YouTube videos and listening to music, which then leads to conversation. I have yet to see people engage in conversations the "old fashion" way, without phones, tablets or computers, and that is something that I would like to see more of. I am challenging myself to power my phone off when I am at dinner or hanging out with friends.

Technology is now so integrated with our lives that going without it can cause severe anxiety for some. It's not hard to see why. Technology has taken over.

Both our professional and personal lives are now technology dependent. We are no longer paying postage to send out birthday cards. An e-card, text or e-mail has that covered. Online dating has been around for a while and many people are using Google to find out if their date is a dud. We are no longer using the traditional route of sharing information. Social networks now allow us to share pretty much anything, anywhere, anytime. We no longer need to carry books, if we don't want to. Smartphones, tablets and e-readers have made it easier for us to carry our books around without breaking our backs."

Sontaga Frank Matloga – (College of Education) "Technology has completely changed our lives. Today we have smartphones with which you can do almost everything. You can search for information on Google, Bing and other search engines, or you can also use your phone to give you directions. I can hardly imagine that a few years ago I only used my phone to make calls and play a few games. Back then computers were also mainly used for sending emails and typing documents using Microsoft Word, whereas today you can do a whole lot more with your computer. Frankly speaking, I can't imagine my life without technology. I certainly don't want to swop places when listening to people recalling what it was like living in the 40s and 50s without today's technology available and left to their own devices!"

Learning turns into *e-learning*

The technology tsunami has changed almost every aspect of our day-to-day lives. We bank, shop and even date online. Greeting cards have made way for e-cards, text or email messages, and, courtesy of e-readers, smartphones or tablets, an entire library can now easily fit into our pockets. This wave of technological advances has also swept across the education landscape: yesterday's pen and notebook have made way for tablets and smartphones.

The Head of Unisa's Institute for Open and Distance Learning (IODL), **Professor Mpine Makoe**, explains how technology has advanced education and, in particular, higher education.

The unprecedented growth of technologies in the past two decades has transformed the way education is viewed. The use of digital technologies in teaching and learning has been seen as a way of delivering information faster, better and more cheaply than any other kind of tool that has been used in education before. The integration of Information and Communication Technology (ICT) tools in the education system – even in places with limited resources – has had a major impact on the way we teach and learn.

Ours is a knowledge-based economy where ICT skills are not only crucial for securing jobs in the 21st century, but also for boosting the socio-economic development of the country. The growing need for highly skilled, qualified workers demands that tertiary institutions carefully consider what capabilities will be required of the workforce of the future. Only by offering the relevant academic and skills training can developing African countries enhance their productivity and remain globally competitive.

The rationale for integrating technology in education is rooted in the need to open up access to education to an ever-increasing number of learners. The use of technologies in education cannot, however, replace all the current delivery systems. ICTs function optimally when supporting and enhancing print-based instruction, be it through distance education or the face-to-face instruction delivered at contact institutions. The integration of ICTs should be carefully considered: if used properly, such tools can facilitate collaboration amongst distance students, deliver content cheaper and faster, supplement print-based study material and potentially produce tech-savvy graduates who are adept at using new technologies in the workplace.

For many years, technology in education was deemed the purview of open and distance education delivery methods. In fact, technology has been a defining factor in every iteration of distance education: the first generation exploited the use of postal services to

deliver study material via a correspondence model, which mainly relied on print-based materials. In use for over a century, it was only in the early seventies that other models were gradually introduced. The second generation introduced multimedia such as radio and television as platforms for teaching. The introduction of ICT tools paved the way for future advances, so that in the third generation, interaction was facilitated through audio, video or computer conferencing and/or face-to-face meetings. Web 2.0 technologies, which represent the fourth generation, introduced a flexible learning model which relies on online delivery via the internet. The fifth generation exploits features of the internet and the web to enhance interactivity between students and their lecturers. These diverse models provide evidence that ODL institutions have, over the years, experimented with different technologies in their teaching and learning. The main concern, however, has always been to focus on how best to remove the "distance" from distance education, or at least to make it negligible.

These diverse models provide evidence that ODL institutions have, over the years, experimented with different technologies in their teaching and learning. The main concern, however, has always been to focus on how best to remove the "distance" from distance education, or at least to make it negligible. To this end, the University of South Africa (Unisa) employs technology in different formats to enhance and support learning in a distance education environment, but that does not make it an e-learning or an online university. Many policy makers – especially in countries that do not have the proud history of distance education that we do – tend to

"Distance education" is misunderstood as online, e-learning and, most recently, blended learning. In fact, distance education involves a delivery system that uses a variety of technologies and instructional systems to provide education to students who are physically separated from their lecturers and the institution.

view e-learning as a subset of distance education, where the delivery of study material is only achieved through web-enabled tools.

For many years, Unisa used mainly print-based study material and other technologies such as audio, video and radio as platforms for teaching and learning. In an effort to facilitate the implementation of ODL practices, policy was developed to clarify the rationale, systems and structures needed to support distance education. In 2008, Unisa's ODL policy was developed in response to recommendations made by the ODL project team (2006–2007) and, since then, the institution's practices have changed dramatically: from a purely correspondence-based approach to the digitally supported provision of teaching and learning. In recent years, Unisa has added computers, internet and cell phones to its service offering.

Nations across this continent acknowledge the vital role of ICTs in education, and the use of ODL in disseminating knowledge to large numbers of people. They believe these advances will enable their respective countries to realise Vision 2030, as outlined in the United Nations Sustainable Development Goal 4: Towards an inclusive and equitable quality education and lifelong learning. Although many government departments appreciate the role of ODL and ICT tools in expanding access, an inadequate understanding prevails of what distance education truly entails. ODL is not only important in providing cost-effective access to education in an environment constrained by limited resources, it also enables the mass enrolment of students at reduced cost.

Despite the promise and obvious advantages of technology-enhanced distance education, a number of challenges still need to be resolved. Many African countries have limited access to electricity and telephone networks; ICT infrastructure is lacking and internet connectivity is weak; roads and postal services are inadequate; and in many instances computer skills are rudimentary. In addition, many who are expected to take the lead in implementing these technologies lack the knowledge, technical ability and pedagogical skill to use these tools effectively in an educational context. Further, there is growing concern about what these possibilities mean for communities which are socially excluded from, or deprived of, access. Although the real limitations should not be ignored, it is just as important not to underestimate how crucial ICT tools are for education.

Developing nations face the same global market competition as developed economies. The success of ICT integration in education and ODL provision depends on how the necessary policies, systems and structures are put in place to support teaching and learning across space, time and distance. National policies need to be developed to outline strategic goals, and adequate technological infrastructure must be created to implement and support ICTs. The costs of software, hardware, connectivity, technical support and professional training for lecturers and administrators need to be considered and managed properly. After all, it is not the technology that transforms education, but the way in which that technology is used and administered as an instructional tool, that will make a real difference in educational terms.

From the
chalkboard
to the *tablet*
and *beyond*

Gone are the days when a chalkboard comes to mind when education is mentioned. Today, it is more likely that education is associated with tablets and smartphones, WiFi and the internet. The evolution of teaching and learning is closely linked to, and often prompted by, the introduction of new technologies. This transition is also apparent in how Unisa has changed over the years. Unisa started out as a correspondence university and, as new technologies became available, teaching and learning at Unisa inevitably had to change and adapt and the university has, therefore, transformed into an open distance e-learning university.

Over time, Unisa had to introduce new technologies to enhance its teaching and learning and the milestones in this journey include the following journey are depicted on the next page.

1947

The first correspondence programme started on 01 March 1947, when the first postal tuition package was ceremoniously sealed and mailed to one APJ Heiberg, in Boksburg.

1963

Audio cassettes were sent to students to supplement their study guides.

1970

In the seventies, there was an increase in the use of radio and audio and video cassettes as Unisa embraced technologies to bridge the distance between the university and its students.

1993

Unisa started using two-way audio visual video-conferencing as a teaching and communication medium.

2003

Study material in Braille was made available for the visually impaired.

2007

An integrated online learning management platform, myUnisa, and open distance learning initiatives were launched.

2008

"Toasters" were introduced at student centres across the country to provide students with course-related materials via USB, CD and DVD.

2013

Six signature courses were introduced to the curriculum. These are fully online modules, distributed on a digiband – a wristband USB flash drive. These courses are designed to engage students in an interactive way in order to ensure an enriching learning experience.

2017

Today, lively discussion forums are hosted on myUnisa, giving students the opportunity to interact, connect and create their own study groups and engage with their lecturers.

The arrival of the World Wide Web (WWW), combined with the internet boom in the late 1990s and the explosion of social media, has seen teaching and learning taking on a whole new character. The availability of interactive and engaging study materials has transformed learning. Today, students are taken on a journey of exploration and they are able to share the knowledge they have acquired through various media. Platforms such as Wikis and discussion forums, Facebook, Twitter, LinkedIn and YouTube are the engaging communication channels through which students share ideas, find other Unisa students, ask questions and generally stay informed. Through the use of Google Hangouts and Skype, students are able to organise themselves into pairs or groups to continue with conversations regarding their course work.
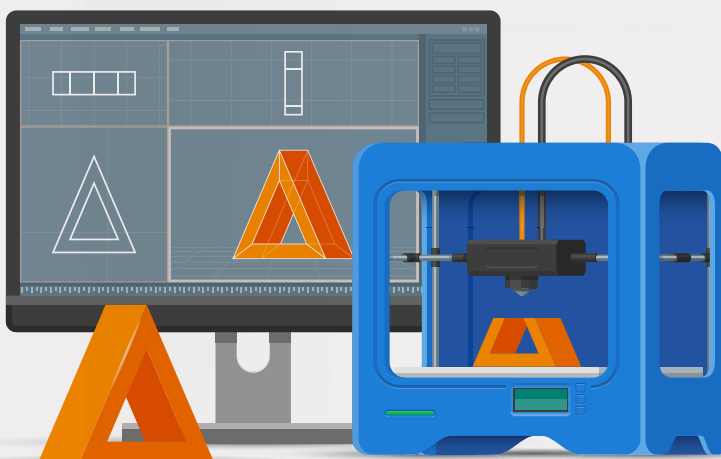
The internet-based Unisa Radio is yet another vibrant and informative communication platform that provides information and discusses topics focused on students. Its programming consists of music, interviews and talk shows.

As for the future of education, the only thing we know for sure is that it will change. Game-based learning, adaptive computer-based assessment, 3-D printing and wearable technology are but some of the trends already on our doorstep.

A day in the life of ...

The Directorate for Innovation and Technology Transfer

Innovation is at the heart and click of everything Unisa's Directorate for Innovation and Technology Transfer (DITT) does. The Directorate plays a pivotal role in facilitating the identification, evaluation and protection of Intellectual Property (IP) emanating from Unisa's research and development activities. Equally, the DITT is responsible for supporting innovation through various programmes, as well as facilitating student exchange programmes and organising the annual Unisa Student Research and Innovation Showcase. This is just a little screenshot. If you are keen to know more about this team and the work that they do, then take a walk with YOUNISA and see what a day in the life of the DITT looks like.

Meet the team

The dynamic DITT team is made up of Hazel Mathye, (technology transfer officer), Nonkululeko Shongwe (innovation support officer), Hlumela Kunene, (administrative officer), Ntanganedzeni Muanalo (innovation support project manager), Ayanda Noma (director), Lunathi Hontoti (administrative officer), Sipho Dikweni (CHUMA commercialisation intern), Thembela Ntlemeza (technology transfer support officer) and Priscilla Ngobeni (administrative assistant/PA).

07:00

Innovation support project manager, Ntanganedzeni Muanalo, arrives at work, checks her calendar for new meeting requests and then starts working on all the documents that require her input (such as memos and other working project documents). She also spends time on reading, drafting and vetting agreements.

08:00

The rest of the team arrive at work, greet each other and often informally engage with work projects and a variety of other topics ranging from developments in technology to sport. Director Ayanda Noma quickly checks his diary, responds to e-mails and attends to administrative tasks such as approving requests for orders for patent applications and prosecutions, signing invoices, Unisa Press approvals, and other documents that need his consideration and approval. He discusses with individual team members their progress on various projects.

10:00

Muanalo gives a patent search presentation to colleagues and demonstrates a practical example; this is part of capacity building initiatives for internal DITT staff. When the DITT receives an IP disclosure, they undertake an evaluation of the technology contained in it. Part of the evaluation involves an assessment of whether the technology can be protected and what form of protection is appropriate for that technology disclosed. This entails undertaking a search of available information, including patent databases, to check if the same technology exists and is protected by another party. The searching of databases is a skill that they are currently developing within the DITT to ensure that most of these searches are done in-house rather than outsourced to third parties.

11:00

Noma attends a meeting with researchers regarding a technology disclosure. Researchers and students routinely make appointments with the DITT to disclose any technologies they may have created as part of their research or studies at Unisa. The DITT assists them with the assessment of the technology as well as its protection.

12:00

Hlumela, Noma, Nonkululeko, Muanalo and Lunathi discuss the annual Unisa Student Research and Innovation Showcase. This is a joint initiative of the Research and Innovation Portfolio and the National Student Representative Council (NSRC). One of the objectives is to create awareness among students of the importance of research and innovation as tools for socio-economic development and progress.

12:30

Sipho, Thembela and Hazel discuss a Floatation Device technology offering, which acts as an anchor and elevator for equipment, shacks, mobile houses and other items that would otherwise be affected by flooding when on the ground. For this technology, the team has a South African Patent Application (pending).

13:30

Unisa has a reciprocal exchange programme with the University of Mumbai and Noma discusses the Mumbai delegation's upcoming visit with the team. The winners of the oral presentations of the Unisa Student Showcase get to participate in this exchange programme.

15:00

Noma works with staff on videos and marketing materials in preparation for the upcoming Innovation Bridge. This is an initiative of the Department of Science and Technology where universities and science councils get to showcase their technologies to the private sector and government organisations. The DITT participated in the first event that took place in 2015.

16:00

The working day's hours have run out but Noma is still working on Southern African Research and Innovation Management Association (SARIMA) documentation in preparation for the conference later this year. He is an executive team member of SARIMA and on the conference organising committee responsible for putting together a programme for the Innovation Management stream.

TOP 10 TECHNOLOGY OFFERINGS

For Unisa's Directorate for Innovation and Technology Transfer (DITT), technology and innovation are not just words. These concepts are the very lifeblood that brings to the fore technology offerings ready to make a difference in South Africa. Developed by Unisa researchers, these technology offerings are available for licensing from the University. Here are just some of them:

01 Smart energy controller

This is a smart microprocessor and sensor-based controller that allows users to optimise energy efficiency in households. The smart microprocessor is connected to a distribution box and enables management of energy usage in the household. The controller monitors demand from the various lines in the distribution box and based on this, switches power on or off to non-critical lines in the distribution box, thus ensuring efficient utilisation of energy as well as cost savings for the households or office. The controller is powered by solar energy. The smart controller has many Benefits: convenience, a reduced power bill and reliable and intelligent control of energy.

02 System for managing storm water in vulnerable areas

This innovation relates to the introduction of a bioswales system to capture storm water and reduce flooding in vulnerable areas, particularly in informal settlements. With the lack of proper drainage systems in informal settlements, bioswales offer advantages of water collection and filtration of storm water, which will ultimately result in the reduction of environmental pollution. Bioswales will assist informal settlements to reduce the flooding caused by heavy rains as this affects both living conditions and mobility. Benefits: reduces total volume of storm water runoff and controls floods, is environmentally friendly, improves biodiversity, reduces waste and is aesthetically pleasing.

03 Durable and eco-friendly household roofing

This is an information portal that helps school-leaving secondary school learners to get easy and simplified access to information when applying for a bachelor degree at any South African university. It provides a platform where information related to a qualification such as entry requirements and tuition costs at SA universities are simplified, standardized and presented uniformly. This makes it easy for applicants to compare the universities' programme offerings and allows them to make an informed choice.

04 High-performance lithium-ion batteries

This is a novel sol-gel-based uniformly carbon coating process to produce high-performance lithium-ion batteries. The process uses carbon nanotubes and employs an improved carbon-coating process to optimise the performance of lithium-ion batteries. This method uses organic phosphoric acid as carbon and phosphoric sources to produce uniformly carbon-coated lithium-ion batteries that will overcome challenges of low-capacity and low-energy density which ultimately contribute to battery failure. Accordingly, these batteries can be used in applications that need a long lifecycle and significant safety. Benefits: high performance and increased capacity.

05 Waste beer recovery

This is a novel method of recovering beer from surplus yeast and adding it back into the brewing process. Recovered beer is separated from the surplus yeast via known filtration or centrifugation technologies and treated with UVC light to sterilise it prior to its addition back into the brewing process. Benefits: cost-effective beer production, reduced effluent, reduced carbon footprint for beer production, expanding such innovative technology into existing industries so as to conserve water and carbon dioxide.

06 The solar-powered urine treatment system

This uses nanomaterials to recover nutrients and water from urine. Environmentally friendly nanomaterials are synthesised and used to produce fertilisers (for food crops) and water (for irrigation) without using electricity. Ultimately, this will solve the problems of poor sanitation in rural areas by providing both an affordable and clean sanitary system with an on-site small-scale separation and treatment system that kills pathogens and extracts water and nutrients for reuse in irrigation in rural communities. Benefits: efficient system, affordable and environmentally friendly.

07 Automatic healthcare assistance device

This is a multi-functional healthcare assistance device to support people with visual, mobile and speech impairments. The device uses robotics, telemetry, sensors and voice-control features to provide a range of functional support to patients and the aging population, people with physical and mental disabilities and walking impairments. Benefits: single device that provides multi-functional healthcare assistance, fully automated healthcare device, convenient and efficient patient support.

08 Levelapp

This is an information portal that helps school-leaving secondary school learners to get easy and simplified access to information when applying for a bachelor degree at any South African university. It provides a platform where information related to a qualification such as entry requirements and tuition costs at SA universities is simplified, standardised and presented uniformly. This makes it easy for applicants to compare the universities' programme offerings and allows them to make an informed choice.

09 The floatation device

This acts as an anchor and elevator for equipment, shacks, mobile houses and other items that would otherwise be affected by flooding when on the ground. The device consists of interlocking structures made of plastic or similar material. In use, the interlocked structures would be placed under the item, and during flooding, the device elevates the item above the water and provides stability to secure items from damage or drifting away. The device is secured by short concrete poles that will prevent it from moving sideways. The structures can be arranged to form a walkway above flooded surfaces or swampy areas and are similarly secured with concrete posts to prevent sideways movement. Benefits: convenient and efficient patient support, valuables inside the shack are better protected from water, there are fewer flood victims in and around susceptible areas.

10 School centred emergency intervention kit

This kit provides an organised, rapid and effective response to medical emergencies in rural or remote areas where it may take hours before paramedic support reaches the site of emergency. The SCEIK is fitted with an emergency kit, a panic button for communication with trained personnel for a quick response time and a tracking device to ensure that the kit is monitored. The SCEIK programme also ensures that volunteers are trained to intervene on-site while waiting for the arrival of an ambulance during a medical emergency.

MAN MEETS MACHINE ... *MACHINE* READS MAN!

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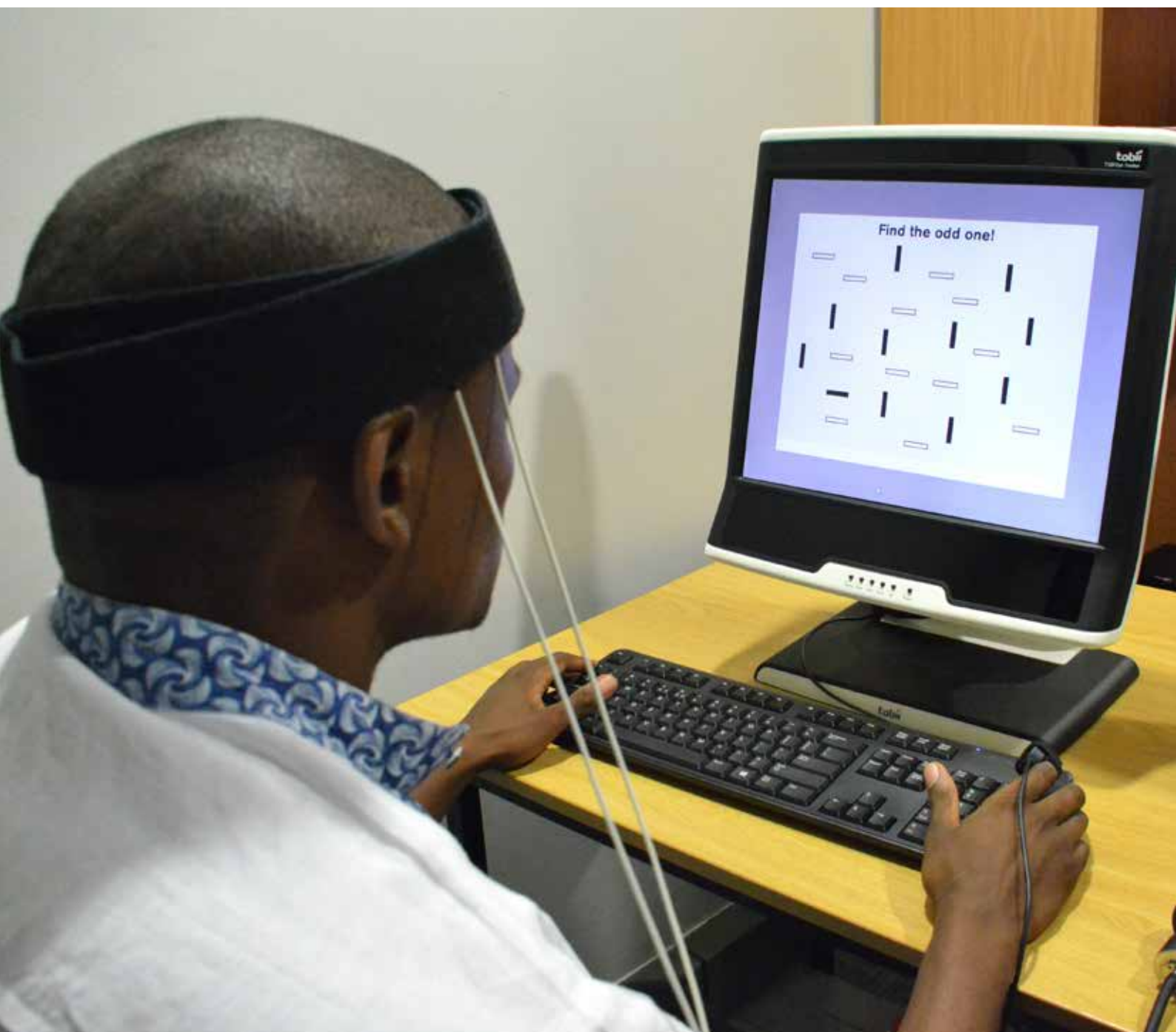
Unisa's School of Computing (SoC) has proven once again that it is at the cutting edge of technology and research by acquiring equipment which measures a wide range of physiological indicators.

Psychophysiology is an area of psychology that measures an individual's bodily responses to reveal something about their mental state and behaviour. By measuring markers such as brainwaves, galvanic skin response, skin temperature, reaction times and blood pressure, we can gain insight into a subject's psychological state. The data collected in this way is not only useful to researchers, but will also help to unlock and possibly circumvent any potential barriers and distractions facing learners who are preparing for or writing exams, for instance.

According to Professor Mac van der Merwe, the plan is to position SoC's Human-Computer Interface (HCI) laboratory as an epicentre of innovation. One particularly interesting application is to pair psychophysiological data with eye-tracking data. "User experience (UX) researchers are always looking to collect objective data, and eye tracking provides objective data based on participant behaviour. Eye-tracking measurements allow us to gain deeper insight into how users perform usability tasks. For example, are they having a hard time using the navigation menu of a website, or are they engaged with the content of a particular page?"

Students who merely scan online text often miss important information. The question is: Are they unmotivated or just bored? Is something wrong with way the information is structured? Will it help if we add more colour? Should we change the font size, or the line length? Van der Merwe's primary goal is to see Unisa become the first university to innovatively combine and apply eye tracking and psychophysiology to e-learning, to resolve these and other issues.

The data collected in this way will provide more usability information than ever before.

Van der Merwe explained that even the very young can benefit from this technology: "Taking the eye-tracking measurements of a child reading a mathematics test paper will tell us which part of the paper or question she is fixating on (for instance, a question may be poorly constructed or too difficult to comprehend), but it does not tell us if the child is experiencing stress while reading the question. This combination of measurements not only allows us to mimic and determine real-world experiences, but also to break through the subject's cognitive bias where, for example, they state that something was easy when they really struggled."

A more advanced application is in the area of physiological computing. Imagine if you could transform bioelectrical signals from your nervous system into real-time computer input, to enhance and enrich your interactive experience. The computer would automatically change the difficulty level of a computer game, based on input received without you even being aware of it!

Van der Merwe urged postgraduate students doing related research or projects to get involved by making use of the available instruments. Any Unisa departments interested in collaborative research, or wishing to make use of the equipment and facilities, are just as welcome to contact the HCI.

A section of the laboratory has since been set aside for research focusing on the applications of 3D scanning and printing, which opens up a whole new and exciting world of possibilities.

66 Technology is advancing so rapidly, Van der Merwe warned, we should not be surprised if the laptops of the not-too-distant future use a built-in camera to track our eye movement; or if the keyboard, joystick or mouse records our blood pressure or the amount of perspiration we leave behind when we interact with these devices.

Prof. Mac van der Merwe

Cyber security is important for our future

By Busisiwe Mahlangu

A leading cyber security scientist, Dr Jabu Mtsweni, who works for the Council for Scientific and Industrial Research (CSIR) as a Research Group Leader in cyber security, is charting the way forward to ensuring that young people and communities are able to adapt to innovation in science. Dr Mtsweni is also a senior researcher, technical developer and mentor.

Dr Jabu Mtsweni started his career, at the age of 22, as a teacher in Secunda, Mpumalanga, a profession he worked in for nine years before venturing into research and the sciences. However, he admits that, though he has diverse interests, from empowering young people and developing scientific capabilities to finding solutions to problems through knowledge generation, none of these outweigh his passion for teaching.

In his current role as Research Group Leader at the CSIR, he is focused on growing the CSIR business portfolio in South Africa, Africa and internationally. Within the Cyber Warfare Research Group (RG), his responsibilities include liaising with partners such as the military, government and universities to develop strategic partnerships on projects and to collaborate with regard to cyber security and warfare capabilities as well as project management.

Unisa is one of the organisations that had the privilege of drawing from his expertise. Dr Mtsweni obtained his doctoral degree in Computer Science from Unisa, in 2012. He subsequently joined the institution in 2014, as a supervisor for master's and doctoral students in the School of Computing. He was given the opportunity to attend the School of Computing Vision Keepers at Howard University, in the US, in 2013.

"This is where I got to understand the impact of my doctoral degree, as I spent three months interacting with people in my field. There are not many doctors in my field, though it is a field of study that gives you the opportunity to impact and change the world and the world of computing."

Dr Mtsweni says that computer science is a discipline that is occupied with the technologies, processes and methods that can explain how computers are able do what they do. The building of computers, the functions they perform and the means by which optimal performance can be extracted from computers, are what scientists in this field concern themselves with. He states: "We need to know what other issues computers can solve, that humans cannot resolve quicker."

He warns that technology can be used for the good and the bad. "This is why we thrive on being at the forefront of innovation, the development of new ideas, projects and solutions within cyber space, while simultaneously doing research globally in order to understand current trends and their effects on our country. Western countries are far ahead in terms of technology, while Africa is still lagging behind, and that is why the CSIR is developing this area to make the lives of people better."

According to Dr Mtsweni, the military is one of their biggest stakeholders and they consult and advise them, on a daily basis, regarding cyber threats and defence methods. "It is a requirement to secure our country and defend it against adversaries such as other countries and, moreover, thieves."

Other stakeholders include universities and government. According to Dr Mtsweni, "We work with universities and advise them on new qualifications to offer the industry and the world of work. Nowadays, municipalities are also deploying technology, like Wi-Fi and meter readings, which have security vulnerabilities."

Regarding the CSIR's role in cyber security, Dr Mtsweni cautions that, "Cyber security is one of the fastest growing areas in the world and the challenge we face is a lack of skills. We've had an increase in cyber threats over the last 10 years, especially on the African continent. Africa is, unfortunately, prone to cyber attacks, which have become the biggest threat to cyber security. Criminal activities such as the stealing of identities, card cloning, personal information and, currently, ransomware, which seeks to victimise ordinary people, are becoming more prominent. The higher the demand for connectivity on the continent; the higher the threat on cyber security."

In this regard, he indicates that connectivity has increased on the continent and that this increase is driven by developments in mobile technology and broadband connectivity in Africa. He explains this phenomenon as follows: "There's greater access to cell phones and laptops and, thus, the internet and social media through WiFi in both rural and urban areas. Technology is improving and there advances in technology is much faster now. Technology is no longer merely a 'nice to have', as we have come realise its impact in many areas such as e-commerce, the health sector as well as advances in the education sector."

However, Dr Mtsweni advises that there is a need for measures to create more awareness about cyber security,

> We work with universities and advise them on new qualifications to offer the industry and the world of work. Nowadays, municipalities are also deploying technology, like Wi-Fi and meter readings, which have security vulnerabilities. **"**

specifically to improve the savviness of people, as well as organisations, to the dangers of technology. "The 'smart user, smart buyer' concept applies. I am currently involved in initiatives that focus on establishing socially relevant computing in order to address issues in our communities."

In light of the impact of computer science on society, Dr Mtsweni laments the scarcity of skills in this field and the lack of knowledge of the important role that it can play in society. On this subject he urges that question should be: "How can we set straight the myths about computer science?"

Other important questions that he raises are: "How do organisations and universities collaborate to address local challenges? In education, how do we inspire people to choose courses that have social relevance? How do we, at the same time, address gender imbalances and attract female candidates into the world of computer sciences?"

Dr Mtsweni notes that there is huge potential for women in computer science, as they are the key drivers in the agenda of transformation in our societies. "We need to tap into their potential. Our country needs females to play a role in these fields."

Finally, he also highlights the need to inspire and mentor young people, saying, "We must be able to inspire young people, our children, to be able to build our knowledge economy."

Dr Jabu Mtsweni

A **data-centric** approach for today's fast-paced world

By Busisiwe Mahlangu

Dr Eugene Wessels *works at King Price Insurance as a General Manager: Data Analytics. King Price Insurance is a young company, which is currently celebrating four years of service in the insurance sector – a sector that requires an in-depth understanding of data to facilitate complex business decisions to achieve optimal business performance.*

Dr Wessels has worked in the field of computer science for many years. Armed with experience as well as a PhD in Information Systems that he obtained from Unisa in 2014, Dr Wessels is very comfortable working in a fast-paced world, where data is voraciously consumed and in an industry where organisations are frequently confronted with even more complex decision-making processes.

His everyday tasks include data analysis, enhancing business intelligence (BI) and leading the enterprise data warehouse (EDW). "My department collects data, transforms its business value and analyses it to allow business to make sense of it," he informs us.

According to him, data analysis creates a platform for business reporting, performance measurement and accountability, at all the levels of the organisation. "Data is facts, information and statistics that we collect over a period of time. How humans interact and understand it is important, especially with regard to the many decisions we have to make within the rapidly changing insurance sector, which is, mostly, motivated by socio-economic factors."

Dr Wessels emphasises that the ability of a business to understand data is what gives the business a competitive advantage. "Very often people think that the business is performing in a certain way, but when the data is presented, the opposite picture is revealed."

Data analysis relies on facts, rather than perception. He insists that any organisation that not supported by data-driven decision making is probably out of touch with reality. "It is advisable for an organisation to adopt a more data-centric approach if they want to reap the long-term benefits, which include the ability to change and influence organisational culture and, ultimately, accountability for decision making."

We use data analysis to empower people to use technology in order to create visibility or reach so as to enhance business performance, wherever the end user of the information might be. The end goal is to equip stakeholders and business owners to be able to make better decisions that would lead to an improvement of the strategic effectiveness and efficiency of their organisations."

He asserts that right now, globally, the technology sector and future trends in this industry are pinned on innovation. "Increasingly, emphasis is placed on the development of data and intelligence and what can be derived from it. We have mega technology organisations around the world such as Google, Apple, MS, Uber and Elon Musk that drive the importance of the Internet of Things (IOT) and machine learning. This highlights the importance of collecting data and applying intelligence to enhance products and services."

Dr Wessels warns that data analysis also has its own security risks due to the fact that more organisations have come to realise the importance of the role of protecting data in modern society. "This is where we see the cons of technologies such as social media, which afford people the platform to share and expose their personal data on a daily basis. People are becoming increasingly sensitive to issues of privacy regarding their data, but they still continue to expose themselves."

"South Africa is no different to the rest of the world," he says, "people are becoming increasingly more technology-oriented as the bulk of citizens gain access to cell phones, smart televisions, laptops, the internet and WiFi. On the other side of the coin, we are seeing a surge in the number of companies that are focused on becoming data companies, whether they are selling services or products. Naturally, this means that the collection of data has become a source from which revenue can be generated and from which value can be derived."

Dr Wessels has spent 10 years working in the public sector, where he assisted in establishing state-of-the-art analytical platforms. It was during this time, he says, that he witnessed the benefits that could be gained from hard measurements of data, including improved service delivery and revenue collection. "The softer benefits included the sharing of knowledge and acting as an advisor across the various South African governmental departments. We received various accolades from the private sector and we were used as a reference point for other government institutions."

All of this experience has empowered him to move ahead with the initiatives he wanted to undertake, and which he is currently working on, namely to empower the insurance industry and people, in general, with the ability to analyse data. "We are building a flagship analytical platform that will enable aggressive profit growth; this platform can be used as a reference point by the insurance sector and, at the same time, it could help us to outdo our competitors. This is not only about boosting profits for my organisation."

> " people are becoming increasingly more technology-oriented as the bulk of citizens gain access to cell phones, smart televisions, laptops, the internet and WiFi.

"We are a privately owned organisation, founded on Christian values, and we are proud of what we do. We give away a significant amount of the revenue we generate to charities through our corporate social responsibility programmes and to grow God's Kingdom," he says.

As an expert in his field, he is often invited to speak on the topic of data analytics, statistics and probability, and a lot more. "Unisa's qualification has allowed me to research the field from an academic perspective, which, in return, empowered me to find its relevance to practice. Although a qualification is important, the ability to apply such knowledge, in conjunction with experience, has allowed me to become 'street smart'," he points out.

Giving students a

voice

- one show at a time

Sasha-Leigh Gonçalves

Popular media personality Gareth Cliff is well known for his razor-sharp thinking and speaking his mind without fear or favour. It was with this boldness that he ventured into unchartered territories by swopping his chair as popular host at a traditional radio station to launch CliffCentral.com, an internet-based platform.

Sasha-Leigh Gonçalves, a fourth-year LLB student at Unisa, first appeared as a guest on CliffCentral when she participated in a debate on the #FeesMustFall campaign. Today she is producer and co-host of the popular show called Youth Leadership Platform.

Sasha-Leigh shared with YOUNISA her thoughts on online radio, CliffCentral and the programme that gives students a voice.

"As the world became more technologically savvy and people were spoilt for choice with the latest technology gadgets on the market and novel apps abound, it was strange that the radio industry remained untapped. That was until CliffCentral.com, a disruptively online radio platform and the brainchild of Gareth Cliff and co-founder Rina Broomberg, changed the scene. CliffCentral provided South Africa the opportunity to be ear-witness to a new type of radio, something unradio."

Sasha-Leigh says that she was inspired by Cliff's decision to explore an unknown territory as he did. "It's like entering a tunnel with no opening or light at the end, yet you choose to walk through that tunnel to create your own opening. This takes a tremendous amount of fearlessness, optimism and true leadership."

The lesson Sasha-Leigh took from this is that you do not need a light at the end of a tunnel; you can find your own light. This is what she would like to share with others through her involvement in a show on CliffCentral called Youth Leadership Platform (YLP). It is broadcast in association with Student Brands on CliffCentral.com every Monday from 14:00 to 15:00 and aims to cultivate leadership and entrepreneurial skills.

Says Sasha-Leigh: "YLP is an online radio platform that encourages and facilitates discussions and debates by youths, to youths, about topics that matter to them. It is a platform that promotes and advocates for a sense of youth and student leadership and entrepreneurship within the South African context and subsequently within various fields.

"One of the primary aims of YLP is to develop a sense of leadership amongst our youth and teach them that their actions naturally have an impact on society. In addition, the idea of showcasing young leaders, entrepreneurs, thinkers and doers is of utmost importance to YLP, as we would like to provide a sense of recognition for such individuals and, in doing so, inspire and motivate our listeners."

As a young person and a Unisa student who values opportunities to speak her mind, Sasha-Leigh says she wants to assist in creating similar opportunity for other young people and students to express and further their thoughts and ideas, to partake in discussions and speak about their dreams.

"I find it incredibly important to ensure that platforms such as the YLP are open and freely available to our youths to speak their minds in an unrepressed manner. The uncensored nature of CliffCentral.com, where almost everything and anything goes, allows for this."

"Up to now, YLP has featured many young individuals who have contacted us via social media, hoping that they can share their stories, ideas and opinions. Some came onto the show to discuss their newly formed organisations and businesses. We've also featured up-and-coming musicians without any previous experience wanting to get their names and music out there. This is what the YLP aims to do – provide a platform through which anyone can share their story."

Sasha-Leigh believes that if young people come to realise the true value of their thoughts, it will not only be beneficial to them, but to the country as well.

She says it has become customary to restrict the idea of airing our thoughts on something we are passionate about, but if we understood the importance of literally speaking our minds, we would never close our mouths again.

"It's your time to speak," says Sasha-Leigh. "For youths who have something to say about anything – whether it is on politics, medicine, animal rights, food or the fine arts – this is the platform! Use your voice: it is your power and yours alone. Why? Because no one else has it."

Gareth Cliff on cliffcentral.com

"If you're a student, you can find content tailored for you online. You won't find that on mainstream media anymore.

Young people are able to make better use of their time by selecting the content they really care about in podcasts - that way, if you have a long commute, time between before or after work or alone time while at the gym, you can entertain, inspire, inform and empower yourself with what you hear, rather than just listening to whatever is on.

The Youth Leadership Platform on Cliffcentral.com gives young people a voice online. In fact, we're the overlap between social media and radio. Cliffcentral.com allows you to access the content you care about on the device you never leave behind - your mobile phone.

For a chance to appear on the Youth Leadership Platform, please e-mail sasha@studentbrands.co.za.

IS THE YOUNG GENERATION ADDICTED TO CELL PHONES?

When it comes to most teenagers and their cell phones, the saying "hand in glove" could updated to "cell phone in hand". Whether walking in the street, having dinner with the family or watching a sports game, they are forever chatting, texting or scanning their phones for new messages and updates. Besides being an annoyance to the rest of the company, is this attachment to their phones healthy?

Unisa's Youth Research Unit (YRU) in the Bureau of Market Research (BMR), which has done research on teenagers' increased dependence on cell phones, and Prof Deon Tustin, Head of the Bureau of Market Research, share their insights on cell phone usage among teenagers with YOUNISA.

The evidence that emerged from the BMR research study, among 5 000 adolescents in Gauteng, shows that cell phone overuse is indeed adversely affecting the social, physical and psychological well-being and health of many youngsters. On average, adolescents, by their own admission, spend an average of three hours daily on cell phone activities (i.e. texting, internet access, gaming and listening to music). This led the study to label contemporary adolescents as "nomophobes", "internetomanias" and "textaholics".

Internetomania - an individual's inability to control his/her use of the internet.

Nomophobia occurs in situations when an individual experiences anxiety which is due to the fear of not having access to a cell phone. Anxiety is provoked by several reasons, such as the loss of a cell phone, loss of reception or a flat cell phone battery.

Textaholics or obsessive texting is the compulsive and obsessive use of text messages in a way that can be detrimental to the physical and psychological health of a person.

Although the BMR study acknowledges that cell phones, if managed responsibly, play an important role in youth identity formation, they caution that these devices can be negatively reinforcing, especially if they are used to provide easy and immediate relief from feelings of anxiety, social exclusion or boredom.
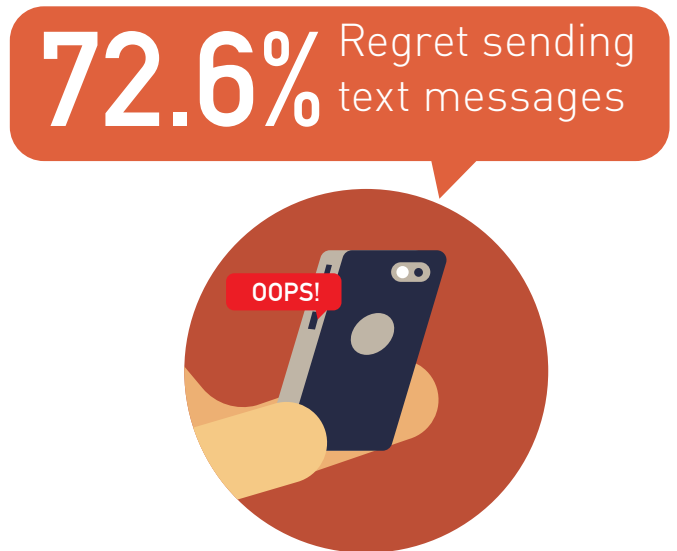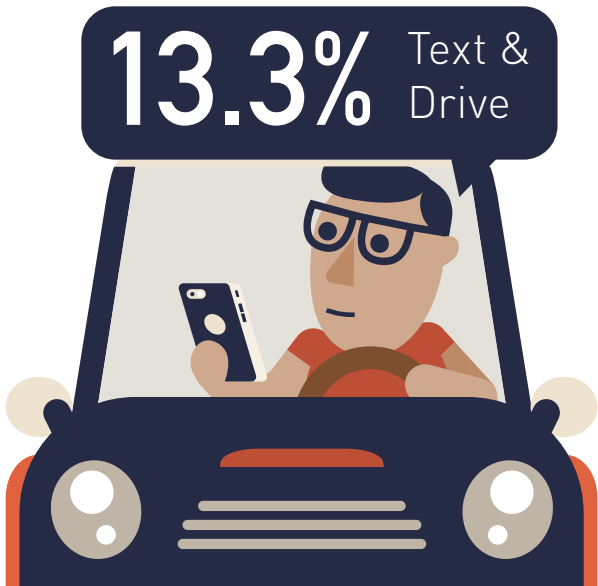
The symptoms associated with cell phone overuse among youth (12-18 years) can be compared to those symptoms associated with substance, gambling and online gaming addiction. Some of the typical signs and symptoms prevalent among adolescents dependent on cell phones and the internet are the following:

SIGNS AND SYMPTOMS OF CELL PHONE AND INTERNET OVERUSE

82% adolescents own a smartphone

%	Cell phone dependence
78.6	Constantly have cell phone close
67.0	Check cell phone when waking up
63.4	Cell phone switched on 24/7
63.0	Continuously check for missed calls
62.5	Run out of battery power every day
61.5	Cell phone distracts attention from homework
56.2	Use cell phone while eating out
55.0	Use cell phone in bathrooms
41.4	Frequently listen if cell phone is not ringing
22.5	Rather miss a meal than lose time on cell phone

Internet dependence	%
Stay online longer than intended	62.4
Avoid places with no network coverage	58.8
Become secretive when asked what doing online	45.0
Feel depressed when offline	42.1
Lose sleep due to late-night internet log-ins	40.6
Check e-mail before attending to responsibilities	40.5
Form new relationships with unknown online users	38.7
Get up at night to check Facebook	31.6
Use internet to relieve feelings of depression	27.1
Become anxious should parents block Facebook	24.1

20% Send sexual content by text message

13.3% Text & Drive

72.6% Regret sending text messages

OOPS!

Emotional impact...	%
Become irritated if someone does not answer text messages quickly enough	80.9
Become nervous at times when misplacing cell phone	78.5
Become irritated if someone does not answer voicemail messages quick enough	53.2
Feel uncomfortable and distracted when out of reach of cell phone	46.5
Experience anxiety/stress when without cell phone	44.9
Feel very frustrated without cell phone	43.9

However, although the BMR findings may cause concern about the well-being of contemporary adolescents, it also offers preventive strategies and acknowledgement among adolescents of the potential negative consequences that can result from cell phone overuse. The BMR research reveals that cell phones have become an integral part of the lifestyles of many high school learners.

However, it is enlightening to find out that some learners are showcasing responsible cell phone usage by, among others, turning off their cell phones in class and at night before going to sleep, using it as a learning tool and setting daily time limits for cell phone usage. These promising cell phone habits make adolescents feel safer, confident, relaxed and in control of their lives.

THE DOWNSIDE
OF TECHNOLOGY

Technology has changed our lives in many significant ways. Most notably, it has shrunk time and space. With access to the internet, we are able to crisscross the globe and beyond! For instance, courtesy of e-mail or Skype, we can have regular chats with friends and family from across the world and in real time. But, unfortunately, technology also has a downside.

One of the drawbacks of the internet is the exposure of children to inappropriate material such as pornography. The access to pornography has increased significantly among children. This can mainly be attributed to an increase in access to the internet due to mobile devices and children becoming more comfortable surfing the World Wide Web. In a recent study conducted by the Youth Research Unit (YRU), a research flagship programme of the College of Economic and Management Sciences (CEMS) that is hosted within the Bureau of Market Research (BMR), it was confirmed that children in South Africa are on par with their global peers where the viewing of online pornographic material is concerned.

The study, which was conducted among **2 890 secondary school learners in Gauteng, found:**
- **57.1%** of the learners have been exposed to pornographic material
- 80.8% of the exposure to pornographic material occurred through the internet
- primarily, learners were **unintentionally exposed to online pornographic** material while searching the internet for entertainment (49.5%), information related to schoolwork (39.1%) or sex education/curiosity about sex (29.0%)
- when exposed to online pornographic material, **30.8% of the learners either continued viewing the content or immediately closed the website** – in some instances, learners (3.6%) informed their peers about the content or even shared (1.9%) the content with their friends
- after the initial exposure to online pornography, **48.4% of the learners continued to intentionally search for pornographic material** – some even on a daily (14.6%) or weekly (23.7%) basis
- approximately two thirds (65.1%) shared the opinion that viewing online pornography **encouraged young people to engage in sexual activity (65.1%),** causing them to become more curious about sex (59.6%) or to view women or men differently (37.7%)
- 80.1% knew that, according to the laws of South Africa, only persons 18 years and older are allowed to legally access and view pornographic material
- more than half (52.8%) of the learners reported that their parents or caregivers have taken steps to protect them from exposure to online pornographic material
- these protective measures included talking to them about the dangers of online surfing – including pornographic material (75%) – and installing blocking or filtering software (26.1%) or limiting time spend online (22.0%)

BULLIES KNOW NO BOUNDARIES

Bullies come in many forms and guises and, apparently, they are also good at keeping up with the times! According to research done by the BMR's Youth Research Unit (YRU), cyberbullying is on the increase. Cyberbulling involves the use of electronic technology and examples include the sending of malicious text messages or e-mails and the posting of embarrassing pictures, videos or fake profiles on social media platforms.

Research conducted in 2016, among learners of 17 secondary schools in Gauteng, showed that cyberbullying increased from 16.9% (in 2012) to 31.2%. It emerged from the research findings that there are various risk factors that contributed to cyberbullying. These included the sharing of personal information (passwords) with friends, whom the victim met either offline or online. This risky behaviour correlates with a finding that learners who were victims of cyberbullying first reported that their passwords were stolen and they would subsequently discover that their social network profiles had been changed or a new profile had been set up on a social networking site, on their behalf and without their knowledge.
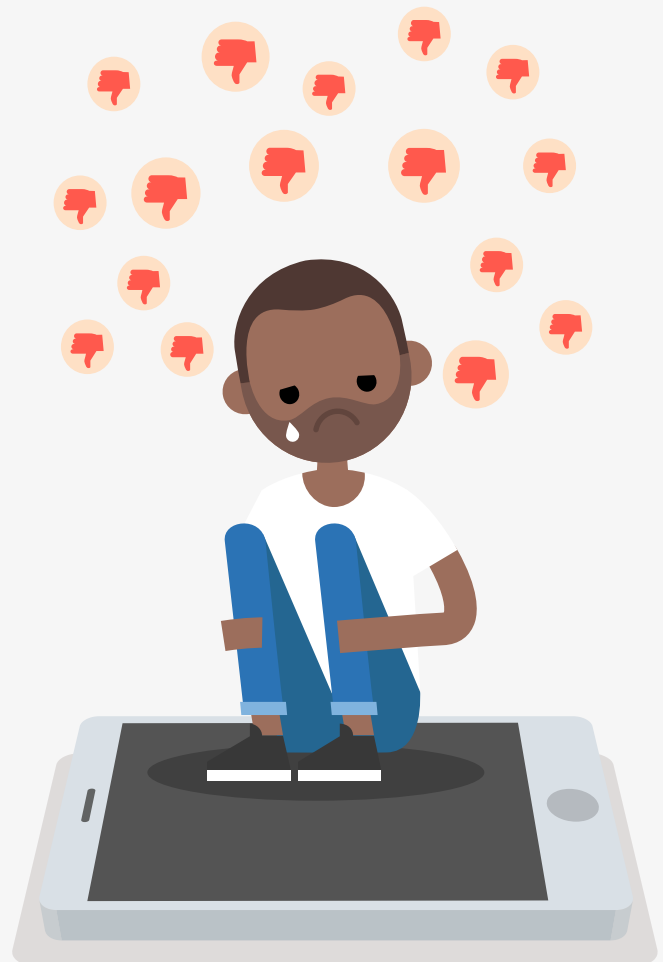
Creative *solutions* to *problems*

Some societal problems seem insurmountable, such as South Africa's education crisis, the dangers of mining underground and the marginalisation from mainstream entertainment of poor people. Three Unisa students with innovative ideas about solving these problems have won Talent Innovation Programme (TIP) grants to start developing their ideas into workable solutions.

They are Godisang Lefifi, who has just finished his final year of Electronic Engineering, Miriam Farai Siwela, a PhD student in Educational Leadership and Management, and Sandile Dladla, who completed his BCom Accounting degree in October this year.

The three have each received TIP funding from the Directorate Innovation and Technology Transfer, and were also part of a Unisa tour to Brazil to attend the 2016 Business Innovation Network Conference in Sao Paulo.

Locating trapped miners

Godisang Lefifi's own experience down mines, coupled with news reports of miners being trapped underground, made him think deeply. "I worked underground quite a lot for two years while I was with a company supplying safety systems, and it's not a nice place to find yourself, especially if an accident occurs. I used to think, 'Who is going to help me out if anything happens?'"

Lefifi, who runs his own small electronics business, put his engineering skills to work. First, he did some research to find out if the solution he had in mind was already on the market. It wasn't.

Next, he started conceptualising his idea for a device - similar to a car-tracking system - that would not only detect the location of miners trapped underground, but also ascertain if they are still alive.

Here's how it would work.

Miners going underground would carry a device clipped to their belts and weighing no more than three kilograms. Rescue teams on standby would be issued with similar devices. If noxious gases such as methane or carbon dioxide are present at unsafe levels in the area where the miners will be working, the device detects this and alerts them to the problem.

If no dangerous gases are present, Lefifi's system remains inactive until an accident happens.

"The system would be triggered by a fall of ground," he says. "If miners are trapped, the rescuers' device sends a signal underground to locate the miners via the devices they are carrying."

In addition to pinpointing the location, the system would have a pulse detection function so that the rescuers can tell whether or not a trapped person is still alive and if so, whether it is safe to move them.

When Lefifi presented his idea to the TIP panel of judges at Unisa's Student Showcase in August 2016, he showed them his drawings, explained the theory and basic electronics of the system, and won their confidence in the soundness of his idea.

"I am now designing the electrical circuits and will use my TIP grant to develop a working prototype," says Lefifi, who also won a prize for best oral research presentation at the Student Showcase event. This landed him a trip to India to visit Mumbai University, over and above his TIP trip to Brazil.

"I have one year to develop a working prototype and this is going to be my main focus in 2017. I am definitely going to make my miner location system happen."
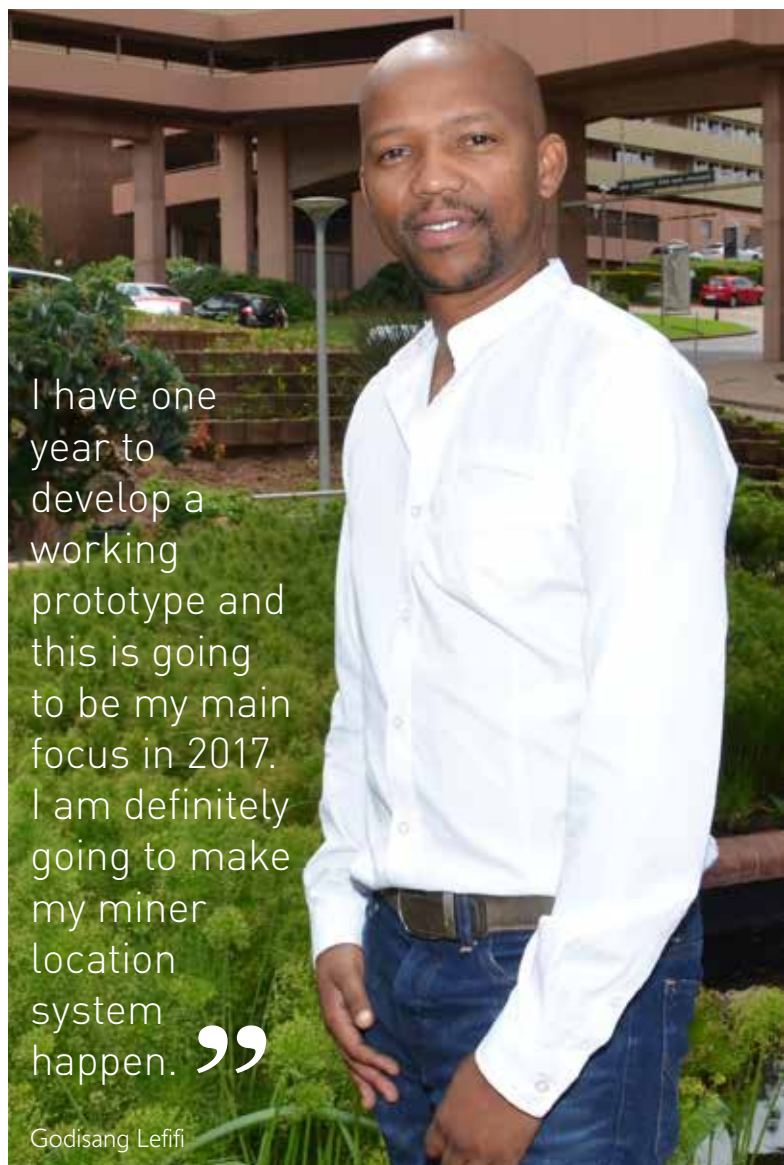
I have one year to develop a working prototype and this is going to be my main focus in 2017. I am definitely going to make my miner location system happen. "

Godisang Lefifi

Sandile Dladla

> On one hand it will open up market opportunity for both existing and upcoming artists and film makers by reaching mass demographics in a cost-effective manner, enabling content creators to capitalise on their talent. On the other hand it will give these industries' consumers what they want - convenience and affordability - by opening up access to content in formats, places and prices they demand it at. "

Affordable music and movies for the masses

High-speed internet has made movie and music streaming a reality for some South Africans but others, particularly low-income consumers, are being left out of the party. Sandile Dladla's idea for an entertainment kiosk could be music to the ears of these consumers - and for music and film content creators.

"The model seeks to address both the issues of the music and film content creators and their customers," he says. "On one hand it will open up market opportunity for both existing and upcoming artists and film makers by reaching mass demographics in a cost-effective manner, enabling content creators to capitalise on their talent. On the other hand it will give these industries' consumers what they want - convenience and affordability - by opening up access to content in formats, places and prices they demand it at."

He plans to do this by designing and operating music-and-movie kiosks that are similar to banks' ATMs and would be placed at high-density areas such as taxi ranks.

Inside the kiosk, the customer would log onto an online store and view the movie and music selection available. The customer would then download his or her choice onto a device (such as a USB stick), or write it to a CD or DVD. After paying for the purchase - at a price to suit his or her pockets - the customer would take it home and listen to or watch it to their heart's content.

Dladla has already been in contact with patent firms and conceptualisation consultants who could help him bring his media kiosks to life, using his Unisa TIP grant money.

"My next step is to produce a digital concept that I can present to prospective funders such as the Technology Innovation Agency (TIA) and the National Youth Development Agency (NYDA). I also want to approach a business incubator." Besides making quality entertainment accessible to low-income consumers, Dladla says his media kiosks could help combat content piracy - the scourge of the music and movies industry. "Low-income consumers can't afford to pay R100 for an original music album or movie DVD so they buy low-quality, pirated stuff that costs as little as R10. I want to bring them back to the mainstream by providing access to quality products that they can buy legally and still afford."

Education crisis - how can we fix it?

Low pass rates in mathematics and science, reports of learner-on-learner violence and bullying, and other alarming trends in South African education are depressing, but who's to blame?

"It takes a village to educate a child. All in the village are to blame," says Miriam Siwela. "But who is the village, and what should each of the village members be doing to play their part in education?" Who, for instance, should be responsible for the moral aspect of learning so that children grow up with sound values? And who is in charge of psychosocial development, and so on?

Clearly defining who should be doing what and how in education is the purpose of Siwela's TIP innovation, a model of stakeholder collaboration that she refers to as "Educating Learners in Totality".

"It's a model that approaches education holistically. Unlike the traditional education model that we have been stuck with, it is not limited to academics. Educating Learners in Totality (ELT) takes into account the cognitive, physical, psychosocial, volitional and moral aspects of education," Siwela says. "Like any good recipe, you have to use the right ingredients. If any of these ingredients are missing, we will end up with half-baked learners."

Money is not one of the missing ingredients, she adds, pointing to the billions of rands that donors such as foreign governments, UN agencies and other donors have pumped into education in Africa. "The problem is that 60% of learners, mostly in rural and high-density suburban areas, are not accessing the benefits that donors are bringing."

Because of a lack of access to infrastructure, electricity, the internet and transport, among other things, these learners are excluded from a comprehensive formal and informal curriculum that leads to diverse and varied career opportunities and entrepreneurship, she says. Hence, her ELT model of stakeholder collaboration emphasises the provision of the holistic education to marginalised and impoverished learners via the centre of the education village.

The model is thoroughly and methodically explained in her PhD thesis, to which she is now putting the finishing touches. Once her doctorate is behind her, Siwela will be using her TIP grant money to start putting her ELT model into practice.

The first step will be to develop a complete database of all education stakeholders, from government to NGOs and donors, and start reaching out to them through workshops and seminars.

"It is going to take time and a lot of resources and hard work to formalise my model and get everybody on board and working together, but this is my passion and I am committed to giving it my all."

The Talent Innovation Programme (TIP) is run by Unisa's Directorate: Innovation and Technology Transfer, to encourage innovation among students.

It's a model that approaches education holistically. Unlike the traditional education model that we have been stuck with, it is not limited to academics. Educating Learners in Totality (ELT) takes into account the cognitive, physical, psychosocial, volitional and moral aspects of education ,,

Miriam Siwela

NSRC champions interests of students

The 2016 academic year was marred by student protests demanding free education and transformation of the curriculum. While the discussion about the future of universities remains on everyone's lips, the National Student Representative Council (NSRC) at Unisa is optimistic about a fresh start to avoid academic disruptions and to ensure that quality service delivery is an apex priority.

Zandile Sodladla, the first female president of the NSRC, a Bachelor of Social Work graduate and a first-year student of Bachelor of Arts in International Relations, says their priority is to create a conducive environment for students to study and to fast-track service delivery to them.

"As the president, I will work with the team to formulate programmes that will assist students to progress efficiently with their academics. We will build relations with all the colleges to make sure that challenges faced by the students are resolved immediately. We will also work closely with the Department of Communication and Marketing to ensure free flow of communication and dissemination of crucial information regarding our work so that students stay informed about the nature of our task."

As they begin their two-year term of office, Sodladla vowed that she would remain an inspirational leader and accessible while ensuring that each member of her team honoured their constitutional obligations.

Members of the NSRC are, back: Rodney Mabusela (National Undergraduate Officer), Zonke Xanti (Treasurer General), Siyabonga Zulu (Deputy Secretary General) Wadzanai Mazhetese (National Postgraduate Officer), Itumeleng Molefe (Education and Training Officer), Grace Sebake (Sports and Cultural Officer); front : Sello Nkhatho (Deputy President), Zandile Sodladla (President), Tsholofelo Kgaswane, (Secretary General)

R28m earmarked to lessen fees gap

As with 2016, 2017 will be another testing year for higher education including Unisa, particularly with increasing demands for academic inclusion and financial support. The persistent demand for free education saw fee increases being capped at 8% for the year 2017, which is a figure that continues to promote uncertainty and create a wide financial gap for many other tertiary institutions in South Africa.

In an effort to curb the gripping effects of the #FeesMustFall on the university's fiscus, the Unisa Foundation Board of Trustees at its meeting of 16 March 2017 resolved to transfer an amount of R28m from the Unisa Foundation Development Fund towards student bursaries.

Chairperson of the Unisa Foundation Board, Dr Jackie Mphafudi said that the transfer was part of the obligation by the Board to distribute at least 75% of unrestricted funds raised each year. "Given the pressing demands of the missing middle, the Board felt that it was important to transfer these funds to financially needy and academically deserving students to further access and succeed in their studies."

Dr Mphafudi said that the Board is continually garnering the support of the public and private sectors as it views student access as a strategic project of the university. The Board, he said, "is also involved in other fundraising initiatives in order to lessen the fees gap created over the past two years".

Parallel to these initiatives, are the Board's fundraising missions in the USA and the UK. The Unisa Fund Inc was established as a fundraising vehicle for alumni, donors and citizens based in the USA, which ensures that donations comply with the laws governing fundraising by not-for-profit organisations in the USA.

Prof Mandla Makhanya, Principal and Vice-Chancellor of Unisa said that the generous contribution was received with excitement by student formations at Unisa. "They know that students are going to benefit immensely from the contribution as the Board supports their well-being."

He said: "Funds are earmarked for distribution during this academic year (2017) and will be disbursed using tried and tested methods. We will use the criteria used by NSFAS where the money will go to financially needy students with academic potential. The approach is also to allocate funds for the first semester but also ensure that students qualifying for the second semester are taken care of."

Prof Makhanya, however, stated that the requests from students for financial support surpass the resources available, which "clearly states that there is still a shortfall of funds and the university needs the support of its alumni who are key in university's fundraising efforts".

"This signifies that the demand for free education is not something that universities can resolve on their own but that the strong alumni base we have at Unisa can make significant financial contributions to alleviate the shortfall in student bursaries," added Prof Makhanya.

Dr Jackie Mphafudi
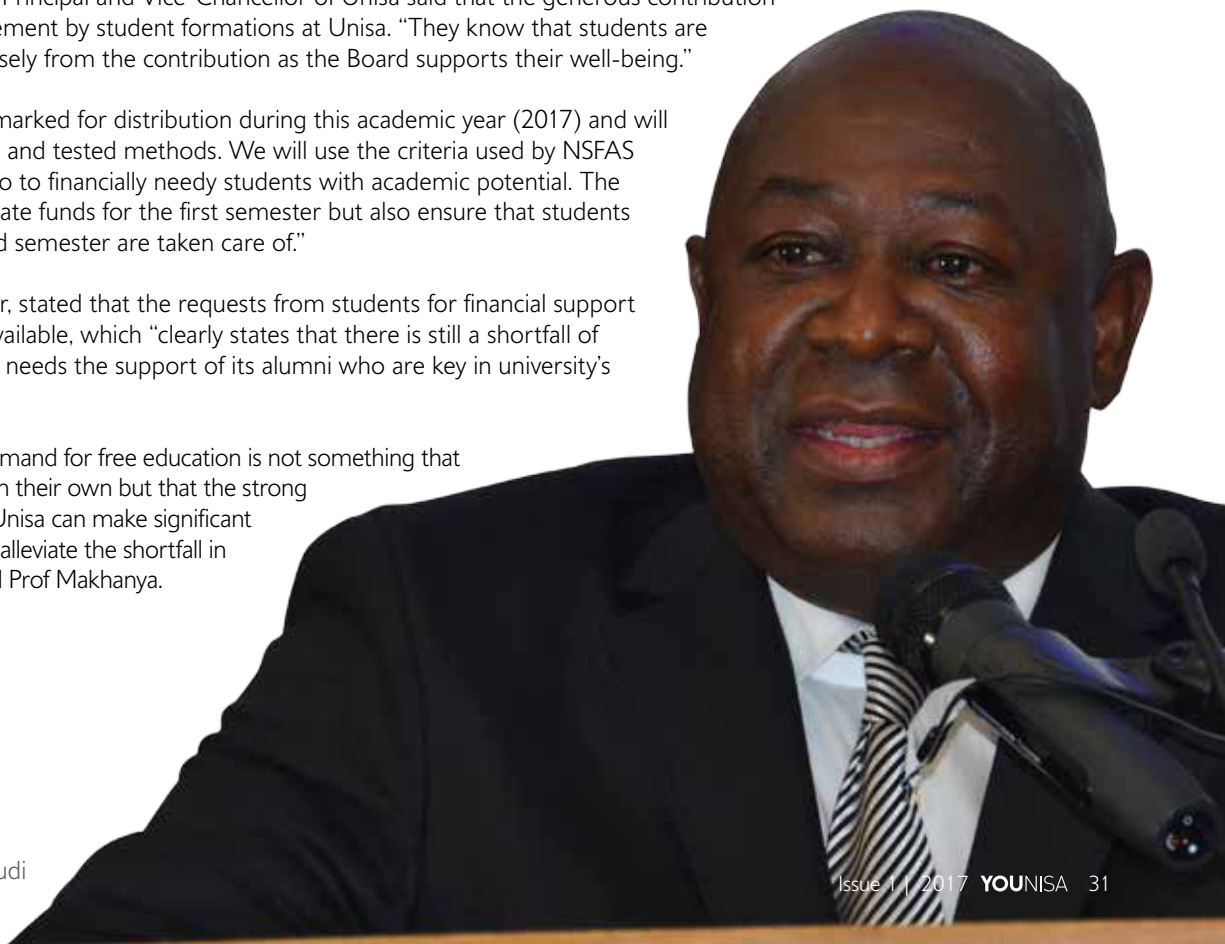
Proudly **African**

Unisa's Archie Mafeje Research Institute (AMRI), in collaboration with the African Institute of South Africa in the Human Sciences Research Council, hosted the Archie Mafeje memorial lecture at Unisa on 28 March 2017, in remembrance of a man known in academic circles as a frontline partisan in the struggle for social justice, and a gentleman of great humanitarian principle.

Professor Francis B Nyamnjoh from the University of Cape Town, delivered the lecture, entitled *Drinking from the cosmic gourd: How Amos Tutuolan can change our minds.* Mafeje was hailed as the finest Pan Africanist who spent the best part of his life

and scholarship contesting against the racialised epistemological underpinnings of a system of social knowledge production into which Africans have been co-opted and schooled as passive consumers without their voice, even on matters pertaining to their own realities and existence.

Dr Busani Mpofu, Prof. Michelle Havenga (ED: CGS), Sandile Swana, Thoko Didiza (MP), Prof. Francis Nyamnjoh, and Dr Claudius Chikozho paid tribute to a great Pan-Africanist at the 2017 Archie Mafeje Annual Memorial Lecture.

Paying homage to the African writer

"Writers create images of ourselves. But these are not mere mirror images. In many African societies the shadow is thought to carry the soul of a person," said Nathi Mthethwa, Minister of Arts and Culture. He was speaking at the Fifth International African Writers Day Lecture held at Unisa on 7 November 2016.

Hosted by Unisa and wRite associates, in partnership with the Department of Arts and Culture, the lecture formed part of the Fifth Annual Africa Century International African Writers Conference hosted under the theme *The role of writers' organisations in society.* The Africa Century International African Writers Conference celebrates the symbiotic relationship between literature, literary activities, and political liberation struggles which is most apt as we reflect on how far we've come and the lessons from this for the future.

Transformation stagnant across universities

A damning report released by the South African Human Rights Commission paints a bleak picture of deeply entrenched inequalities in all spheres of society, including higher education.

The report notes that more than 20 years into a democracy, South Africa continues to face deeply entrenched inequalities in all spheres of our society, including public universities. It argues that despite notable progress made in addressing historical inequalities in public universities, patterns of systemic exclusion, marginalisation, and discrimination persist.

The report findings informed discussions at a Unisa Leading Change seminar on transformation in February. Professor Mandla Makhanya, Principal and Vice-Chancellor, urged for an urgent overhaul of the institutional culture to promote inclusivity, anti-racism and ethical governance.

Vroom, vroom—Unisa 6 rides into history books

Working in the state-of-the-art engineering workshops at the Unisa Science Campus, students from the Department of Mechanical and Industrial Engineering built Unisa 6, a mini car, from scratch, to participate in the SAE Baja® competition for the first time.

Led by Dr Thembalani Sithebe, the team comprises students Bruce Ian Dutton, Ndishavhelafhi Ralinala, Queen Ndimande, Luan Badenhorst, Lebogang Clerrence Lebea, Busisiwe Sibongile Ndlazi, Yelaphi Ncube and Nyikane Abner Khoza.

The project requires students to design and build a prototype, four-wheeled, single-seater, off-road recreational vehicle, to meet a given set of design specifications. The vehicle must be safe, easy to transport and service, fun to drive, and good looking. It should also be able to negotiate rough terrain and handle anything a recreational user will most likely put it through. Apart from certain minimum safety requirements, the design is open to the initiative and ingenuity of the students.

The Unisa team managed to design and build a beautiful prototype which adhered to the specifications. The team went through all stages of the competition, but was unable to take part in the endurance race after the safety inspection.

Celebrating research excellence

Research excellence was celebrated at the Unisa's annual Research and Innovation Awards ceremony held in March. In all, 62 researchers, from emerging to well established, were fêted at the awards ceremony, held on 3 March 2017. Of these, a record number of 51 researchers were honoured for being newly rated or successfully rerated by the National Research Foundation.

The impact of the investment Unisa has made in promoting research in the past five years is clearly reflected in the figures:

2011–2016

Total publication output increased by **67%**

Scholarly books output increased by **271%**

2011

Black and women researchers are making significant contributions to the university's research output:

Black researchers were responsible for producing of Unisa's research outputs **193**

Women produced only **278**

Only 22 of Unisa's NRF-rated researchers at the time were black and only 44 were women.

2014

The position has changed dramatically after the introduction of 13 different research support programmes. The latest Department of Higher Education and Training report shows:

Unisa's black researchers were responsible for of the university's research outputs **436**

Women produced **372**

2016

Unisa black NRF-rated researchers were a total of **56**

Women NRF-rated researchers were a total of **72**

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"Native Question" is an equation: y = f(x)

Delivering the first 2017 College of Human Sciences Africa Speaks lecture, University of Johannesburg's Professor Nyasha Mboti said that this algorithm lies at the heart of empire, colonialism, and modernity.

Mboti's presentation was entitled *Y=f(x) When hosts depend on parasites—towards a new forensics of the "Native Question"*. He said most analyses of modernity and its genealogies of slavery, empire, and colonialism have hardly grappled with the notion of the Native Question as a theoretical construct. He proposes refurbishing the notion of the native question for contemporary use. "If we can define the Native Question, we would have gotten some way towards revealing the heart of persistent coloniality: why things are the way they are today."

Former Ghanaian first lady visits TMPL

Former Ghanaian first lady, Nana Konadu Agyeman-Rawlings, paid a surprise visit to the Thabo Mbeki Presidential Library (TMPL) at Unisa on 3 February 2017.

She was accompanied by her daughter Asantewaa Rawlings, and Zanele Mbeki, the former South African first lady. Agyeman-Rawlings is the wife of Jerry John Rawlings, who led Ghana as a head of state during the 1980s.

Agyeman-Rawlings said the visit was aimed at gaining first-hand information about the library and its functionality. She praised the library, saying it was a classic institution that would allow future generations to learn about the history of the African continent and the role of former President Thabo Mbeki in the struggle against apartheid.

Agyeman-Rawlings said she admired how the library preserved the history of the former statesman, and the partnership between Unisa and the library was remarkable because it allowed the public to have a glimpse of the history of the Mbeki era.

She said that her family intended to set up a similar presidential library in Ghana, which would preserve the legacy of her husband.

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## Researching power and identity in African state formation

M R Doornbos and W M J Van Binsbergen

The book illuminates key aspects of how, historically, the dynamics of power and identity interact in the African context, generating the kind of political structures and collective actions that have often appeared characteristic for the continent. It examines some salient dimensions of the broader frameworks of hegemony and power imposed upon African societies in the context of larger geopolitical and historical processes. Power and identity are two key concepts which can be applied in describing African realities. The interaction and connections between the two concepts are, moreover, of key importance in the African context, as their studies demonstrate.

In common with other scholars in this area of study, the authors acknowledge that underlying their work is a compelling fascination with the continent's evolving social and cultural forms. Their insight into African social reality reflects a fragile and fragmented continent capable of bringing forth a great variety of agents and actors in the interplay of social and political power: power vested in a variety of groups, ethnicities, religions or classes, with potential to impose on the identity of others.
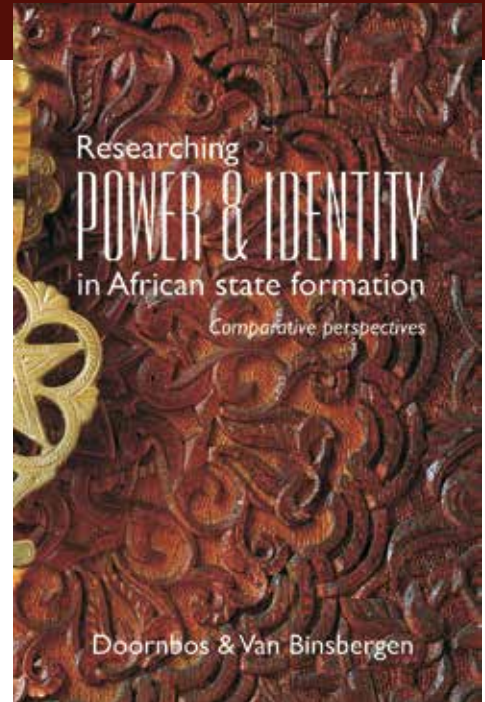
Magnet Theatre: Three decades of making space
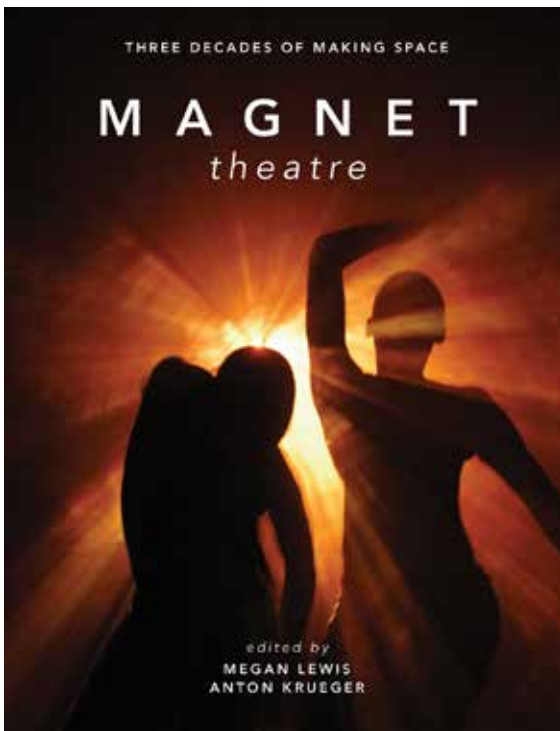
Editors: Megan Lewis and Anton Krueger

Cape Town's Magnet Theatre has been a positive force in South African theatre for three decades, a crucial space for theatre, education, performance, and community throughout a turbulent period in South African history. Hot off Unisa Press, *Magnet Theatre: Three decades of making space* offers a dialogue between internal and external perspectives, as well as perspectives from performers, artists, and scholars. The book analyses Magnet's many productions and presents a rich compendium of the work of one of the most vital physical theatre companies in Africa.

The book is divided into three parts:

- Concepts: Making space for ideas
- Collaboration: Making space for embodied practice
- Community: Making space for cultural interventions

Touched by Biko

Andile M-Afrika

This new offering by Unisa Press is a political memoir of life in a rural South African township, with author Andile M-Afrika weaving a creative narrative about events surrounding this country's struggle history, where Steve Bantu Biko played a pivotal role.

What M-Afrika calls a "political novel" delves deep into his personal encounters with people, events, and day-to-day life in rural King Williamstown in the Eastern Cape. The pervasive influence of Biko's presence on those who shared life in this historic village speaks volumes. "I have always been moved by the impact of Steve Biko on his and my generation," says M-Afrika. "I feel he has touched many of us."

M-Afrika lived just across the street from the struggle icon, and takes us on a highly personal journey. His insider's account about the everyday turmoil of life leaves readers with a vibrant, accurately drawn impression of events that flowed through the village.

The book is filled with direct references to particular buildings and events specific to the area and the time. As M-Africa says, "Writers create images. Today, the images of my street and my township borrow much from the silent shade of Bra Steve and from his leading pen."
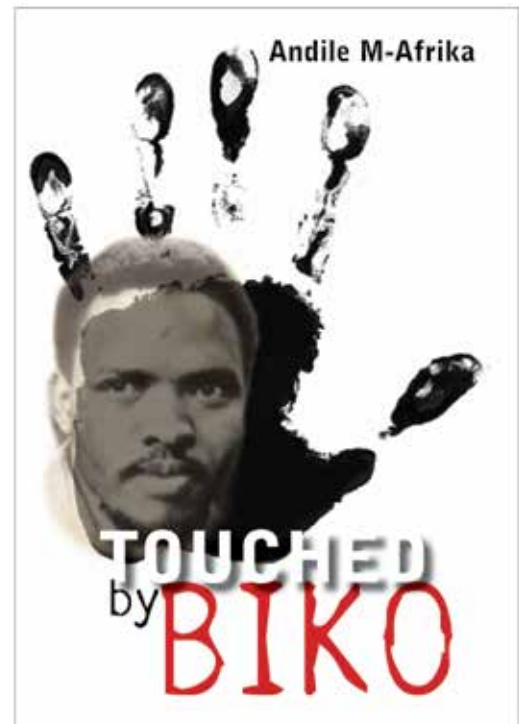
Chaka – Die nuwe Afrikaanse vertaling
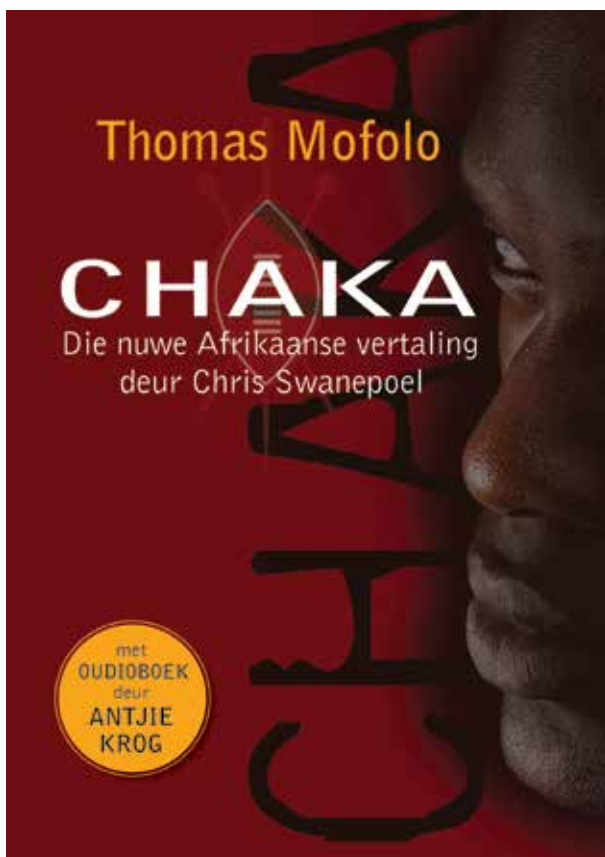
Thomas Mofolo (translated by Chris Swanepoel)

The novel, which was originally written by Thomas Mofolo in Sesotho, has been translated into many languages, and is a highly regarded literary work based on the legend of the Zulu King Chaka. It was among the top five on a list of the 100 most influential texts ever published in Africa.

Mofolo weaves a creative tale that is not strictly bound by historical facts and where the Sesotho and Zulu cultures are interwoven. "This is a key text that should constantly circulate in all the languages of South Africa," says Unisa's Professor Andries Oliphant.

The story of *Chaka* is written in highly accessible language and is a gripping tale of political power, high drama, action, bloodshed, love, and deep sorrow. Readers from all walks of life will enjoy it, and it is suitable for reading by mother-tongue speakers, students from high school to university, and the general reading public interested in literary traditions and works originally published in African languages in South Africa.

The *Chaka* Afrikaans translation is accompanied by an audio CD, which will be sold separately and online at some stage. Listeners have the added advantage of narration by Antjie Krog, renowned scholar and herself a poet, whose voice succeeds in subtly conveying meaning and nuance within various characters.

The sound files were edited and finalised for production at Unisa's Sound and Video Unit by Vellie Sibuyi.

Take your *career online*

The 21st-century technology revolution has in recent years resulted in a great many apps and online solutions used by students, professionals and … well, just about everyone on the planet with internet access. The excellent online resources offered by the Directorate for Counselling and Career Development (DCCD) have been designed to afford users a study and career guidance experience second to none.

The major advantages of the internet, namely the easy availability of information, connecting with others and building your online profile, are also some of its major disadvantages. Dealing with all the information and people online can become overwhelming.

Develop your digital career literacy to help you capitalise on what the internet has to offer to help you manage your career:
- Learn how to use the internet to search for information to answer your career questions.
- Connect with employers on social media (especially LinkedIn).
- Build your professional network.
- Build your online profile.

The goal of the DCCD website is to provide you with some "signposts" that you can use to help you navigate online resources. The career resources focus on **Planning your career, Exploring careers, and Preparing for career opportunities.**

Planning your career, figuring out where you will work after graduating, or changing your career direction can be overwhelming.

The online resources offered by the Directorate for Counselling and Career Development can help you answer those questions and more.

Plan your career

Planning your career is not a once-off event – you will make many career decisions and choices over the course of your life. Effective career management involves understanding yourself, and knowing about different possible opportunities. The Plan your career section of the DCCD website can help you link what you know about yourself to possible career opportunities.

Start here:
Work through the self-knowledge brochure to help you with the choices you are making now, but also for future decisions.

Exploring careers

Once you know yourself better, you can make use of the Explore Careers section to find comprehensive information on different career fields, and link different career fields with your interests and skills. These resources can help you, whether you are starting out with your career journey or thinking about changing your career direction. There are three parts that you can explore:

- **Ways to find career information:** learn more about how to do research, including using online searches, career information websites, job search websites, and social media (specifically LinkedIn);
- **Careers related to your interests:** after finding information about what you want and where you see yourself, you can link that to your Unisa qualification; and
- **Career options related to Unisa qualifications**, based on your interests you can select a qualification at Unisa.

Start here:
- Go to the Linking your interests to Unisa qualifications page and find your field of study. View the possible job titles and work environments related to your qualification.
- Download the 8 ways to do career research document and start with your career learning plan

Prepare for job opportunities

The **Prepare for job opportunities** section has all the information and tools to help you prepare for entering the world of work. You can learn more about searching for career opportunities, creating and expanding your professional network, creating a marketing campaign (including your career portfolio, CV, cover letters, online profile), preparing for job interviews, and using LinkedIn as an important part of your career development.

Start here:
- Complete the **employability checklist** to identify the aspects you still need to attend to.
- Expand your professional network and join the Unisa Career Connections **LinkedIn** group. To join is easy: Sign in to your LinkedIn account, search for "Unisa Career Connections group" and request to join. Once your application to join is approved, start participating in the conversations.

Websites and apps

The following websites and apps can also help you with your career development:
- National Career Advice Portal (Kheta) **(http://ncap.careerhelp.org.za/)**
- The Muse **(https://www.themuse.com/)**
- Quintessential Careers **(https://www.livecareer.com/quintessential)**

Search for the following apps on the App Store (Apple) and Play Store (Android):
- Indeed (South Africa)
- LinkedIn and LinkedIn Job Search
- Career Xplora (only on Android)

Do you have a career question?

Visit the DCCD website at **http://www.unisa.ac.za/** counselling or send an e-mail to **counselling@unisa.ac.za.**

Compiled by Suzan Kekana, Beauty Mabunda, Yollandah Mathaba, Nhlanhla Maphetu, Leza Deyzel and Tshifhiwa Kodisang from the Directorate for Counselling and Career Development

A computer is
not a device
anymore.
It is an
extension of
your mind and
your gateway to
other people. **99**

- Mark Shuttleworth