UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
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JuniorTukkie MAGAZINE

May 2020 Edition

UP relevant and competitive in the next INDUSTRIAL REVOLUTION

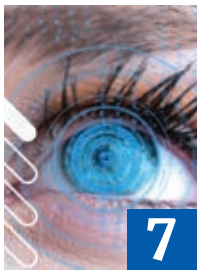
Inside this issue:

www.up.ac.za/juniortukkie

Contents

May 2020 EDITION

UP relevant and competitive in the next industrial revolution



View the JuniorTukkie magazine online:
www.up.ac.za/juniortukkie>JT magazine

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Editorials

A leader in all of us

Very often there is a tendency to consider leadership to be about those who are in positions of power, leading people in organisations and possibly significantly older. While an element of truth exists in the above statement, leadership is not limited to these factors.

Today I would like to challenge all learners and students to accept that they are leaders. For leadership takes different forms and shapes. Among other things, leadership is also about finding thát which you are so passionate about and doing it so well that it becomes difficult for us, the country and indeed the world, to ignore you. It is about living your potential and passion as a singer, artist, accountant, mathematician or scientist and achieving wonders in your chosen space. There are many people who don't necessarily have titles but are leaders in their fields. In many instances, nobody chooses such leaders—they choose themselves by realising and actively using their God-given talents and abilities.

Some of you might be uncomfortable with my attempt to promote you to be a leader when you don't consider yourself to be one. My main intention is to get you to realise that tapping into your leadership potential is a choice. Some of you might choose to acknowledge this but do nothing about it, while others might choose to own this leadership potential and look for opportunities to develop it even further. In essence, many of you reading this are leaders or potential leaders. The question is, have you realised this leadership potential?

Some leadership takes the form of 'thought leaders' in various fields. These are individuals who don't necessarily have titles but have dedicated many years to hard work in an area. Today, they are so well-versed in their chosen area and contribute towards shaping not only views but also initiatives and practice around that space. For example, I have been in corporate social investment (CSI) for over a decade—after another ten years with my current and possible future academic qualifications, I would be a perfect candidate to be a thought leader in CSI. We must encourage this kind of leadership, even though it is difficult because it acknowledges the need for people to put in the time in pursuit of meaningful experience.

An important point to emphasise is that leaders live a purpose-driven life. Their passion—that which they are so good at and respected for—is linked to a purpose deeper than just making money. Linked to this purpose is a high degree of optimism and inspiration. It is people who see good in themselves and others, and believe in their potential and ability to a point where they inspire others to either follow in their footsteps or realise their own potential, who contribute positively to the confidence of others.
In closing, I would like to encourage all of you to search for your leadership potential and ability—for South Africa, the continent, and indeed the world, needs as many leaders in as many spaces as possible.

Best wishes,

Mr Setlogane Manchidi
Head: Corporate Social Investment, Investec

JuniorTukkie's survival in the next industrial revolution

For most people around the world the prospect of a future in which robots and computers can perform many human jobs is a source of personal concern. It is therefore important for the young generation to make themselves ready for this revolution. The biggest fear of mankind is that technology will destroy people's jobs and that computers will take over the world. Your future is in your hands. It is important that you overcome this fear for you to proactively and thoughtfully do your research on the future of work in this new industrial revolution. You must also develop the following skills: complex problem-solving, creativity, judgement and decision-making, cognitive flexibility as well as people management.

Schools and universities will change their fields of study and careers will be developed where you must aim to be part of the change and not wait for it to happen. Robotics, coding and cyber security are just a glimpse of what can happen in the future. Therefore, your aim must be to become computationally literate.

As part of the next generation to conquer the world you must know that automation will transform our work, our lives and our society. Getting this right is among the most important and inspiring challenges of our time. You must not only change your thinking, but as a JuniorTukkie leader you must help to lead the way in the next technology revolution. Do not make it someone's problem, but become part of it. It is up to you to learn how to use new technology and overcome your fear so that you are not left behind. It is also important to serve your community and society in your journey into the next industrial revolution.

Therefore, change your thinking to join in developing creative, collaborative solutions and help to build a future in which technology will also work for you.

Best wishes,

Dr Petrus Lombard
Project Manager: JuniorTukkie

Editorials

Preparation is crucial in an influential life

How to cope and conquer the demands of the 5th industrial revolution

By Anthea Pretorius

As the 5th industrial revolution dawns we find ourselves in a culture which is filled with volatility, uncertainty and also a great degree of insecurity and uncertainty about whether or not we will cope.

All of us long to lead lives filled with creativity, productivity and prosperity, but often we find ourselves a bit lost, doubtful, fearful—even that we do not have the reservoirs of bravery we might need in life. Too many of us feel our lives are weakly lived and not powerful.

What is needed to lead a productive and influential life, a life that is world-class and fiery?

Robert Sharma says: 'World-class begins where your comfort zone ends. Becoming legendary is never easy…the place where your greatest discomfort lies is also the spot where your largest opportunity lives. When you are faced with projects that unnerve you and the insecure part of you is resisting, that is precisely where you need to go to.'

Sharma also writes in his book, *The 5am club*, that 'We have to guard our cognitive assets. We need to surround ourselves with human beings who fuel our joy, stoke our peace and excite us to become better men (and women). Life's way too valuable to hang with people who don't get you or who have different values and lower standards than you do. The danger exists that being ordinary becomes acceptable and you worry more about fitting in and being popular than in standing out and making a significant difference.'

Technological innovations are changing and shaping our world continuously. Difference-makers are applying themselves to one aim; they are specialising in their postgraduate studies; they are devoted to deep preparation and dedicated in their focus to become specialists in their field.

The dangers of distraction

Sharma warns that 'the greatest danger to mastery today comes from a world tempting you into distractibility. An addiction to distraction is the end of your creative production. Empire-makers and history-creators take one hour for themselves before dawn, in the serenity that lies beyond the clutches of complexity, to prepare themselves for a world-class day. Excuses breed no genius.

People addicted to their devices are "cyber zombies". They are not present. They are half-alive to life. Protection from distraction is precisely how you need to work if you're serious about dominating your field and winning at your craft.

Eldar Shafir writes: 'We have limited cognitive bandwidth; a limited mental capacity to give our attention to numerous influences—we leave bits of our focus on each activity we pursue.'

Sophie Leroy found that people are far less productive when they are consistently interrupting themselves by shifting from one task to another… because they give valuable pieces of their attention to too many different pursuits. Work on one high-value activity at a time instead of relentlessly multitasking—and do so in a quiet environment.

Sharma concurs. 'Spend your days diverted by your devices, tethered to television and majoring in mindless pursuits and your brain will be weak and flabby through your mistreatment of it. It will atrophy. And this will result in weaker cognition, slower learning and lower processing power. Your targets will elude you. On the other hand, when you use your brain intelligently by expanding its limits and running it like a titan, it will expand and increase its connectivity causing important gains in your productivity, performance and influence.'

How seriously do you want the rewards that your ambitions seek?

In the beginning of our careers, Sharma writes, we are 'dripping with dreams and set to make our mark on the world. We are hungry to prove ourselves. We are amped to dominate the game…we are seeking legitimacy; we crave social approval. We want our peers to respect us.' But the reality is that the majority of people are 'sinking in the quicksand of uncertainty, boredom, distraction and complexity.'

Editorials

Labour for the impact you can and want to make.

'Our culture tells us to pursue titles, applause, acclaim, money and mansions,' but, writes Sharma, 'Real power never comes from anything external. Genuine power and real riches come from living by the noble virtues of productivity, self-discipline, courage, honesty, empathy and integrity…'

What is your creative vision? What is your moral blueprint? The two core areas in which you need to excel are personal mastery and professional capability, and that is what you are working on as a student at university.

'Don't allow yourself to get trapped in superficiality or in vague, imprecise thinking', for as Sharma writes, 'that yields vague, imprecise results. Legendary achievers are vastly different. Insist on greatness in all you do. Your name is branded onto every piece of work that you release. The grade of work you offer to the world reflects the strength of the respect you have for yourself. Bring rigor to what you do. Consistency really is the DNA of mastery.'

Sharma insists that 'history-makers capitalise on their natural talents. They live with honour, nobility, audacity and integrity. They understand that there is a staggering difference between being busy and being productive.'

Sharma goes on to stress that, 'high-impact performers and genuine world-builders aren't very available to whoever seeks their attention and demands their time. They are focused on doing real work, so they deliver the breath-taking results that advance our world. They do not mindlessly surf online, drink or eat too much, or sleep too much. The illustrious and noble souls of our world become strong, brave and moral whilst standing resolutely in the storms of adversity, difficulty and doubt.'

'It is in the moment that you face your deepest weakness that you receive the chance to forge your greatest strengths.' Sharma writes, 'Real power, then, comes not from a life of ease, but one of intense effort, devoted discipline and demanding action in the direction of what your supreme self knows to be right. To continue at a time when you ache to stop. To advance when you long to quit. To persist in the instant when you feel like giving up is to claim your membership among the great warriors and honourable characters who led humanity to a better place.' He therefore recommends that we should, 'bulletproof our distraction defence system; reject any stimuli that might undermine our focus; avoid silly videos, irrelevant chatting and other forms of cyber-hooking that will destroy your life of monumental potential, and deliberately craft the spaces you want to inhabit that will ultimately shape the output you produce.'

Rest and recovery are crucial

'The recovery cycle could include going for a quick walk in fresh air, reading a book…, meditating, visualising or listening to energising music…' writes Sharma. He goes on to suggest that 'every high-excellence cycle is followed up by a deep refuelling cycle. Set aside blocks of time for refuelling, relaxing, recovering and pure fun.'

He also says that we should, 'spend long stretches in noiseless contemplation—it is one of the secrets of the advanced mind. Become a collector of awesome experiences instead of a consumer of material things. Fill your life with exceptionally excellent, enterprising, healthy, positive, ethical and sincerely loving people. And over time, you will exemplify these lofty traits.'

Source: Robin Sharma. 2018. *The 5am club: Own your morning; elevate your life.* Thorsons (HarperCollinsPublishers). www.robinsharma.com/The5AMClub

In the world today the demand for our attention is relentless. Without realising it, we engage in obsessive thinking; we judge ourselves and others; and we numb ourselves; the speed at which things happen is becoming faster and as a result many modern folks are restless and impatient.

Mental control towers are very powerful today. Technology is holding us captive. We are addicted to thinking and disconnected from feeling and experiencing deeply.

The intensity of our compulsive thinking is in direct proportion to the centre where we are not willing to experience our bodies in that moment. To avoid the angst, we keep on churning in our minds. We obsess.

My concern is that we are often dissociated from real life because of our devices. We need to find pathways home, while dealing with the challenges of pain, fear and trauma, loneliness and disconnectedness. Meaningful reconnection calls for embodied presence.

We have lost contact with the living reality, and when out in nature, away from technology, we rediscover the mysterious, sacred presence of the natural world. This is the only place we will find true healing. That is where I awake to full awareness and to full aliveness. Our bodies know how to give birth and dance, and live and laugh and have fun, and our bodies know how to die. Our bodies know they belong to the universe. It is our minds that forget and need to remember.

Joy, connection and belonging—intimacy with Earth is scarce today. Everyone is connected to a device, but disconnected from Earth.

Pure consciousness is when our body and our minds are at the same place at the same time: That is the portal to embodied presence.

We need to create space to breathe, to experience, to be mindfully present in every moment. Freedom, joy, tenderness and peace lie in a different place than what technology offers us.

Preventative steps we can take to keep up our mental resilience and well-being include practising good emotional hygiene. That means connecting meaningfully with others, getting outside and moving our bodies, putting healthy foods on our plates and getting enough sleep—being kind to ourselves. Give yourself a break. Take regular digital fasts. Laugh at least once a day. No matter what else is going on, find the humour in being human.

Editorials

'Do not allow your fire to go out, spark by irreplaceable spark in the hopeless swamps of the not-quite, the not-yet, and the not-at-all. Do not let the hero in your soul perish in lonely frustration for the life you deserved and have never been able to reach. The world you desire can be won. It exists. It is real. It is possible. It is yours.'

(Ayn Rand)

'This is the true joy in life, the being used for a purpose recognised by yourself as a mighty one; the being a force of nature instead of a feverish little clod of ailments and grievances complaining that the world will not devote itself to making you happy.'

(George Bernard Shaw)

'You don't have the brain you want; you have the brain you've earned. You don't have the brain you desire; you have the brain you deserve—based on how you've been operating it.'

(Robin Sharma)

News

Catch your dream boat to success with JuniorTukkie

JT helps you to:

- make the leap from high school to university with ease;
- make responsible study and career choices;
- be prepared for the demands of your chosen programme; and
- improve your marks in Mathematics and Physical Sciences by attending the Grade 11 Summer School or Grade 12 Winter School.

Winter and Summer School

Grade 12 Winter School (Mathematics and Physical Sciences):
Tel +27 (0)12 420 6606 | Email themba.maluleka@up.ac.za

Grade 11 Summer School (Mathematics and Physical Sciences):
Tel +27 (0)12 420 6606 | Email themba.maluleka@up.ac.za

Learners from Grade 9 to 12 are welcome to join JuniorTukkie

- Download the web-based JT App: juniortukkieapp.co.za
- On the JT App, go to: JuniorTukkie > Become a JuniorTukkie
- Complete the JT Membership Form

Once you are a JuniorTukkie member, you will be invited to apply for attendance* of any of the following events:

- Preparation Conference for Grade 12 learners
- Faculty information sessions for Grade 11 to 12 learners and their parents
- Information sessions for Grades 9, 10 and 11 learners and their parents
- The 'Walk-the-Talk with UP' day for Grade 10 learners and their parents
- Welcome function for new first-year UP students (JT members).

*Terms and conditions apply for each of the above events.

Contact JuniorTukkie
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News

Visual intelligence for Industry 4.0

By Minda Marshall

Currently, headlines in the media are painting a bleak picture of education, both locally and globally. According to a recent article by Silvia Montoya, Director of the UNESCO Institute for Statistics (UIS), 617 million children and adolescents worldwide—six out of ten—are not reaching the minimum proficiency levels in reading and mathematics[1]. This gives us a reason for concern, especially in a time where the world is changing faster than you can say Industry 4.0.

The basis of good literacy skills is reading, but reading is not a natural process. The human mind is not wired for written information—therefore learning to read, and using accurate skills and strategies to navigate the growing oceans of information is fundamental to achieving success in Industry 4.0. If we cannot obtain adequate skills by Grade 4, students will continue to struggle throughout their school career, and more than likely end up leaving school without the skills needed for further study or the ability to function in a decent job.

As students improve their visual processing in reading, they also achieve greater capacity and mental energy that they can devote to understanding complex ideas. It is the integration of foundational areas in reading development, and combining various skills, and strategies that provide an entry point to multiple literacies and improved visual intelligence.

Neuroplasticity and the impact on teaching reading

Neuroscience confirms that your brain is a self-organising creative system. Every skill and ability you have was constructed in a specific region or in various regions of your brain, as a result of practice and application. Learning is connecting neurons, by developing neural pathways and enhancing neural networks.

Neuroplasticity is described as the brain's ability to reorganise itself by forming new neural connections throughout life. Connections within the brain are continually becoming stronger or weaker, depending on what is being used. This is the 'muscle-building' part of the brain, the physical basis why repetition strengthens the power of choices and actions. Over time it becomes automatic—a part of who we are. The greater impact of developing reading skills is seen in improved visual intelligence.

1 http://uis.unesco.org/en/blog/meet-sdg-4-data-measuring-youth-and-adult-literacy-and-numeracy

News

The EyeBrainGym process

In our long-standing relationship with the JuniorTukkie project team (more than 10 years), we saw significant improvement for students participating in various LAB-on-line projects. With LAB-on-line, we studied more than 100,000 student profiles in the past ten years. We learned how to harness the actions of reading, learning and neuroplasticity in a way that allows us to configure the eyes, muscles, neurons, and mind in defined patterns to interact in an improved way with information.

We are proud to announce that we are launching the next level of visual processing, reading and cognitive development.

EyeBrainGym is based on the data and results gathered on LAB-on-line, and brings together ten years of experience. It combines this knowledge with cutting edge technology geared towards upscaling abilities for the development of the workforce South Africa needs in Industry 4.0. EyeBrainGym help users to see more, read faster, learn quicker and remember better.

The ability to process volumes of information and use new knowledge creatively to address challenges will become more vital within the context of Industry 4.0. Each person will, more than ever, need the abilities to learn, unlearn and re-learn vast amounts of information as quickly as possible. Join us and the JuniorTukkie project team in maximising the #ReadingRevolution and empowering our students with the critical skills they will need to succeed in the future.

Contact information
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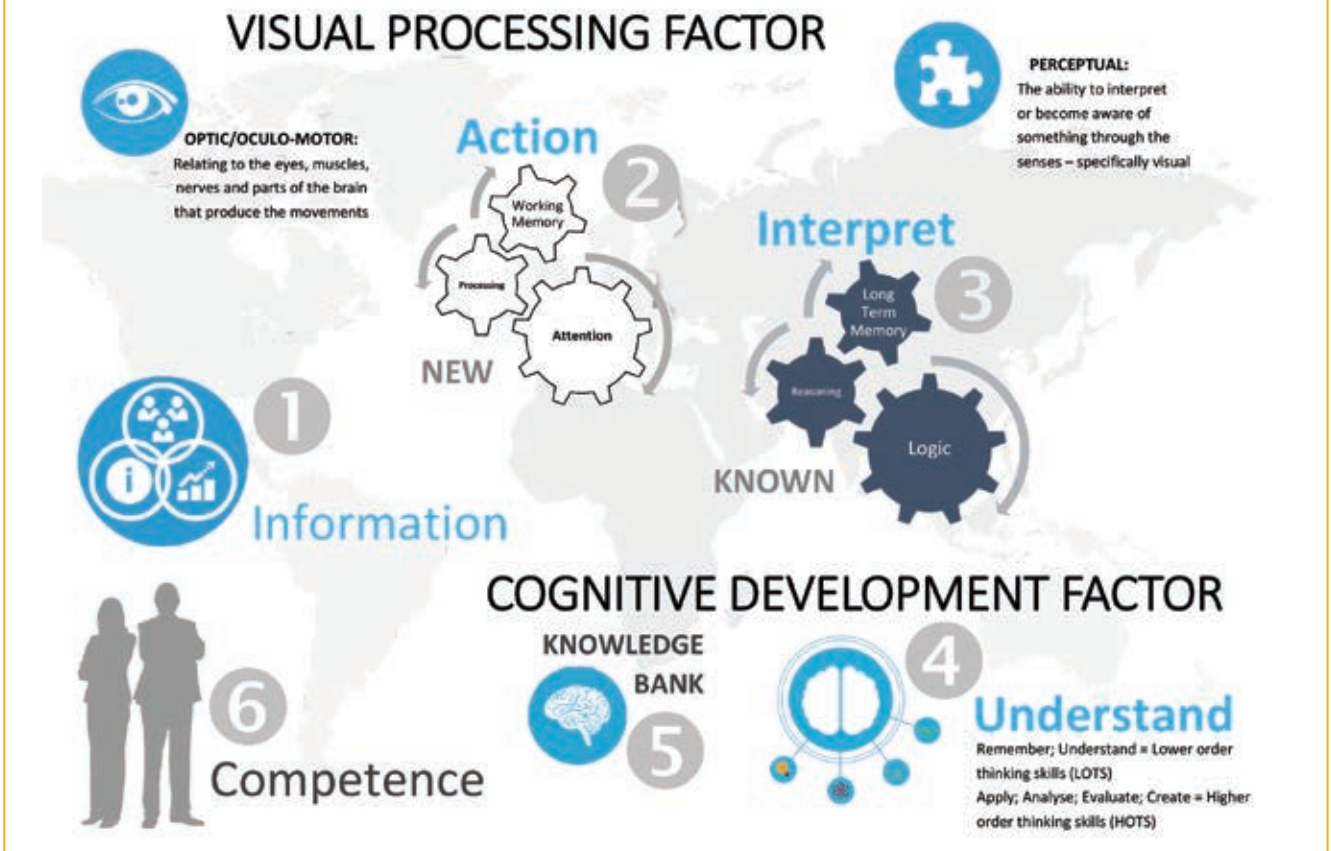
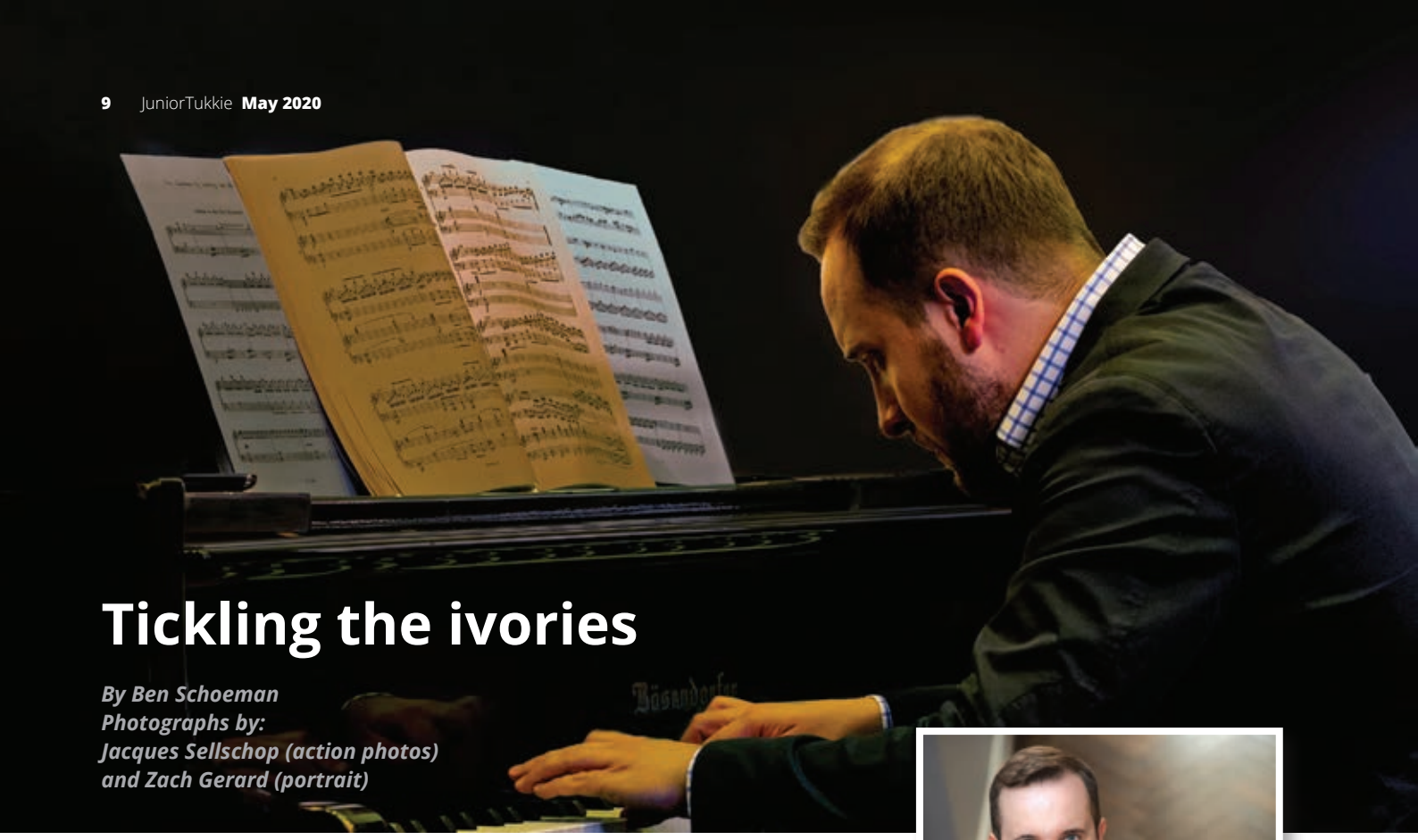
Email office@lectorsa.com
(use the reference JTAcademy2020)

The figure below indicates the EyeBrainGym process





Tickling the ivories

By Ben Schoeman
Photographs by:
Jacques Sellschop (action photos)
and Zach Gerard (portrait)

Ben Schoeman

My connection with UP started in Grade 9 when I began my piano studies under Prof Joseph Stanford. It was a privilege to be on the UP Campus and to be exposed to the Department of Music. Four years later, I became a first-year BMus student and later also completed my MMus degree at UP. I studied composition and theory under the current head of the School of Arts, Prof Alexander Johnson, who kindled my interest in a very broad range of musical styles. For me, this was an exciting and enriching time!

Where has music taken me

Once I graduated with a BMus, I moved to Italy, where for a total of nine years, I studied at the Piano Academy of Imola in Florence. The last four years I was based in London and commuted back and forth. During this time I also played many competitions that took me to new places like Tbilisi in Georgia, Glasgow and Leeds in the UK, Lisbon in Portugal and Cleveland in the USA. I am delighted to say that I am still in contact with the families who hosted me during my travels. My concert tours also allowed me to see the world and I visited countries like Romania, Bulgaria, Poland, the Czech Republic, France, Austria, Germany, Switzerland, the Netherlands and Canada. Being a musician is a unique profession that combines travel with the opportunity to learn about a range of different artistic and cultural perspectives.

The challenges in living overseas

It is a privilege to encounter so many different cultures as a musician, but it is also very hard to settle and live in foreign countries—particularly when you are unfamiliar with the language. These experiences were certainly challenges, but learning to work through them has made me stronger.

Highlights of my career

My career has had many great highlights and I am honoured to have: won 1st prizes in the UNISA International Piano Competition (Pretoria) and the Royal Over-Seas League Competition (London); played concerts at the Barbican and Southbank Centres in London; completed my doctoral studies in the UK; and been able to release several commercial recordings.

However, my most memorable experiences have been: those moments when both the audience and myself became truly immersed in the music; the wonderful lessons I learned from great teachers; and the artistic achievements of my own students. It has been a singular joy to perform with fellow South African pianist, Tessa Uys. We have played Beethoven's 9th Symphony (transcribed for piano duet by Xaver Scharwenka) on numerous occasions and will be playing all the other symphonies this year in celebration of the composer's 250th birthday.

I recommend BMus as a career choice at UP

Music is a fundamental part of every single one of us. I think that it is the most multifaceted subject of all, and studying it at UP will help you appreciate diverse cultures and open you up to many different career opportunities.

I think it is important to study what you are passionate about, and for me the excitement music brings is incomparable. The School of Arts at UP hosts an outstanding programme that opens up international horizons for students. It is a brilliant choice to study music at UP!

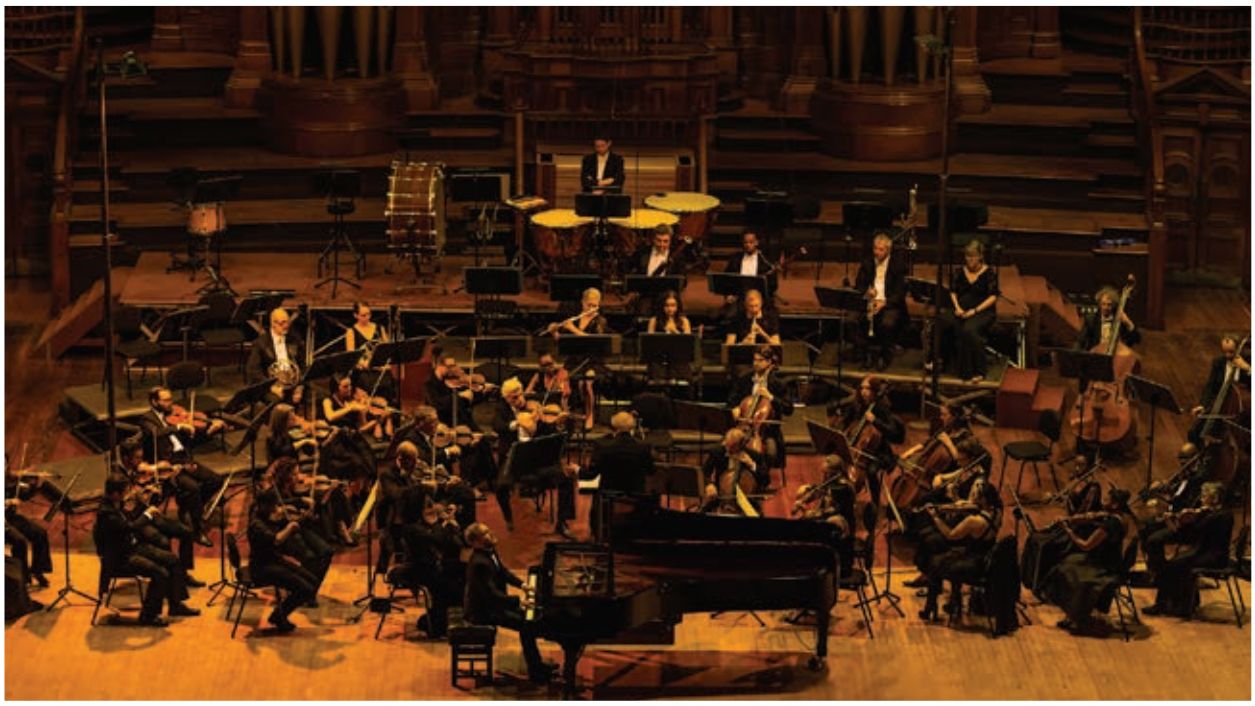
News

Barbican Centre Performance of the Ravel Piano Concerto in D for the Left Hand (1930)

On 8 November 2011 Ben Schoeman made his Barbican Hall debut, performing Ravel's Piano Concerto for the Left Hand with the Guildhall Symphony Orchestra under the baton of French conductor, Diego Masson. This was broadcast on the Euroclassical Online Music Festival.

Report by Mr Jonathan Vaughan, Director of Music —Guildhall School Music of Music and Drama
This was the most exceptional performance in every possible way. With many professors at the school, with high profile performance careers, who are reluctant to take this great work on, Ben showed enormous poise and conviction in an utterly convincing performance. The breadth of colour and intertwining lines were all the more exceptional for being generated in one hand. Indeed the power he illicited from the instrument made it difficult to believe that this was only his left hand! Sweeping lyrical lines soared above the arpeggio accompaniment and transcended all apparent technical limitations. This is one of the most exceptional performances I have witnessed at Guildhall. A triumphant Barbican debut!

Watch the performance here:
https://www.youtube.com/watch?v=Os91jWFs7E8&t=3s



Ben Schoeman creating magic accompanied by members of an orchestra

The passion of a super pianist

Do the things that make you happy because good things stem from positive energy. In a country that faces many challenges, there are still so many glorious things we can create!

Contact information
Website www.benschoeman.com
http://benschoeman.com/piano-duo

'Success is never due to one thing, but failure can be. Many things are necessary, but not sufficient for success. What are the minority of my actions that drive the majority of my results? The way to attract good luck is to be reliable in a valuable area. The more you repeatedly deliver value, the more people seek you out for that value.

Your reputation is a magnet. Once you become known for something, relevant opportunities come to you with no extra work.'

(James Clear)

News

ROARRR

IDENTITY IS EVERYTHING

By Ferdie Heunis

At ROARRR we thrive on helping people develop. Not just to become good citizens, but value-adding citizens. The future plays a big role in how I approach development. That is why we have equipped ourselves with critical development skills over the past ten years to assist those we interact with to see a better future, and enable them create it. At ROARRR we have had the opportunity to take approximately 40 000 participants through our learning engagements and we look forward to significant expansion as we pursue our vision to activate the next generation of 'identity-based leaders'.

Our relationship with the JuniorTukkie (JT) project team at the University of Pretoria is one we deeply cherish. ROARRR has been actively involved with the JT programme since 2013, where we assist the JT students in the soft skills development that is necessary for students to make a success of their tertiary studies and their future careers.

Through our 'I am a BRAND' development programme we have had the opportunity to activate the JT learners/students to identify their true potential, believe in themselves and their dreams, and to brand and market themselves effectively.

To conclude, a quote from Jordan Peterson: 'If you really want to change the world, don't try and change the world. Change yourself.' Investing in the development of the individual is of much greater value than trying to change the world—this is something that the JT movement is truly successful at.
It is a privilege to be part of a brand that truly cares for the development of the youth in our country.

Contact information
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ROARRR Visuals
Student/Leadership Development on a whole new level:
www.youtube.com/watch?v=UX9eG14oTqI&t=5s

JT Preparation Conference

News

How the library can support your teaching and learning through the **MakerSpace**

By Sean Kruger

Getting ready for your future is scary. But is that not why you come to a university? Of course, it is! The University of Pretoria, with its many faculties and professional services, strives to prepare you for your future career or business. An essential part of this is how you are taught and what you learn. In support of this, you might not think a library could help that much. However, the Department of Library Services strives to change what we do to enhance your teaching and learning experience.

One of the ways in which we develop your education is through our Library MakerSpace. What is the MakerSpace? Well, it is exactly what it sounds like: a creative lab space in which you are encouraged and equipped to make and create. The MakerSpace was one of the first of its kind in Africa and is based in the Merensky 2 Building on the Hatfield Campus.

You may be asking why a place like this is necessary? Is it cool, are there robots, or flying cars? Well, cool yes, we do have a robot, but unfortunately no flying cars yet! What we do is provide a shared space for all students to be creative by offering you access to 3D printing, 3D scanning, robotics kits, training and expertise. Making is not only about technology, but more about your skills to be creative, think beyond your field of study and be innovative. So in the MakerSpace, you can come to create things with glue guns, soldering irons, or a hammer and nail. This intends to support you in the early stages of your designs, stimulate needed technology application or to advance your skills in new domains. The idea then is to test your skills, from basic to advanced, in a non-threatening and fun environment.

In this creative laboratory, you can make and create things, learn valuable skills along the way, and even take this back to your classroom environment. The team in the space aim to inspire creators of all kinds, from the arts to engineers to assist aspiring inventors or entrepreneurs, such as yourself. We do this by providing access to tools to help make your dreams into real products or solutions. We have seen this in our space since our opening, from scanning and development of new drones to building robotic cars or sound detection devices. The challenge is up to you and we make sure you have a place to achieve this! Like we said, we may not have flying cars yet, but with leading minds such as yours, anything is possible.

The Library MakerSpace then is a hub to help you create and innovate, where you go from an idea to an actual product or service that has real value.

Think about your cellphone—someone needed to make that! In this sense, we aim to enable you as our future user, to create, innovate and impact. We hope to see you here soon during your time at the University of Pretoria.

News

Services the MakerSpace offer:

- 3D printing (as well as guidance to other additive manufacturing applications and possibilities)
- 3D scanning
- Consultation to staff, students and visitors (on technology application capabilities for advanced research as well as integration into curriculum)
- Technical training and customised workshops
- Access to basic hardware tools and glue guns, soldering irons and heat gun
- PC offerings with advanced software
- Open collaboration space
- Basic circuitry design and showcasing
- Overall space to make and create

> Curiosity, courage, and persistence are the new gatekeepers.
> (James Clear)

Students enjoying the creative MakerSpace environment

Operating hours

Monday	07:30–16:00
Tuesday	08:30–16:00
Wednesday to Friday	07:30–16:00

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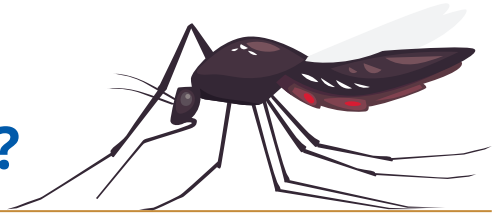
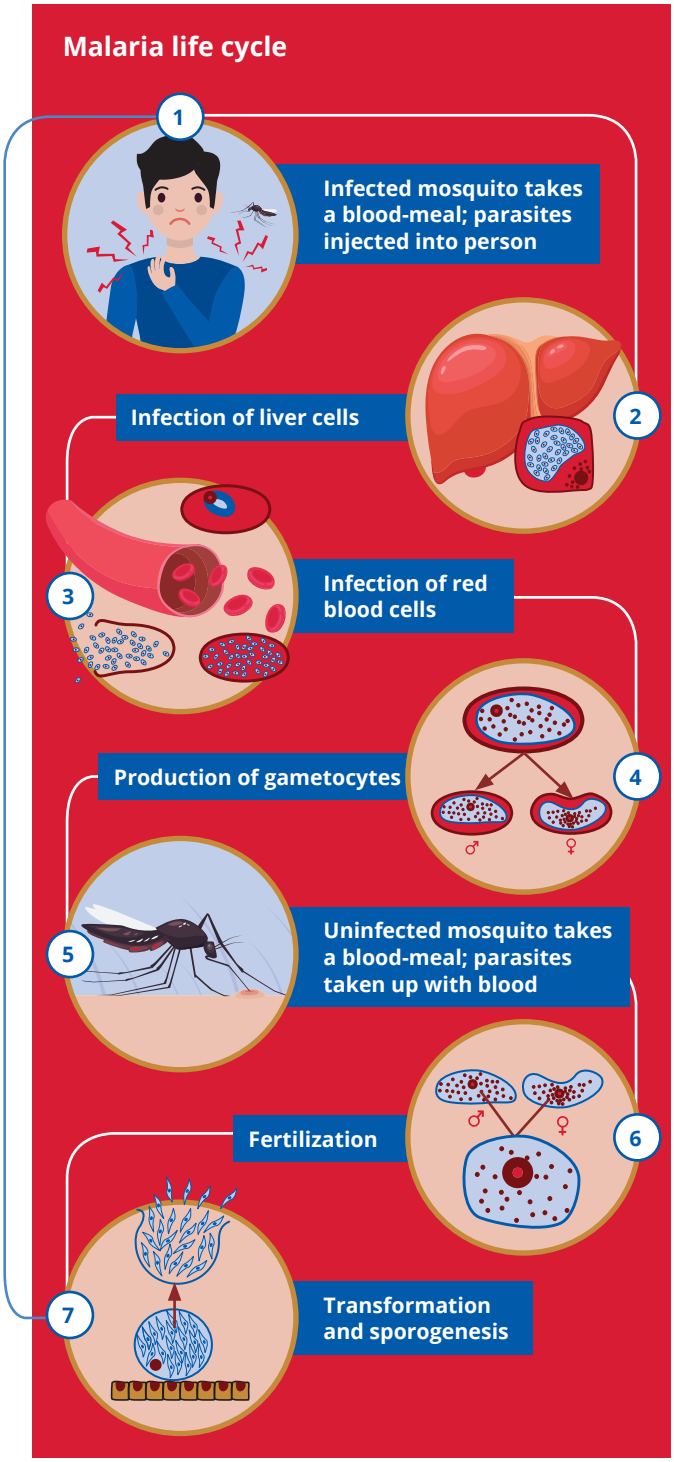
Website http://www.library.up.ac.za/makerspace/index.htm

News

MALARIA: Can we beat it?



Mosquitoes kill around 750 000 people annually. Roughly two-thirds of these deaths (405 000 in 2018, according to the WHO 2019 World Malaria Report) are due to a disease that has been around for millennia and is transmitted from human to human by a specific genus of mosquitoes. The disease is malaria.



What is malaria, and what is it caused by?

Malaria is a serious and often deadly vector-borne disease, which is both preventable and treatable. A vector is something that carries a disease from one living organism to another.

Interestingly, the name malaria comes from the words *mal* and *aria* literally meaning 'bad air' in Medieval Italian. The ancient Romans thought the disease came from the harmful fumes in swamps.

Anyone can get malaria. However, the majority of cases worldwide occur in people who live in malaria-endemic areas. The disease is caused by single-celled parasitic protozoans called *Plasmodium* that are most commonly transmitted to humans by infective female *Anopheles* mosquitoes. When an *Anopheles* mosquito bites an infected person, a small amount of blood containing the microscopic parasites is taken in. About a week later when the mosquito feeds again, the parasites are injected into a new person when bitten.

People who do not live in malaria areas can be infected when they travel to an endemic area. On the other hand, there are also two types of malaria that may occur in non-endemic areas:

- Imported malaria is when a person gets malaria in an endemic area, although symptoms and treatment occur in the non-endemic area.
- Odyssean malaria is when the mosquito travels to a non-endemic area and then bites a person. Odyssean malaria is also known as suitcase or taxi malaria.

About **3,2 billion people** globally are at risk of contracting malaria. Countries in sub-Saharan Africa account for more than 90% of malaria cases. Most deaths as a result of malaria occur in young children, under the age of five years, mostly in Africa and especially in remote rural areas. Every two minutes, a child dies of malaria.

The vector and parasite need specific humidity and temperature to be found in an area. Malaria is found in tropical and subtropical countries.

Malaria control, as recommended by the World Health Organization (WHO):

- Early diagnosis through rapid diagnostic tests (RDTs)
- Treatment through artemisinin-based combination therapies (ACTs)
- Vector control through the use of insecticide-treated nets (ITNs) or long-lasting insecticide-treated nets (LLINs), and indoor residual spraying (IRS)

News

Malaria in South Africa

Malaria is found in the north-eastern parts of Limpopo, Mpumalanga and KwaZulu-Natal Province in South Africa, especially close to the borders with our neighbouring countries Mozambique and Zimbabwe. Malaria is also found in the Kruger National Park (KNP). Roughly ten percent of South Africans (about 5,7 million people) are at risk of getting the disease.

Malaria is seasonal in South Africa and the malaria season starts from September and ends in May (wet season), with a lot less malaria cases in the other 3 months (dry season). The peak season for malaria is January and February after the first rains. However, climate change may change seasonal patterns and could impact on the occurrence of malaria. Countries like Mozambique and Zimbabwe have malaria throughout the year, with a slight dip in cases in the dryer seasons.

South Africa malaria risk map released in December 2018
Low risk *Moderate risk* *Neighbouring countries*

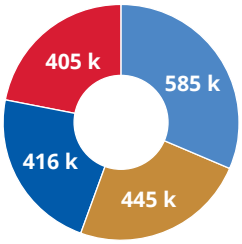
Statistics—number of cases and deaths both globally and in SA for 2010, 2016, 2017 and 2018

Globally 2010 and 2016-2018 (WHO 2019 World Malaria Report)

Estimated number of cases:

251 million
216 million
231 million
228 million

Estimated number of deaths:



Cases in Africa:

90%
91%
92%
93%

Deaths—Children under age 5:

Not provided
Not provided
61%
67%

2010 2016 2017 2018

SA 2010 and 2016-2018 (WHO 2019 World Malaria Report)

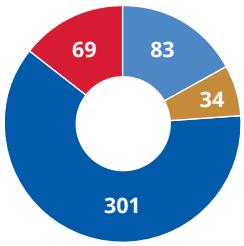
Estimated number of cases:

8 060
4 323
22 517
9 540

Imported cases:

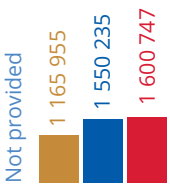
Not provided
3 075
6 234
5 742

Estimated number of deaths:



Population at risk:

People protected:

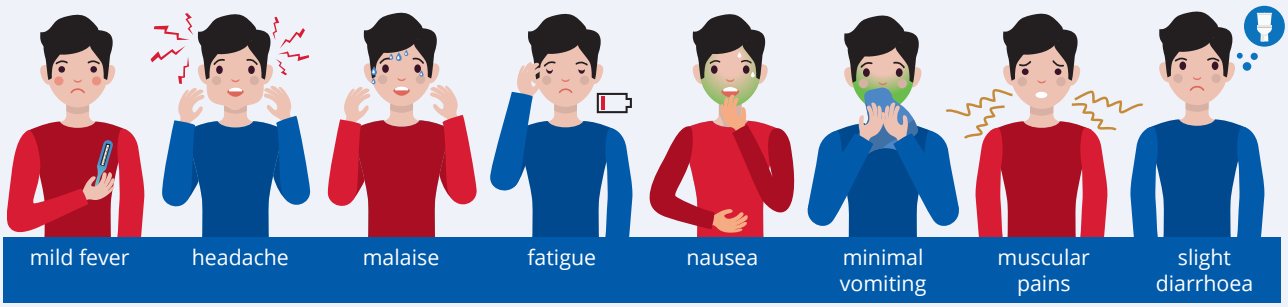


2010 2016 2017 2018

News

Symptoms, prevention and treatment

Symptoms
Malaria can be either uncomplicated or severe (complicated). The symptoms of malaria are flu-like and include:



When severe—eventually persistent coma and ultimately fatal

Symptoms can start between ten and fourteen days after being bitten, or even up to four weeks after that, depending on the type of *Plasmodium* parasite. Some malaria types can repeat.

Diagnosis is made by looking for malaria parasites in the red blood cells of a person's blood under a light microscope. For quick, cheap and easy diagnosis, rapid diagnostic tests (RDTs) are used, but the microscope method remains the best way.

Prevention
Prevention is better than cure. The 'ABC' of malaria prevention:

Be **A**ware of the risk and symptoms

Avoid mosquito **B**ites

Use **C**hemo-prophylaxis correctly

Early **D**etection of malaria

Effective and fast treatment

Ways to avoid being bitten

- Stay inside between sundown and sunrise when mosquitoes usually bite.
- Wear long-sleeved clothing if out at night.
- Try not to wear dark colours; they can attract mosquitoes.
- Use insect repellent on exposed skin.
- Stay in a well-constructed and well-maintained building.
- Use screens over windows and doors.
- Use anti-mosquito sprays or burn mosquito coils at night.
- Sleep under mosquito nets.

Use anti-malaria drugs (prophylaxis) when travelling to a malaria area. There are different types of prophylaxis and it is **VITAL** that you speak to your doctor about the best option for you.

Treatment

Malaria can be treated and cured with prescription drugs. The type of drug treatment depends on the type of malaria, known drug-resistance, infection area, severity of infection, age of the person, and personal allergies. The sooner treatment takes place, the better.

The most promising and efficient malaria treatment available is Artemisinin-based Combination Therapies (ACTs) where Artemisinin is always used with another drug.

Researchers are continually looking at new compounds and molecules that can be used for drug development. There is no malaria vaccine that is approved for human use available **YET**, but researchers are working on it.

All graphics in this article were sourced and adapted from freepik.com

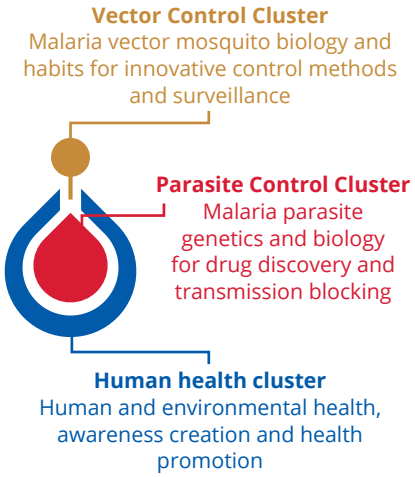
News

Malaria research and development at the University of Pretoria

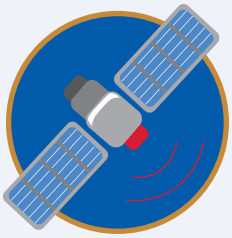
A malariologist is a specialist versed in the study, treatment or prevention of malaria. In essence, someone who studies malaria.

The University of Pretoria Institute for Sustainable Malaria Control (UP ISMC) coordinates and promotes all research in the university pertaining to malaria. The Institute encourages researchers from all over the university, each focused on a specific subject, to work together to identify safe and sustainable malaria control methods, and to produce new knowledge and support new activities towards safer malaria control in Africa.

The UP ISMC is divided into three research focus groups (clusters), namely the Human Health; Parasite Control; and Vector Control clusters, with research occurring within and between clusters. Research is also done in collaboration with other universities and research institutions around the world.



Innovative research contributions by UP ISMC researchers



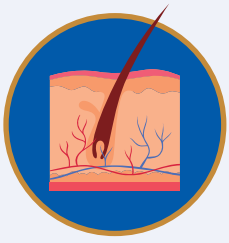
The Remote Sensing for Malaria Control in Africa (ReSMaCA) programme uses satellite technologies to aid in malaria control and malaria surveillance research.

A free mobile app, Malaria Buddy, provides malaria information, a clinic/hospital search function, and a risk-area warning travel mode. Available on both Android and iOS platforms.

Innovative ways to educate about malaria through informative books (ie Sibo Fights Malaria), educational songs, and through short drama stories and plays.

Insecticide-containing mesh to use as wall linings; repellent-containing yarn for socks, ankle guards, slap bands and shoelaces; and stronger, longer-lasting repellent formulation that can kill mosquitoes.

Kill mosquitoes on cattle by using endectocides (anti-parasitic drugs) that can be active against both endo- and ectoparasites.



Study chemical compounds found on human skin and how these contribute towards attracting or repelling mosquitoes.

Identify exploitable biochemical distinctions between parasite and human, to design novel anti-malarial chemotherapeuticals and transmission blocking drugs. Also, identify compounds in local plants for the same purpose.

UP ISMC
UNIVERSITY OF PRETORIA
INSTITUTE FOR SUSTAINABLE MALARIA CONTROL

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Twitter @UPEndMalaria **Instagram** UP End Malaria

Economic and Management Sciences

Faculty of Economic and Management Sciences
The perfect place to *Advance*

The Faculty of EMS gives a warm centenary welcome to 2020 first-year students

The Faculty of Economic and Management Sciences (EMS) proudly celebrates its 100th anniversary in 2020. The Faculty has grown from only 32 students in 1920 to being an academic home where almost 8 000 students can advance to their highest potential and make a positive contribution to society.

Faculty cultivates future leaders

Amelia Veldschoen is a final-year BCom (Supply Chain Management) student and Chairperson of Commercii, the Faculty student house. She says being an EMS student has advanced her way of thinking and her leadership capabilities by enabling her to motivate fellow students to become future leaders for a better tomorrow.

She says, 'I remember sitting in my first lecture and thinking, "Wow, there's a huge world out here and there is definitely a place for me!" I knew that I made the best decision to study in this Faculty because of the job and networking opportunities it would bring after my studies.

'My final year is quite an exciting one. The Faculty encourages students to prepare for the world of work by joining a Ready for Work programme as well as an entrepreneurship course, which offers the basics to running your own business. I was able to use those courses to open two businesses where I am able to empower people in my community by employing them and teaching them skills in events management.

Amelia (front centre) with the members of the Commercii Executive Committee

'The Faculty has definitely advanced my life since first year. Academically, having adapted to the UP way, I was able to succeed in becoming the first coloured Chairperson of Commercii, followed by becoming a golden key member—a goal I really wanted to achieve.

'So remember, it's only through continued persistence in working towards your goals that you are able to achieve them.'

Next generation of EMS students receive a warm welcome

100
1920 – 2020
Advance

The 2020 academic year started on a high as first-year students were welcomed onto the Hatfield Campus for Orientation Week. They each received a branded cap to commemorate the centenary year and the fact that they were part of such a special first-year group. They will study toward a range of nationally and internationally accredited programmes in various fields of specialisation, namely management sciences, economics, financial sciences and public administration.

Excited first-year EMS students

Economic and Management Sciences

Marketing students impress industry partner

Through the Department of Marketing's strong ties with industry, students are often challenged to put the theory they have learned during their studies into practice to solve marketing challenges for industry partners.

For a recent exam project, the students had an opportunity to gain insight and work on a realistic industry challenge when they were tasked to develop a marketing strategy to increase sales for Italtile's specific target markets. As part of the project, students also had to review the tile and bathroom ware retailer's current and past marketing strategies and conduct a competitor analysis.

Nicole Russell, Marketing Manager of Italtile (second from the left), and students from the Department of Marketing Management enjoying a cup of Craft Coffee

In conveying her appreciation for the students' exceptional contribution, Italtile Marketing Manager Nicole Russell said,

'I am so super excited to share with you some of the changes we have done to our marketing after our student presentations last year. The main "pain" we took out from last year is that our digital presence/ creative is lacking substantially. We have made some drastic changes. We have moved mountains on our digital platform creative and we have only just started. We grew by 2 800 followers (on social media) in our first week and a half—so cheers to the students—we heard you, we listened, we are most grateful.'

UP student wins 2020 Budget Speech Competition

From left: Iain Williamson, Interim CEO: Old Mutual; Dr David Masondo, Deputy Minister of Finance; Matifadza Bingudza, Budget Speech Competition winner and Mr Mike Brown, CEO: Nedbank

Matifadza Bingudza, an honours student in Investment Management at the University of Pretoria has been crowned the winner of the undergraduate category of the annual Nedbank and Old Mutual Budget Speech Competition.

Powering Africa's brightest young minds was the theme for the 48th edition of the competition, which seeks to expose economics and finance students to fiscal and economic policy planning processes. Matifadza's winning essay saw her beating nine other hopefuls from universities around the country to claim the top prize in the undergraduate category.

She will be receiving a BCom (Investment Management) degree with distinction during the 2020 UP autumn graduation and says, 'I can emphatically say that the lecturers we have at UP are world-class and uphold a level of excellence that I am extremely grateful to have been taught under. Not only are our lecturers able to cover the prescribed course content in a professional and understandable manner, but perhaps more importantly the fact that we were continuously encouraged to be cognisant of the world we live in and actively analyse, internalise and subsequently apply what we learn in class to real life. The emphasis that is placed on the ability to synthesise information and form meaningful opinions is extremely valuable—both within the competition itself and in the world of work.'

UP alumnus makes his mark abroad

Frank Wilkinson is a Human Resource Management graduate from UP and has started an exciting career as an operational consultant in the United Kingdom (UK). 'It has not been long since I left UP (December 2018) but since then, I have moved to the UK and got a graduate job at one of the most competitive companies in the UK—less than 1% of applicants are given an offer,' he says.

Testifying to how his time as an EMS student prepared him for the world of work he adds, 'UP provided a well-rounded education for me: not only was the academic preparation top tier (most of my colleagues—about 60% of them—are from Oxford and Cambridge) and I am one of the few that could compete in the applications process. The leadership and planning skills I gained during my involvement with the faculty house, Commercii, have been key to my success in the workplace. I also made friends at UP who I still talk to frequently and that network of support has also been incredibly valuable to my personal well-being.'

Frank, who was awarded the National Human Resources Management Student Excellence Award by the SA Board for People Practices (SABPP) in 2018 advises current and prospective students,

'You have a very limited time at university; I would recommend you make the most of it! Dive in head first, you can't do everything, but get involved in the things that matter to you—you don't want to look back and wonder "What if?"'

Alumnus Frank Wilkinson

Read the profiles of esteemed Faculty of EMS alumni on www.up.ac.za/ems-alumni.

Economic and Management Sciences

The Street Store@UP tackles student food insecurity

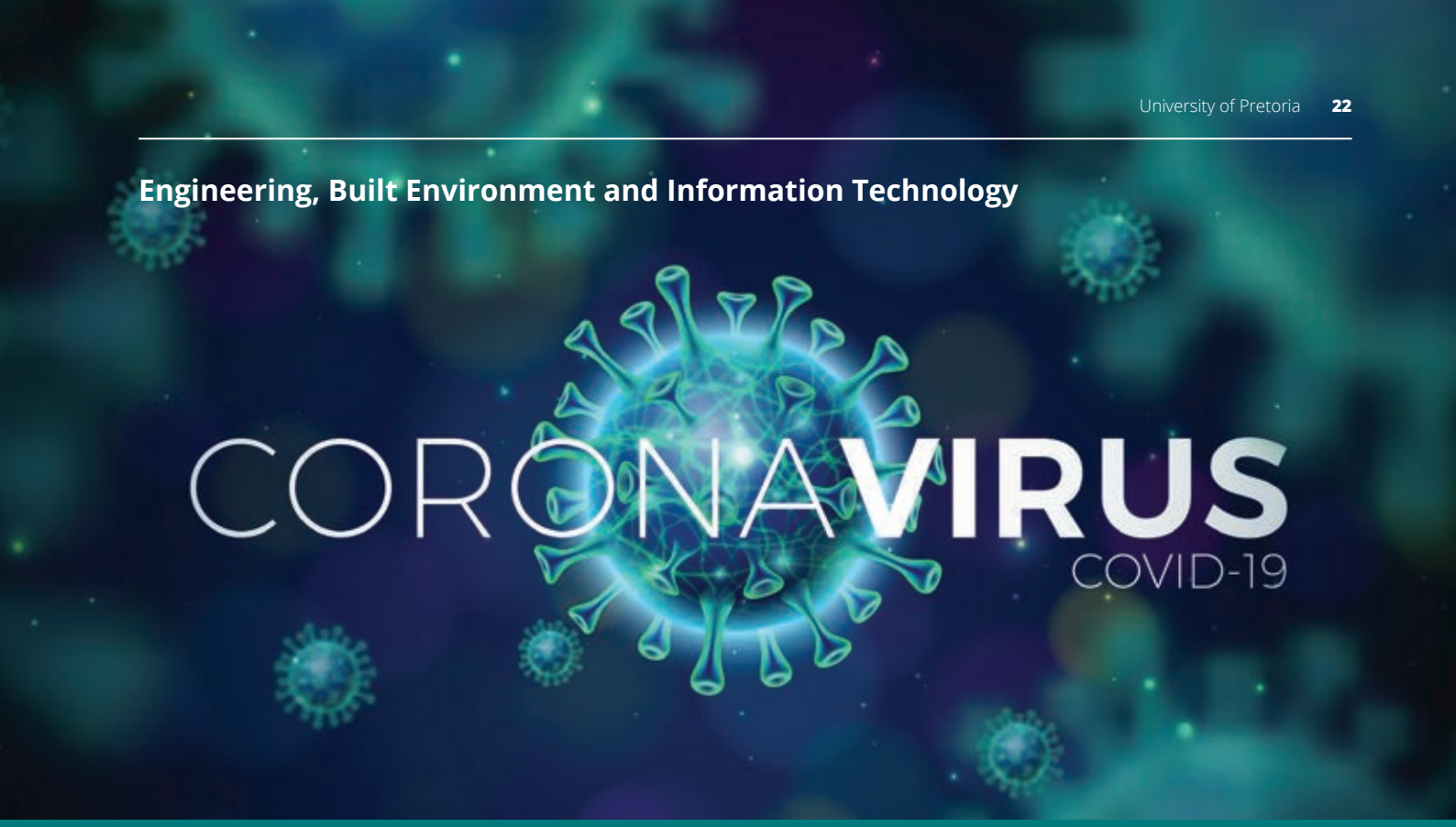
Food insecurity is a rampant challenge in the South African tertiary education environment and has a huge impact on the health, well-being and academic performance of affected students. BCom (Law) student Paseka Gaola is on a mission to make a difference by collecting necessities from the haves and donating them to the have-nots.

He explains that when he did his first year in 2018, he was very touched by the stories of his peers, as most of them were from disadvantaged families and education was the only thing that they could use to change their lives. 'Their stories were very similar to mine and it is for that reason that The Street Store@UP was formed, to help students in need with food, toiletries, and clothes,' he says.

The Street Store@UP was recently recognised in the Media24 #1000 Acts of Kindness initiative, which awards R5 000 to deserving charities, and Paseka says they were excited to receive the news, as the money is going to benefit many students and change lives. He reports that they collected more than R25 000 worth of goods—much more than the previous year—which benefited almost 30 students on a weekly basis. He concludes that the idea of having such a programme on campus presents a platform for giving and a culture of active citizenship.

Paseka Gaola with food supplies for The Street Store@UP

Engineering, Built Environment and Information Technology



UP Chemical Engineering joins the COVID-19 fray with hand sanitizers for paediatricians at SBAH

The University of Pretoria (UP) Department of Chemical Engineering in the Faculty of Engineering, Built Environment and Information Technology (EBIT) has entered the fight against COVID-19. Hand sanitizer was supplied to the doctors of the Department of Paediatrics and Child Health at Steve Biko Academic Hospital (SBAH).

Prof Izelle Smuts and Jaco-Louis Venter

With the current COVID-19 pandemic, medical care infrastructure worldwide is under immense strain. Medical supplies and equipment are in short supply and doctors are forced to make difficult decisions.

While the situation in South Africa is not yet as dire as in some other countries, medical staff are preparing for all eventualities. With limited supplies this is, however, proving quite challenging. One of the major concerns is the availability of hand sanitizer and the uncertainty on how much will be required.

The initiator of this project, Jaco-Louis Venter, a fourth-year chemical engineering student, became aware of the doctors' concern. He approached the staff of the Department of Chemical Engineering to assist and with generous donations from lecturing staff's research supplies of ethanol and glycerol, the departmental facilities were used to produce hand sanitizer following the World Health Organisation's (WHO) recommended hand rub formulation. With the assistance of Gerrie Claassen, the laboratory manager, and Franco Pretorius, a master's student at the Department and multiple contributions from the staff of the Department, they were able to produce enough hand sanitizer before the national lockdown to supply the doctors of the Department of Paediatrics and Child Health at SBAH with a bottle each.

"We appreciate the overwhelming positive response to our situation tremendously. These supplies will be of great help in the coming days," said Prof Izelle Smuts, a paediatric neurologist at SBAH. The team is currently working to acquire more supplies to continue production. The aim is to continue production for as long as possible during the pandemic.

This is an excellent example showing how, in difficult times such as these, the best of mankind is revealed and how identification of a need can be addressed by creating a team-based solution enabling those with the capacity to help where they find need.

"It is so easy to get caught up in your studies, that you forget why you chose to prepare for a specific career in the first place. I chose chemical engineering as it creates so many opportunities to contribute to our society. I am very grateful for this opportunity to do something that might actually make a real difference," Jaco-Louis said.

Should anyone like to contribute to the effort, please contact the Department at chemeng@up.ac.za.

Graphic sourced and adapted from freepik.com

Engineering, Built Environment and Information Technology

You need to know about the business incubator, TuksNovation

By Anéa Burke le Roux

TuksNovation is a technology business incubator that provides specialised support to entrepreneurs throughout their growth journeys. From access to mentorship and bespoke training by leading industry and academic experts to product prototyping facilities, TuksNovation helps young entrepreneurs navigate the journey of starting, building and growing a business. Our ecosystem fosters innovation by connecting science and technology innovators with corporates, academics and government. One of the successful start-ups that is supported by TuksNovation is FundaBotix.

FundaBotix

Ntombikayise Banda is the inspirational entrepreneur behind FundaBotix. Ntombikayise is an alumna of the University of Pretoria and a University of Cambridge PhD candidate, specialising in artificial intelligence applications in education. Drawing on her academic expertise and passion for E-STEAM education, Ntombikayise has developed low-cost robotic kits designed to teach school-going learners programming, engineering, and critical thinking skills in a fun, engaging, and tangible manner.

The robotic kits are modular in design, and easily extendible with more electronic components and sensors. Ntombikayise hopes to increase learner access and exposure to robotics and related 4th Industrial Revolution skills, particularly for neglected segments such as townships and rural areas. In early 2019, FundaBotix was successfully accepted into TuksNovation's Virtual Incubation Programme.

Ntombikayise has refined the robotic kits and has conducted a pilot with schoolchildren. TuksNovation has assisted FundaBotix with business mentorship and advisory, business model refinement as well as the rebranding of the company developing a go-to market strategy.

Ntombikayise also received business support and mentorship to help the company better position itself for funding opportunities. The mentorship bore fruits as FundaBotix was one of 20 social enterprises (out of 600 applications) to be selected as finalists for the 2019 SAB Foundation Social Innovation Awards and was awarded a Seed Grant of R200 000 to support its initiatives.

Ntombikayise cites TuksNovation as having been a pillar of strength for her and the company, as she received mentorship, networking opportunities, and access to facilities. As a result of incubation at TuksNovation, she was able to formalise and strengthen her business model, formalise her business identity, including the trademarking of FundaBotix and develop a go-to market strategy.

A key lesson that Ntombikayise highlights from her journey is realising the importance of **continuous user feedback**, an element that she says needs to be integrated in all phases of product development.

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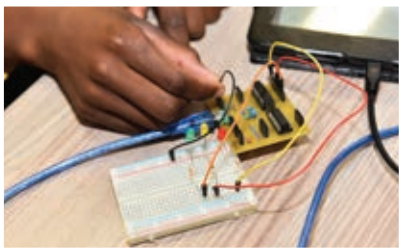
FundaBotix students learning the principles of coding through a game-based software.

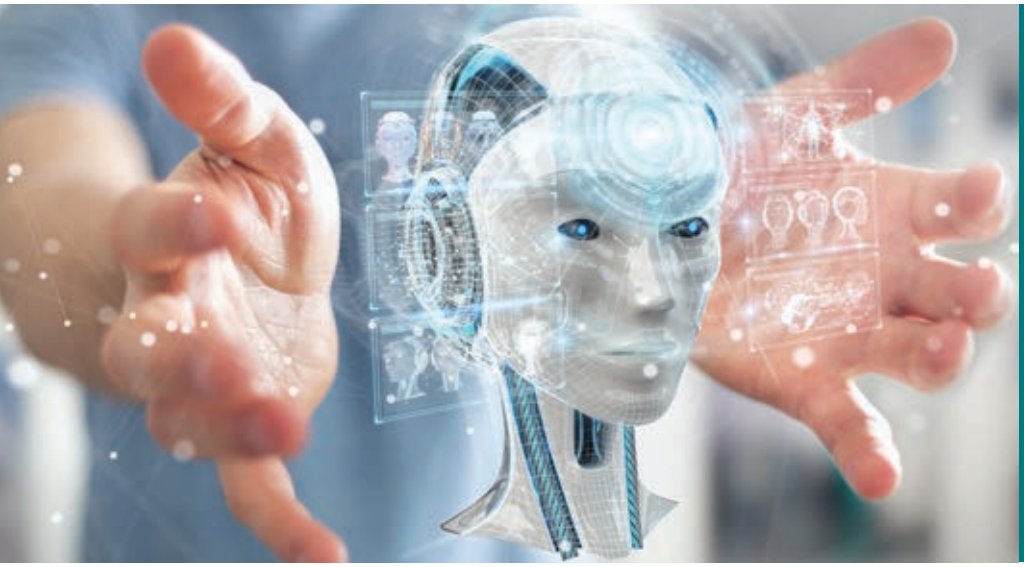


Simulating the operation of a traffic light using the FundaBotix "brain" board.

Ntombikayise and a FundaBotix learner, Somila Fanta, testing the robot that has been programmed to follow a light source (in this case, a torch).

Watch the FundaBotix video here:
https://drive.google.com/drive/folders/1-X8p-8qcTOlGBN7z_jgdOuoYRNcR0FOU?usp=sharing

Engineering, Built Environment and Information Technology



Which issues are at stake to ensure that the University of Pretoria remains relevant and competitive in the next industrial revolution?

By Prof Hanlie Smuts

Imagine it is 16 years ago. Imagine you have to explain to a friend what a selfie is, what a hashtag is or what a drone is and which jobs are relevant to these marvels? The 4th industrial revolution and digital technologies that are influencing the way we live, work and play have not only impacted existing professions, but have created new jobs as well! Therefore, the question is, how does UP stay relevant and competitive in preparing students for jobs that do not exist yet? What should we at UP do differently to give students the skills they will ultimately need for work?

Rapid changes in the commercial environment, changing industry demands, new market trends and changes in technology have a direct impact on effective learning for students and how effective they will be in the workplace. Students need to stay relevant in a market where technology, methodology (techniques and approaches to develop new systems) and industry trends change quickly. Here are three things that we focus on at UP to ensure that we achieve this outcome.

Blended learning and experience

Academic programmes are designed to present basic building blocks, create associations among the building blocks and then apply the knowledge gained through the process. This capability is demonstrated through specific projects that deliver real-world business solutions. A blended learning approach incorporates theoretical and experiential learning. It includes academic modules, critical thinking, problem-solving and enables through immersive learning experiences. A focus on virtual learning spaces in extended reality (XR) has the potential to create more engaging and personal experiences for learners than any current developments in online course design.

Think differently about skills

Rather than only focusing on mastering programme content that might be irrelevant in the near future, we enable students to also focus on learning processes where learning becomes an act of discovery. Students are coached and work as part of a team to solve specific issues or work on defined projects, developing a variety of skills.

There is a focus on understanding and examining the given problem, researching the problem background, analysing possible solutions, developing a proposal and producing a final result. During this process, students develop a greater understanding of relevant and contextual course content and skills, and the required critical thinking abilities to produce the final result. In learning processes like these, students engage in active learning that leads to mastering changing academic content.

Interdisciplinary knowledge

Interdisciplinary education merges components of two or more disciplines into a single programme around common themes, issues, or problems. This focus allows students to learn by making connections between ideas and concepts across different disciplinary boundaries. Let us think about human-computer interaction in this connected world we engage in. By exposing students to this multidisciplinary field of study focusing on the design of computer technology and, in particular, the interaction between humans (the users) and computers, they are enabled to think about this touchpoint holistically, for example placement of information, use of colour, reading strain, intuitive navigation, use of symbols, etc.

Interactions between computers and humans should be as intuitive as conversations between two humans, and interdisciplinary knowledge supports the achievement of this.

While advancements in machinery and technology first provide graduates with the tools to explore, experiment and find interesting solutions to complex problems, it will also open up a world of new career opportunities, asking for a new mix of skills. Our focus at UP is to prepare you for both of these instances.

Engineering, Built Environment and Information Technology

Learn more about the Deep Learning Indaba from Dr Vukosi Marivate

By Primarashni Gower

Dr Marivate is the ABSA Chair of Data Science at the University of Pretoria and co-founder of the Deep Learning Indaba.

Dr Marivate's background

'I hold a BSc and MSc in electrical engineering from the University of the Witwatersrand and a PhD in computer science from Rutgers University (USA), with a focus on developing machine learning/artificial intelligence methods to extract insights from data.

'What interests me is the intersection between machine learning and natural language processing.

'I run a research group called Data Science for Social Impact, and I use local challenges as a springboard for research. I have worked on projects in science, education, energy, public safety and utilities.'

What is your role as ABSA Chair of Data Science at UP?

'We expand data science practice, do interdisciplinary data science research and build the research community both within and beyond the University.'

What exactly is machine learning and data science?

'Machine learning is a subset of artificial intelligence that deals with developing machines that can learn patterns from data.

'Data science looks at using data (small and large) to better understand our world. It is multi-disciplinary because we take on challenges across numerous fields.

'Data scientists try to provide solutions to problems. We approach problems looking through the lens of data, and we find ways to use appropriate modelling (machine learning, statistics and graph mining) to tackle those problems and find solutions.'

Data science is used in multiple ways

'Data is abundant, but data also causes problems, eg when one uses data to build tools. Our team is working on methods that can make it easier to build automated tools that can process local language data for tasks such as understanding communication on chat groups, automated labelling of local language data and discovering patterns in local language texts.

'We need to better understand what factors lead to improved performance for primary and secondary school education. We use machine learning models to predict performance, but for policymakers, we have to be able to explain how these methods actually work and how they make their decisions.

'Machine learning is an interesting field of research. We need to understand issues such as cyber-safety challenges, the detection of anomalies or fraud; we need to find methods to identify threatening content online (misinformation, fake news, online harassment) and ways to prevent it too, of course.'

How much progress has South Africa made in terms of machine learning and data science, in comparison to Africa and the rest of the world?

'We have a growing community. South Africa has one of the more advanced machine learning/data science communities on the African continent, but we still have to find ways to collaborate across institutions and with industry to create a solid foundation for sustainability.'

'We do not have large university departments with plenty full-time PhD students, so we need many more students in computing and in machine learning, artificial intelligence and in data science. There are many opportunities for students interested in these fields. Through the Deep Learning Indaba, we are connected to a range of people who are doing great work in these fields.'

What advice would you give to prospective university students about this field?

'There are so many opportunities in this area, and if you keep on learning you can advance very quickly. The University has a number of opportunities for those interested in data science including a master's degree in IT in big data science.'

Contact information
Website https://dsfsi.github.io

Dr Vukosi Marivate

Engineering, Built Environment and Information Technology

What is Society 5.0 and why should young learners take note of it?

By Prof Alta van der Merwe

The concept of Society 5.0 was introduced in Japan in the 5th Science and Technology Basic Plan. The Cabinet Office of Japan (CAO, 2020) defines Society 5.0 as 'a human-centered society that balances economic advancement with the resolution of social problems by a system that highly integrates cyberspace and physical space'. Society 5.0 follows the hunting society (Society 1.0), agricultural society (Society 2.0), industrial society (Society 3.0), and information society (Society 4.0) (CAO, 2020).

Technology has entered our society on all levels and we are using different forms of technology to assist us in our daily life. There are, however, a few advantages and disadvantages in being part of Society 5.0 where technology integrates in all levels of our life through mobile technology. Society 5.0 is linked with the fourth industrial revolution (4IR), which is the current and developing environment in which disruptive technologies and trends such as the Internet of Things (IoT), robotics, virtual reality (VR), augmented reality (AR), and artificial intelligence (AI) are changing the way we socialise, live and work (Techtarget, 2019).

In Society 5.0 we are living in a society where a vast amount of information is available. The access to information creates a number of opportunities such as access to resources in the blink of an eye. However, we are also faced with the possibility of information overload or infobesity, which is where we struggle to make decisions as we have too much information pertaining to an issue. As young learners we need to understand the sources where information come from and be careful in what we use on our learning path. We also need to distinguish between information and knowledge.

Gaming developers use the immersive abilities of technologies to integrate for instance gaming in our daily life. One example is *Anki Drive*, a new-generation game that uses AI for car racing against your friends. Although these are fun activities it has also emerged as an addiction where children and young adults cannot function outside of this gaming world.

We are living in a fast-changing world—technology has many advantages and we are connected daily with our friends and our family. However, in Society 5.0 where we are so connected it is important to stay aware that although there are many opportunities, there might also be some dangers that we need to be aware of.

CAO (2020) Society 5.0, available at: https://www8.cao.go.jp/cstp/english/society5_0/index.html

Techtarget (2019) Fourth Industrial Revolution, available at: https://whatis.techtarget.com/definition/fourth-industrial-revolution

JuniorTukkie

How to become a JuniorTukkie member

Learners from Grade 9 to Grade 12 are welcome to become JuniorTukkie members.

Once registered, JT members (2020) will be invited to apply for participation in the following JuniorTukkie events. Criteria for each event will be clearly stated in the invitation:

- Preparation Conference for Grade 12 learners;
- Faculty information sessions:
  - Health Sciences (Grade 12 learners and their parents);
  - Veterinary Science (Grades 11 and 12 learners and their parents);
- Information sessions for Grade 9, 10 and 11 learners and their parents;
- 'Walk-the-Talk-with-UP' day for Grade 10 learners and parents; and
- Welcome Function for new first-year UP students.

The online JT Registration Form 2020 makes provision for you to indicate which event you're interested in attending.

The link to the JuniorTukkie Registration Form (2020) is available on the new web-based JT App. Please follow all three (3) steps below:

Step 1: Download the JT App

The JT App is now web-based, has a fresh new look and it is accessible across multiple platforms and devices.

1. **Uninstall** the previous version of the JuniorTukkie App from your device.
2. Install the new JT App (Note: The new JT App **no longer exists** in the Playstore)
3. In your web browser, type: **juniortukkieapp.co.za**
4. Click on 'Sign Up' and follow the instructions.

Step 2: Register for JT membership for the year 2020

1. On the JT App, go to 'JuniorTukkie'.
2. Click on 'Become a JuniorTukkie'.
3. The online JT Registration Form (2020) will appear on your screen.
4. Complete the form and submit.
5. You will receive an email from 'Google Forms' that will contain the information you entered on the JT Registration Form. This email serves as confirmation that you successfully registered as a JT member for the year 2020.

Step 3:

Check the JT App regularly for notifications

Important information will be sent via the Notification function on the JT App. You will be alerted when a new notification is sent. Keep an eye on the JT App for these notifications:

Should you have any queries, please send an email to the relevant JT staff member as indicated below:

JuniorTukkie membership:
themba.maluleka@up.ac.za

JuniorTukkie App:
martie.kilian@up.ac.za

Make an appointment with a Student Advisor:
carol.bosch@up.ac.za

JuniorTukkie events:
selena.davids@up.ac.za

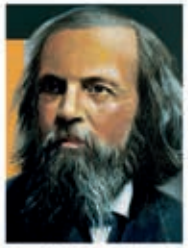
JuniorTukkie Summer School (Grade 11) and JuniorTukkie Winter School (Grade 12):
themba.maluleka@up.ac.za

JuniorTukkie Reception:
+27 (0)12 420 6606 or junior.tukkie@up.ac.za

Faculty of Natural and Agricultural Sciences

Periodic Table of the Elements

- **Pink** *(left)*: the **s** block elements (consisting: hydrogen, alkali metals, alkaline earth metals).
- **Blue** *(middle)*: the **d** block elements (they are the transition metals).
- **Yellow** *(right)*: the **p** block elements (consisting:some metals, metalloids, non-metals, noble gases, and halogens).
- **Peach** *(two rows at the bottom)*: the **f** block elements (they are the inner transition elements, consisting of actinides and lanthanides).
- **Symbols** printed in **solid black:** solids at 25˚C.
- **Symbols** printed in **white with outline:** gases at 25˚C.
- **Symbols** printed in **grey with outline:** liquids at 25˚C.



Dmitri Mendeleev

1 Ia	2 IIa	3 IIIb	4 IVb	5 Vb	6 VIb	7 VIIb	8 VIIIb	9 VIIIb	10 VIIIb	11 Ib	12 IIb	13 IIIa	14 IVa	15 Va	16 VIa	17 VIIa	18 VIIIa
1 H Hydrogen 1.0079 2.2 $1s^1$																	2 He Helium 4.0026 $1s^2$
3 Li Lithium 6.941 1.0 $[He]\ 2s^1$	4 Be Beryllium 9.0122 1.5 $[He]\ 2s^2$											5 B Boron 10.811 2.0 $[He]\ 2s^2\ 2p^1$	6 C Carbon 12.011 2.5 $[He]\ 2s^2\ 2p^2$	7 N Nitrogen 14.007 3.1 $[He]\ 2s^2\ 2p^3$	8 O Oxygen 15.999 3.5 $[He]\ 2s^2\ 2p^4$	9 F Fluorine 18.998 4.1 $[He]\ 2s^2\ 2p^5$	10 Ne Neon 20.18 $[He]\ 2s^2\ 2p^6$
11 Na Sodium 22.990 1.0 $[Ne]\ 3s^1$	12 Mg Magnesium 24.305 1.2 $[Ne]\ 3s^2$											13 Al Aluminium 26.982 1.5 $[Ne]\ 3s^2\ 3p^1$	14 Si Silicon 28.086 1.7 $[Ne]\ 3s^2\ 3p^2$	15 P Phosphorus 30.974 2.1 $[Ne]\ 3s^2\ 3p^3$	16 S Sulphur 32.066 2.4 $[Ne]\ 3s^2\ 3p^4$	17 Cl Chlorine 35.453 2.8 $[Ne]\ 3s^2\ 3p^5$	18 Ar Argon 39.948 $[Ne]\ 3s^2\ 3p^6$
19 K Potassium 39.098 0.9 $[Ar]\ 4s^1$	20 Ca Calcium 40.078 1.0 $[Ar]\ 4s^2$	21 Sc Scandium 44.956 1.2 $[Ar]\ 3d^1\ 4s^2$	22 Ti Titanium 47.88 1.3 $[Ar]\ 3d^2\ 4s^2$	23 V Vanadium 50.942 1.5 $[Ar]\ 3d^3\ 4s^2$	24 Cr Chromium 51.996 1.6 $[Ar]\ 3d^5\ 4s^1$	25 Mn Manganese 54.938 1.6 $[Ar]\ 3d^5\ 4s^2$	26 Fe Iron 55.845 1.6 $[Ar]\ 3d^6\ 4s^2$	27 Co Cobalt 58.933 1.7 $[Ar]\ 3d^7\ 4s^2$	28 Ni Nickel 58.693 1.8 $[Ar]\ 3d^8\ 4s^2$	29 Cu Copper 63.546 1.8 $[Ar]\ 3d^{10}\ 4s^1$	30 Zn Zinc 65.41 1.7 $[Ar]\ 3d^{10}\ 4s^2$	31 Ga Gallium 69.723 1.8 $[Ar]\ 3d^{10}\ 4s^2\ 4p^1$	32 Ge Germanium 72.64 2.0 $[Ar]\ 3d^{10}\ 4s^2\ 4p^2$	33 As Arsenic 74.922 2.2 $[Ar]\ 3d^{10}\ 4s^2\ 4p^3$	34 Se Selenium 78.96 2.5 $[Ar]\ 4d^{10}\ 4s^2\ 4p^4$	35 Br Bromine 79.904 2.7 $[Ar]\ 3d^{10}\ 4s^2\ 4p^5$	36 Kr Krypton 83.8 $[Ar]\ 3d^{10}\ 4s^2\ 4p^6$
37 Rb Rubidium 85.468 0.9 $[Kr]\ 5s^1$	38 Sr Strontium 87.62 1.0 $[Kr]\ 5s^2$	39 Y Yttrium 88.906 1.1 $[Kr]\ 4d^1\ 5s^2$	40 Zr Zirconium 91.2245 1.2 $[Kr]\ 4d^2\ 5s^2$	41 Nb Niobium 92.906 1.2 $[Kr]\ 4d^4\ 5s^1$	42 Mo Molybdenum 95.94 1.3 $[Kr]\ 4d^5\ 5s^1$	43 Tc Technetium 98.906 1.4 $[Kr]\ 4d^5\ 5s^1$	44 Ru Ruthenium 101.07 1.4 $[Kr]\ 4d^7\ 5s^1$	45 Rh Rhodium 102.91 1.5 $[Kr]\ 4d^8\ 5s^1$	46 Pd Palladium 106.42 1.4 $[Kr]\ 4d^{10}$	47 Ag Silver 107.87 1.4 $[Kr]\ 4d^{10}\ 5s^1$	48 Cd Cadmium 112.41 1.5 $[Kr]\ 4d^{10}\ 5s^2$	49 In Indium 114.82 1.5 $[Kr]\ 4d^{10}5s^2\ 5p^1$	50 Sn Tin 118.71 1.7 $[Kr]\ 4d^{10}5s^2\ 5p^2$	51 Sb Antimony 121.76 1.8 $[Kr]\ 4d^{10}\ 5s^2\ 5p^3$	52 Te Tellurium 127.6 2.0 $[Kr]\ 4d^{10}\ 5s^2\ 5p^4$	53 I Iodine 126.904 2.2 $[Kr]\ 4d^{10}\ 5s^2\ 5p^5$	54 Xe Xenon 131.29 $[Kr]\ 4d^{10}\ 5s^2\ 5p^6$
55 Cs Caesium 132.91 0.9 $[Xe]\ 6s^1$	56 Ba Barium 137.33 1.0 $[Xe]\ 6s^2$	57 La Lanthanum 138.91 1.1 $[Xe]\ 5d^1\ 6s^1$	72 Hf Hafnium 178.49 1.2 $[Xe]\ 4f^{14}\ 5d^2\ 6s^2$	73 Ta Tantalum 180.95 1.3 $[Xe]\ 4f^{14}\ 5d^3\ 6s^2$	74 W Tungsten 183.84 1.4 $[Xe]\ 4f^{14}\ 5d^4\ 6s^2$	75 Re Rhenium 186.21 1.5 $[Xe]\ 4f^{14}\ 5d^5\ 6s^2$	76 Os Osmium 190.23 1.5 $[Xe]\ 4f^{14}\ 5d^6\ 6s^2$	77 Ir Iridium 192.22 1.6 $[Xe]\ 4f^{14}\ 5d^7\ 6s^2$	78 Pt Platinum 195.08 1.4 $[Xe]\ 4f^{14}\ 5d^9\ 6s^1$	79 Au Gold 196.97 1.4 $[Xe]\ 4f^{14}\ 5d^{10}\ 6s^1$	80 Hg Mercury 200.59 1.5 $[Xe]\ 4f^{14}\ 5d^{10}\ 6s^2$	81 Tl Thallium 204.38 1.4 $[Xe]\ 4f^{14}5d^{10}6s^2 6p^1$	82 Pb Lead 207.20 1.6 $[Xe]\ 4f^{14}5d^{10}6s^2 6p^2$	83 Bi Bismuth 208.98 1.7 $[Xe]4f^{14}5d^{10}6s^2 6p^3$	84 Po Polonium 208.98 1.8 $[Xe]\ 4f^{14}5d^{10}6s^2 6p^4$	85 At Astatine 210 2.0 $[Xe]\ 4f^{14}5d^{10}6s^2 6p^5$	86 Rn Radon 222.02 $[Xe]\ 4f^{14}5d^{10}6s^2 6p^6$
87 Fr Francium 223.02 0.9 $[Rn]\ 7s^1$	88 Ra Radium 226.03 1.0 $[Rn]\ 7s^2$	89 Ac Actinium 227.03 1.0 $[Rn]6d^1 7s^2$	104 Rf Rutherfordium 261.11	105 Db Dubnium 262.11	106 Sg Seaborgium 266	107 Bh Bohrium 264	108 Hs Hassium 277	109 Mt Meitnerium 268	110 Ds Darmstadtium 271	111 Rg Roentgenium 272	112 Cn Copernicium 285	113 Nh Nihonium 286	114 Fl Flerovium 289	115 Mc Moscovium 289	116 Lv Livermorium 293	117 Ts Tennesine 294	118 Og Organesson 294

58 Ce Cerium 140.12 1.1 $[Xe]\ 4f^1\ 6s^2$	59 Pr Praseodymium 140.91 1.1 $[Xe]\ 4f^3\ 6s^2$	60 Nd Neodymium 144.24 1.1 $[Xe]\ 4f^4\ 6s^2$	61 Pm Promethium 146.92 1.1 $[Xe]\ 4f^5\ 6s^2$	62 Sm Samarium 150.36 1.1 $[Xe]\ 4f^6\ 6s^2$	63 Eu Europium 151.96 1.0 $[Xe]\ 4f^7\ 6s^2$	64 Gd Gadolinium 157.25 1.1 $[Xe]\ 4f^7\ 5d^1\ 6s^2$	65 Tb Terbium 158.93 1.1 $[Xe]\ 4f^9\ 6s^2$	66 Dy Dysprosium 162.50 1.1 $[Xe]\ 4f^{10}\ 6s^2$	67 Ho Holmium 164.93 1.1 $[Xe]\ 4f^{11}\ 6s^2$	68 Er Erbium 167.26 1.1 $[Xe]\ 4f^{12}\ 6s^2$	69 Tm Thulium 168.93 1.1 $[Xe]\ 4f^{13}\ 6s^2$	70 Yb Ytterbium 173.04 1.1 $[Xe]\ 4f^{14}\ 6s^2$	71 Lu Lutetium 174.97 1.1 $[Xe]\ 4f^{14}\ 5d^1\ 6s^2$
90 Th Thorium 232.04 1.1 $[Rn]\ 6d^2\ 7s^2$	91 Pa Protactinium 231.04 1.1 $[Rn]\ 5f^2\ 6d^1\ 7s^2$	92 U Uranium 238.03 1.2 $[Rn]\ 5f^3\ 6d^1\ 7s^2$	93 Np Neptunium 237.05 1.2 $[Rn]\ 5f^4\ 6d^1\ 7s^2$	94 Pu Plutonium 244.08 1.2 $[Rn]\ 5f^6\ 7s^2$	95 Am Americium 244.06 1.2 $[Rn]\ 5f^7\ 7s^2$	96 Cm Curium 247.07 1.2 $[Rn]\ 5f^7\ 6d^1\ 7s^2$	97 Bk Berkelium 247.07 1.2 $[Rn]\ 5f^9\ 7s^2$	98 Cf Californium 251.08 1.2 $[Rn]\ 5f^{10}\ 7s^2$	99 Es Einsteinium 252.08 1.2 $[Rn]\ 5f^{11}\ 7s^2$	100 Fm Fermium 257.10 1.2 $[Rn]\ 5f^{12}\ 7s^2$	101 Md Mendelevium 258.10 1.2 $[Rn]\ 5f^{13}\ 7s^2$	102 No Nobelium 259 $[Rn]\ 5f^{14}\ 7s^2$	103 Lr Lawrencium 262.11 $[Rn]\ 5f^{14}\ 6d^1\ 7s^2$

Atomic number → 88
Symbol → Ra
Element name → Radium
Atomic mass → 226.03
Electronegativity → 1.0
Electron configuration → $[Rn]\ 7s^2$

For more information please visit our website at www.up.ac.za/nas

Engineering, Built Environment and Information Technology

Is it possible to be a millionaire in South Africa at the age of 22? Ask Albert van Wyk

By Anthea Pretorius

Albert van Wyk is a self-made millionaire. He obtained a degree in industrial engineering at the University of Pretoria in 2015. Today at the age of 27, he is an entrepreneur, author and motivational speaker. His main ventures include his investment properties and his business, Gazzaroo.

Albert van Wyk

Albert's passion is to empower the youth of South Africa to become financially independent so that they can also make their dreams a reality. He achieved financial independence through his qualification, entrepreneurship and by presenting talks and courses at schools and universities across South Africa. He posts regular, exciting and helpful content on social media and sells his book *How to Become a Millionaire at 22,* which includes tips and tools he has used to create a successful financial future.

Growing up years

'I didn't grow up in a wealthy family. We couldn't afford the toys my friends had and I didn't receive pocket money. We relied on second-hand clothes and toys. There were many months that we battled to make ends meet. I dreamed of owning the things that others in our neighbourhood enjoyed. Both my parents believed in personal development and in chasing one's dreams. My mom and dad encouraged me to develop myself. One way, was to read many books. They were very supportive.

I started reading a lot of business books and then, in an effort to start earning pocket money to buy toys for myself, I started selling plastic "Scooby-Doo" strings at school. This turned into a toy store at school. After school I would mow lawns, wash cars and clean rooms for people in our neighbourhood. In high school I sold all kinds of things, from phones and laptops to play stations. Eventually I started buying and selling cars; I also got involved in construction projects. I used these businesses and the money I had saved up by then to buy my first property at the age of nineteen. I matriculated in 2011 from HTS John Vorster.'

How did you go about choosing a university and a degree programme?

'I wanted to study a recognised profession that was valued in society. I chose engineering instead of law or medicine. Industrial engineering was the best option, as I had a chance to learn about both engineering and business. To me it was the best of both worlds.'

Did any family members study at the University of Pretoria (UP) and did they encourage you to consider UP?

'No, none of my family members had the opportunity to attend university, so it was understandably important for my parents that I should go to university and obtain a degree. I was the first person in the Van Wyk family to complete a degree and the first to become an engineer.'

What challenges have you faced in your life that you would be willing to share with our JT readers?

'I faced many challenges, but I don't see them as challenges or failures. I didn't grow up in wealthy circumstances, which for some, might be a challenge. I lost R180k on a car sale that went wrong when I was 20 years old, which might be considered a failure. I lost R1 million on a property deal, which to many, would be a big loss. But I don't see it that way. Challenges are a part of daily life and the journey towards entrepreneurial freedom. Some challenges are bigger than others and some results are different from what I expected. That's all it is. Challenges enable you to figure out the right recipe that you can apply in your life. When you don't get the desired result, you change the recipe and then you try again. I constantly adapt my recipe for success.'

What opportunities have you had that had a profound effect on you and your decisions?

'I believe we create opportunities. The universe presents us with opportunities when we are ready for them.

Opportunities are ALWAYS there. We just don't see them, or can't leverage them if we are not ready. Once we are adequately prepared and have put in the hard work required, the opportunities become clear to us. We can then use our experience and skills to make the opportunities work for us. The "perfect opportunity" will never present itself to you if you are not in the optimal position to make it work. There's never a perfect time, business partner, economy, government or opportunity to start a business or to make money. You need to MAKE it happen. Work hard, educate yourself, change your mindset and put in the effort every day. What other people define as "opportunities," will just be a part of the process for you.'

Where did the concept of entrepreneurship grab your attention and how has it developed over the course of your life until now?

'When I couldn't get the toys and other possessions my friends had in primary school, I started asking my dad why we couldn't afford the things people around us had. His answer changed everything for me. He said: "If you want to become a millionaire, you need to learn from a millionaire." I started reading my first business book. I became acquainted with the concept of entrepreneurship:

Engineering, Built Environment and Information Technology

"It doesn't matter where you start or where you come from, you can create your own success."

'This was an amazing revelation, because we all start the race in life at different places. Some start the race before others. That's just life. The concept of entrepreneurship levels the playing field and makes it possible for anyone to reach the top, no matter where you start or when you start. I started the race far behind many others, but when I started I gave it everything. I believe that entrepreneurship and being financially independent is the only way to survive the economic climate going forward into the future.'

How did you go about making your first million?

'I used the money from all my small businesses as a big deposit and, together with a bank loan, I bought my first property at the age of nineteen. I ran the house as a commune for four years until it was a paid off asset worth R1.3 million.'

What is your dream job?

'Exactly what I am currently doing. I don't have a job, but I do have multiple endeavours. I am an investor, business owner and "impact-maker" in South Africa. I am making a difference in our country and I am financially independent. This allows me to fund things that matter to me and it enables me to live my dream. I am dreaming with my eyes wide open.'

What difference do you believe you can make in the world?

'I believe that I can help the youth in South Africa to become financially independent. By doing this, they can also make their dreams come true and in turn can make a massive difference in the world themselves. Imagine if all Grade 12 learners in South Africa had no financial or time constraints; they would become sport stars, artists, entrepreneurs, doctors, engineers, inventors and the list goes on! They would be able to change the world as we know it, completely. I managed to find a way to start from the bottom and I have become financially independent, I travel the country and share this knowledge with the youth so that they can do the same with their dreams.'

Other interesting things about Albert

'I go to the gym every day and will go to the driving range every now and then. I am a massive Formula One fan! I hope to start my own kart racing team soon. I love Marvel and DC comics and collect the fine art statues. I love dinosaurs and own a collection of them.

'I wear slip slops to the office and I love my long hair. I am currently studying Spanish. I play the guitar and drums. My guilty pleasure is coffee with chocolate late at night and I like pineapple on pizza.'

My last words of inspiration to readers

'It is possible to make your dreams come true no matter where you start or find yourself at this stage of your life. It is possible to start small and end up with more than one successful business and a property portfolio. I have done it and so can you. The motto I live by is: MAKE it happen! Don't wait for the perfect opportunity, economy, friends, family, government, country, business partner or anything else. I am taking what I currently have and just make it happen through hard work, drive, dedication and energy. All my profits go to financial education and entrepreneurship empowerment for the youth in South Africa.'

Contact information

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Facebook	@millionaireat22
Instagram	@millionaireat22
YouTube	@millionaireat22

Albert sharing his story

Albert giving a motivational talk at a school

Health Sciences

CPR competition brings teaching and learning to life

By Mmane Boikanyo

Representatives of ZOLL Medical Corporation with the Faculty of Health Sciences staff

The Undergraduate and Surgical Skills Centre, in partnership with ZOLL Medical Corporation, hosted the 2020 CPR Competition on 26 February 2020. The competition took place at the Faculty of Health Sciences in the foyer of the HW Snyman Building on the Prinshof Campus. Undergraduate students from different disciplines entered teams to participate in the competition.

Deputy Dean of Teaching and Learning, Professor Vanessa Steenkamp, touched on the importance of the annual event: 'This is an exciting example of how technology can transform teaching and learning practice. It provides us with a tool to entrench the skills required for the place of work. Additionally, this allows for students from different disciplines to engage, resembling a real-life scenario.'

The competition makes teaching and learning visible and provides students with an opportunity to practise assimilation-based cases with a strong emphasis on reality. They gain real-life experience of something that they would traditionally watch on video or practice in a lab. Students had to deal with additional pressures, such as time management. After each scenario, student teams received feedback. They were given another opportunity to apply what they had learnt in the scenario.

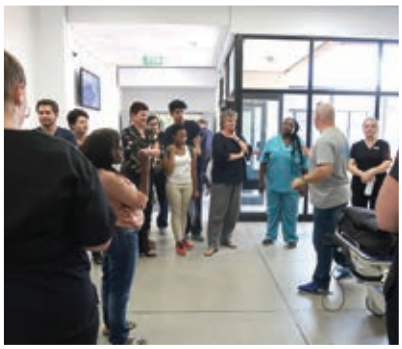
Students embraced the opportunity to put what they have learnt in the lecture rooms into practice. Third-year MBChB student Nicole Nesser used the opportunity to improve her techniques for conducting CPR. 'It was a great experience for me. I was doing CPR, but didn't know that I could improve my skill. The instructor, real-life scenario and machines helped me realise what I can improve to become a better doctor in future.'

The CPR competition was sponsored by ZOLL Medical Corporation, a company that develops and markets medical devices and software solutions that help to advance emergency care and save lives. 'The University of Pretoria is an ideal partner because it is about data, science and innovation. The assimilated scenarios use technology to make a big difference to patients by increasing clinical and operational efficiencies, which leads to a second chance in life,' said Munther Hassan, who is the Senior Regional Manager (Middle East and Africa) at ZOLL Medical Corporation.

This is surely to be an event that will be repeated!

Contact information
Switchboard +27 (0)12 319 2911
Email healthapplications@up.ac.za

The CPR practice doll



Attentive students being shown the process

Health Sciences

Pioneering research by University of Pretoria and University of Leicester revolutionises early detection of TB

By Masego Panyane

Researchers at the University of Pretoria (UP) and the University of Leicester are revolutionising the way tuberculosis (TB) is detected through the invention and application of a 3D-printed insert added to simple face masks. This new approach has the potential to detect millions of currently missed infections across the world.

Designed and printed at Leicester University, the inserts reliably catch and retain live tuberculosis bacteria after people who may be infected have worn the adapted mask for just 30 minutes. This is the first time that exhalation from prospective patients with TB can be captured in such a quick and simple way.

Unlike a blood test, which cannot differentiate between active and quiescent TB, the masks provide rapid detection of captured bacteria, offering a more direct potential indicator of how infectious individuals are compared to traditional sputum samples; they also reduce the need for invasive investigation.

The TB bacterium globally causes more deaths due to infection than any other microbe. According to the World Health Organization, 301 000 people in South Africa fell ill with TB and 64 000 died from it in 2018. TB newly affects 10 million people worldwide, every year.

Professor Anton Stoltz, Head of Department in the Division of Infectious Diseases at UP, said this finding is particularly important because it makes early detection of TB easier and faster. 'This is a potentially universal solution that can also benefit underprivileged communities, who still struggle with accessing health care. In South Africa, when it comes to the treatment of TB, we speak of the "missing millions". These are the people that have TB, but aren't aware and are not diagnosed. As a result, health care professionals can't get to them. With this new method, we'll be able to test a lot more people, even those not exhibiting symptoms of the disease, and get them treated early. This way, we'll be able to save more lives, because early detection saves lives.'

Prof Stoltz said his working relationship with the University of Leicester came about through a chance meeting between himself and Professor Mike Barer.

'Professor Barer and I met a few years ago. There was a call for scientists from the UK and South Africa to come together, work out a plan, and do some research together. From that first meeting, we started talking about what we want to do in South Africa. This is the first article that has been published, and there will be different things that we will publish in the future,' he said. 'I have been working for 10 years on TB and aerobiology. I am grateful to have been a part of this team; I think we gel well together, and I am excited about the work that we will continue to produce.'

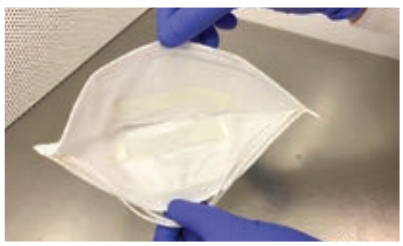
Prof Stoltz said future research would include studying TB in communities, as well as diagnosing TB in children, as these are the areas that are still a challenge to health care professionals and scientists.

The University of Leicester's Professor Mike Barer said, 'The fact that the mask is a low-cost and sensitive way to detect TB before it appears in sputum has huge implications for early detection of the disease and patients having earlier access to treatment. We are really excited about how we can take this forward and influence the spread of airborne infection.'

One of the most common symptoms of the disease is a persistent cough with phlegm. TB is usually diagnosed with a blood test, chest x-ray, phlegm sample and in some cases a bronchoscopy. Often when these symptoms present, the infection has already been in the body for months, and the person may have infected many others.

The findings, published online on The Lancet website on 18 February 2020, have the potential to revolutionise the opportunity for early detection and prevention of the disease.

UP researchers worked in conjunction with a research team at the University of Leicester, initially sampling 24 people with confirmed TB over a 24-hour period, which showed that infectious TB was exhaled and spread when



The face masks have been fitted with a 3D-printed insert.

patients were asleep—a breakthrough in our understanding of the disease, demonstrating that a cough may not be required to spread the infection.

The trial showed 86.5% of the patients testing positive for TB through the use of the mask, and only 20.5% from sputum—despite all patients being positively tested for TB through sputum at the start, demonstrating the reliability of the mask for achieving consistent results.

In addition, in a further trial of 20 patients with TB symptoms, four patients with negative sputum tested positive with the mask, and the presence of TB was only detected in their sputum six weeks later—demonstrating the accuracy of the test and highlighting the potential for early diagnosis.

UP Vice-Chancellor and Principal Professor Tawana Kupe said he is excited that UP researchers are once again at the forefront of producing research that will make a meaningful impact. 'The University of Pretoria leads when it comes to producing research that will have an impact on the lives of people on the continent, and indeed around the world,' he said. 'UP is committed to increasing our international collaborations in pursuit of solutions to Africa and the world's myriad challenges, and I applaud both our Professor Anton Stoltz and the University of Leicester's Professor Mike Barer on leading their teams in this successful partnership. We are confident that these findings will ultimately bring the world an important step closer to beating the scourge of TB.'

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Humanities

Being human!

Studying speech-language pathology and audiology

By Palesa Mbonde

What do anthropology, history, sociology, political sciences, languages and the arts have in common? The answer: These disciplines study the human condition, society and culture, focusing on how we process and document our human experience.

The Department of Speech-Language Pathology and Audiology at the University of Pretoria is no different. Formed in 1960 as Speech-Pathology and Audiology, the Department evolved to include courses that study the growing number of communication disorders that affect our speech, voice, and ability to use language.

Being able to communicate with others is an important element of our human experience—our families and friends tell us stories and everyone conveys information using a range of channels. It is the job of a speech-language therapist to help us prevent, diagnose, habilitate and rehabilitate our physical ability to communicate.

It is equally important to be able to hear what is being said to us, and this is what an audiologist studies. An audiologist is another scarce skill and the career promotes healthy hearing and a better quality of life for people of all ages. If you choose to become an audiologist, you will learn to identify, prevent, and rehabilitate hearing, balance and other related auditory functions.

So, how do you become a speech-language therapist or an audiologist?

What are the minimum admission requirements?

SELECTION PROGRAMMES					
Programmes	**Minimum requirements for 2021***				
	Achievement level				**APS**
SPEECH-LANGUAGE PATHOLOGY AND AUDIOLOGY	**Mathematics**		**English Home Language or English First Additional Language**		
	NSC/IEB	AS Level	NSC/IEB	AS Level	
BA (Speech-Language Pathology) [4 years] Closing dates: SA – 30 June Non-SA – 30 June	5	C	5	C	**32**
Selection is based on academic achievement and only 50 students are admitted. To retain admission, you must obtain an APS of at least 32 in the NSC. The conditional selection process starts in July each year. For more information, please contact the programme coordinator (see page 7). For the Audiology and Speech-Language Pathology programme, the first study year is the same and **the NBT is not required**. **Note:** We will consider both first- and second-choice applications for BA (Speech-Language Pathology). **Careers:** Work in education and special education, hospitals, clinics or rural communities, or in private practices, government, military and academic institutions (teaching and research)					
BA (Audiology) [4 years] Closing dates: SA – 30 June Non-SA – 30 June	5	C	5	C	**32**
Selection is based on academic achievement and only 50 students are admitted. To retain admission, you must obtain an APS of at least 32 in the NSC. The conditional selection process starts in July each year. For more information, please contact the programme coordinator (see page 7). For the Audiology, and Speech-Language Pathology programmes, the first study year is the same and **the NBT is not required**. **Note:** We will consider both first- and second-choice applications for BA (Audiology). **Careers:** Diagnostic and rehabilitative audiology, audiometry and hearing therapy, work in education, special education, hospitals, clinics, private practice or government, military and academic institutions (teaching, research) and industry					

* Cambridge A Level candidates who obtained at least a D in the required subjects and International Baccalaureate (IB) HL candidates who achieved at least a 4 in the required subjects will be considered for admission.

To be admitted to BA (Speech-Language Pathology), you need to apply as soon as applications open on **1 March**. Applications are open to Grade 11 applicants who acquired an Admission Point Score (APS) of 30 (excluding Life Orientation) and your final Grade 11 results will be used to offer you **conditional** acceptance. Once you receive conditional acceptance, you will need to maintain and try to exceed the initial APS.

Please remember: *Admission to these selection programmes are numbers limited. For this reason prospective students may not obtain a place despite meeting the minimum admission requirements.*

Humanities

What can I do with this degree?

A degree in speech-language pathology and audiology does not only focus on therapeutic skills training. The degree is also aimed at gaining an understanding of human interaction by studying speech, language development, speech disorders, normal hearing, speech acoustics, and hearing impediments. Students enrolled in this programme can become speech-language therapists and will assist patients to overcome or reduce communication disorders.

Should you wish to become an audiologist, you will learn, among other things, to diagnose hearing impairments, promote therapy for patients with hearing disorders and fit hearing aids. Speech-language pathology and audiology practitioners have scarce skills and typically work in education and special education institutions, hospitals, clinics, in rural communities or in private practices.

What does the degree entail?

BA (Speech-Language Pathology) and BA (Audiology) degrees are 511 credit courses. The courses cover modules including Anatomy, Physiology, Medical Terminology, and Psychology, among many others. But at UP, speech-language pathology and audiology programmes also bring a humanistic perspective to communication challenges, which are often addressed only through medical processes.

Which subjects do we learn in this programme?

The BA (Speech-Language Pathology) programme requires four years of full-time study and combines practical experience with studying fundamental theoretical components. Students are trained to identify possible causes and symptoms of speech, voice and language disorders, and appreciate the intervention and therapeutic techniques for improving speech, language and voice.

When you join this Department, you join the growing number of superheroes who address the processes and disorders of human communication. Speech-language therapists and audiologists are also affiliated to the Centre for Augmentative and Alternative Communication.

If your desire is to be a speech-language pathologist or an audiologist, UP is the best choice!

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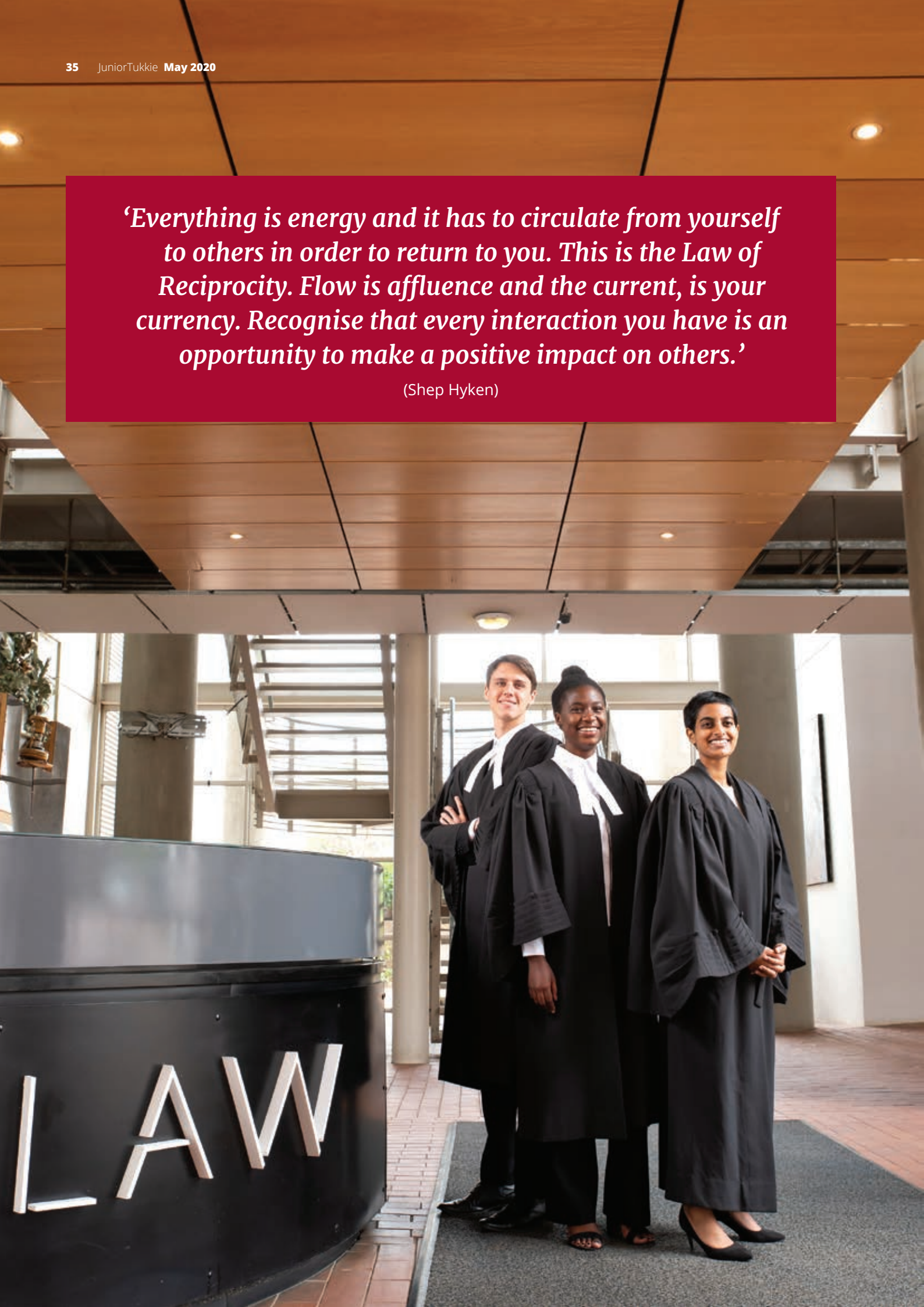
Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho

Humanities 100

'Everything is energy and it has to circulate from yourself to others in order to return to you. This is the Law of Reciprocity. Flow is affluence and the current, is your currency. Recognise that every interaction you have is an opportunity to make a positive impact on others.'

(Shep Hyken)



Law

South African team of learners, coached by UP Faculty of Law, wins gold at 5th International Schools Moot Court Competition

By Elzet Hurter

An octo-team of South African learners, coached by the University of Pretoria's (UP) Faculty of Law, walked away with the laurels from the 5th International Schools Moot Court Competition (ISMCC) in Gdynia, Poland, at the end of January 2020.

The SA team, who competed against Bulgaria, Romania, Mongolia, St Maarten, USA and Venezuela, was victorious in the final round against the USA. The eight team members who represented South Africa are from varying quintile (levels of fee-paying) schools in KwaZulu-Natal and the Eastern Cape. President Cyril Ramaphosa said, 'The victory is an achievement that all South Africans should celebrate. Team South Africa has made our country proud yet again and our learners' triumph demonstrates that when learners, educators and parents work together, we can achieve great things.'

During a moot court, learners simulate lawyers' roles, arguing both sides of a fictional case, as if they are in an actual court.

The final rounds of the South African competition were held in the Constitutional Court late last year. The South African National Schools Moot Court Competition (NSMCC) is a joint initiative of the Department of Basic Education and the Department of Justice and Constitutional Development, under the guidance of the South African Human Rights Commission (SAHRC), and is supported by the University of Pretoria. It was initiated a decade ago by Professor Christof Heyns, Professor of Human Rights Law and Director of the Institute for International and Comparative Law in Africa, when he was Dean of the Faculty of Law. Since then it has grown into a global competition.

'We are delighted by how well our learners and students do in moot court competitions globally, year after year. Participating in mock courts is a wonderful way of learning through role playing. The fact that our young people do so well augers well for the quality of our lawyers in the future, and for our legal system,' Heyns said after hearing the good news. He added that it is a 'great feather in the cap of the South African government that they have made moot courts part of the school curriculum.

'Many other countries, including Ghana, Kenya and Uganda, with the possibility of Argentina, Nepal and Sri Lanka, are now following the lead of South Africa and are also starting moots. We are working closely with them, but we still believe that in the world competition the South African learners will continue to be the team to beat.'

All high schools in the country are invited to enter a team of two learners for the South African NSMCC. The ISMCC requires teams from different countries to argue a hypothetical set of facts as if they are appearing before the International Criminal Court. This year's theme was 'Scene of Conflict over the past decade in Tabanath', with learners presenting their arguments on crimes against humanity in the form of deportation or the forced transfer of a population. South Africa defeated Team USA from New York City in the final round, over which judges from the International Criminal Court presided.

The South African team was also victorious in the final round of the ISMCC in 2016.

Prior to their participation in the ISMCC, Team SA received training for a week from senior law students and academics from UP's Faculty of Law. This entailed an introductory lecture on International Criminal Law, drafting of legal arguments, and oral presentations.

The team's coaches were Nyambeni Davhana, an academic associate at UP, and Keketso Kgomosotho, an alumnus and candidate attorney at Baker McKenzie.

In previous years, the international competition took place in The Hague, The Netherlands.

The team consisting of Sarushka Naidoo, Caitlin Schwarer of Eden College, Nondumiso Ntshangase, Nosipho Dube of Mathubesizwe High School in KZN, Mihlali Precious Stofile, Ondele Bede of Holy Cross; Okhela Sigwela, Lizalise Dlomo of Hudson Park High School in the Eastern Cape, defeated Team USA in the finals.

Natural and Agricultural Sciences

UP students head to SA semi-finals of FameLab science communication competition

By Primarashni Gower

University of Pretoria (UP) students Johannes Christoff Joubert and Joséphine Queffelec have made it to the semi-finals of the South African leg of FameLab, one of the biggest science communication competitions in the world.

The competition is open to anyone aged 21 to 35 working in or studying technology, engineering, medicine, biology, chemistry, physics or mathematics. According to Darryl Herron, a PhD candidate at UP's Forestry and Agricultural Biotechnology Institute (FABI) who co-ordinated the heat at UP, the competition was brought to South Africa by the British Council. The council has partnered with the South African Agency for Technology Advancement and Jive Media Africa to 'give young scientists the tools to explain their research to a general audience in three minutes.'

Several universities participated in the 2019-2020 heats and the winner will represent South Africa at the FameLab International final in the UK. At UP, 31 master's and PhD students competed in the plant health-focused heat.

Joubert, who won the heat, will be starting his PhD in Zoology this year. 'My work focuses on identifying the constitutive Eucalyptus defence compounds, which mediate the host preference of the Eucalyptus snout beetle. In a Eucalyptus plantation, many different genotypes of Eucalyptus trees are planted, and these beetles will feed on the leaves of certain genotypes while disregarding the others surrounding it.'

He had only three minutes to explain his research, so there was no time to speak of the tests he conducted. 'So, I focused on the beetle, describing it as a monster, detailing damages and losses that this beetle causes, and how my research could help combat this monster. I used a jar of live beetles as my prop to contrast how I described them, showing that this horrible monster was in fact a tiny and somewhat cute beetle, but despite its friendly appearance it was still a devastating monster.'

Joubert pointed out that scientists speak in the 'language of science, which is precise, analytical, detail-oriented and very boring to the general public, which leaves us talking only to our peers, thus alienating the general public. They don't understand our message, and they don't see how it can help them or how they can help it.'

Queffelec was a runner-up in the heat. Her PhD research focuses on an invasive species of wasp that is causing damage in pine plantations across South Africa. 'My project aims at answering questions such as: Why do we find more males than females in the field? How do males and females find and choose each other before mating? Can we help control the wasp by tampering with reproduction?'

In her presentation, she talked about how objects such as shoes, plants and wooden souvenirs can transport deadly bacteria, fungi and insects around the globe. Explaining how these objects can have an impact on forests, she likened them to murder weapons as the species they transport can kill trees once they arrive in a new environment.

Herron, a 2018 national FameLab finalist himself, said: 'Johannes and Josephine will join many other young and talented researchers who have been sharing their science stories over the past few months.'

2020 FameLab participants outside UP's Forestry and Agricultural Biotechnology Institute (FABI)

Johannes Christoff Joubert

Joséphine Queffelec

Natural and Agricultural Sciences

PhD student wins writing competition

By Martie Meyer

Quentin Guignard, a PhD student in the Department of Zoology and Entomology at the University of Pretoria, recently won a writing competition held in conjunction with the DST-NRF Centre of Excellence in Tree Health Biotechnology and *The Conversation Africa*.

Quentin Guignard

His cash prize of R30 000 will enable him to attend an international conference of his choice. The judges based their decision on the length of the articles, their relevance to the public and their accessibility to readers who are not scientists, which meant that the entrants had to explain the scientific principles simply without using subject-specific jargon.

When interviewed to find out how he felt about winning this prize, Quentin said: 'Winning this competition was proof to me that other people can be interested in what I am doing. I do not like overcomplicating things, but as scientists we are so afraid of not being accurate enough that we tend to lose people's attention when we talk to them. We don't find the right words or the right way to explain to them that what we do is both exciting and important. This competition offered me an opportunity to find an easy way to pique people's interest in what I am doing and to show how enthusiastic I am about it.'

He added that in his opinion it is very important that scientists communicate their knowledge to the public in order to increase general knowledge, raise awareness of problems—including ethical and health issues—and, in the case of his particular field of research, awareness of new ecological and economic threats. Effective communication of facts is also one of the best ways to fight the dissemination of misinformation and fake news.'

The competition was open to PhD students and postdoctoral fellows in the Forestry and Agricultural Biotechnology Institute and required the writing of an article on their research. Quentin's prize-winning article will be published on *The Conversation*, an online platform that puts a journalistic spin on articles written by academics from institutions worldwide. Interested mainstream media then publish those articles as they appear on the various platforms.

Quentin's article will soon be published online to reach a global readership.

Theology and Religion

Celebrating life in all its abundance

By Tshwanelo Serumola

Life Abundant is a support fund that was founded by Dana Mahan in the Faculty of Theology and Religion during the Fees Must Fall movement of 2016. It is led by an advisory council which allocates an annual budget for helping students at UP with various necessities such as school fees, food parcels, rent payments and underwriting the costs of vocationally enriching experiences.

Life Abundant also offers periodic research grants to students that are working on advanced qualifications such as master's or PhD degrees in the form of personal stipends that enable them to continue pursuing their academic goals. While being interviewed for this article, Dana was asked the following questions:

Q: What has been your greatest reward since establishing the fund?

A: What I have found most rewarding about leading Life Abundant are the opportunities to prevent students from dropping out or discontinuing their academic programmes for financial reasons.

Q: What future plans do you have for the fund?

A: In the next two years, we would like to see the total giving from the Fund to Theology and Religion students exceed the R1 million mark.

Q: What was one of your greatest challenges and how did you overcome it?

A: After establishing the fund with a single donor on board, the biggest challenge has been expanding our support base. However, in recent months, a host of individuals and other charitable organisations have joined the team financially, making it possible to expand our impact.

Another area in which the fund takes pride is its commitment to community engagement. In years gone by, this engagement with the world at large included helping UP students travel aboard so they could deepen their theological knowledge. Students have gone on mission trips to Africa, study excursions to European cities and participated in learnerships on university campuses across America.

As Lethabo Molopyane confirms: 'When I was going through a hard and stressful time due to financial difficulties, it seemed like my goals had to be put on hold. Life Abundant came to my rescue. It was a great honour and privilege to receive a grant from the fund which covered a portion of my tuition fees. Their financial assistance enabled me to continue my studies. God answered my prayers through Life Abundant and for that I am forever grateful.'

It is truly impressive that in the space of the last four years, from 2016 to 2019, Life Abundant was able to raise R613 000 in financial aid to Theology and Religion students. Although the scholarship is fairly new, it hopes to continue its campaign of support for years to come.

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Lethabo Molopyane

Theology students participating in the Life Abundant project

'Challenges are what make life interesting and overcoming them is what makes life meaningful.'

(Joshua Marine)

Education

Teachers cannot be replaced by artificial intelligence

By Prof Chika Sehoole

On World Teachers' Day, Professor Chika Sehoole, Dean of the Faculty of Education at the University of Pretoria, asserts that robots will never replace teachers.

Prof Chika Sehoole

Can robots and machines replace a teacher in a classroom? I pose this question in the light of the euphoria around the Fourth Industrial Revolution, which has taken the world by storm with concerns about the future of work.

Already in South Africa, banks are laying off people because of mechanisation, and the University of Pretoria has employed a robot, which is said to do some of the work which librarians are doing, signalling danger for the future of work in libraries. A study by the McKinsey Global Institute reports that by 2022 50% of companies believe that automation will decrease their numbers of full-time staff, and by 2030 robots will replace 800 million workers across the world.

In addressing the question of whether machines will replace teachers, allow me to take you down memory lane to meet three great teachers from the rural village of Marapyane who made an indelible mark on my schooling which no machine or robot could have done.

Mr Piet Makinta, my Grade 9 Afrikaans teacher was an outstanding teacher who came to class every day, gave us classwork almost every day, and the turnaround time for marking our classwork was 24 hours. He was an example of a teacher who loved his subject and passed that passion and desire to learn more on to his students. When the teacher not only has the right answer to a student's question but can expand the discussion with vivid examples and relevant facts, and when the teacher has a deep well of understanding and expertise to draw on, then every lesson is enriched and every student might be inspired.

Mr Makinta showed discipline and dedication to his work, and this had an infectious effect on us. We looked forward to his class, anticipating acquiring new vocabulary of the language of the oppressor. He made it fun to learn through amusing illustrative anecdotes that made us to develop a love for this language. Our daily classwork was followed by corrections ('verbeterings') the following day, to help us hone the art, skills and complexities of the language, resulting in mastery. At the end of that year I was a proud and effective speaker of the Afrikaans language. The thoroughness of his work was demonstrated by the fact that I used my Grade 9 course workbook to prepare for my matric examination. I majored in Afrikaans in my undergraduate studies and was admitted into an honours programme, which I declined.

Little did I know that in the future I would work at what is now a former Afrikaans-speaking university as a lecturer, professor and dean. Indeed, God works in mysterious ways and knows the beginning from the end. Thank you, Mr Makinta, for your selflessness. Your dedication and the skills you imparted are still helpful. I can still see you stepping into our classroom that had broken windowpanes; I can still hear your voice and your emphasis on correct pronunciations and ordering of words. A robot can never compete with you.

The second teacher is Mr Matthews Sebidi, my Grade 11 and 12 class teacher and Setswana teacher. When he was not at school or in the class, he was missed. There is something about teachers who are good and dedicated to what they do: they are missed by their learners. Teaching is not only about covering the subject matter, it is also about how it is done. The best teachers are often the ones who care the most deeply, not only about their jobs, but about every student they serve. It is not enough just to love the subject matter: Great teachers also share a love of students. Great teachers know how to communicate in order to enforce discipline. This is what Mr Sebidi did well without inflicting any pain on his learners. I once responded to his request to construct a sentence using a particular verb and the whole class burst into laughter because of its pedestrian features. Instead of punishing me, Mr Sebidi retorted: 'This one is playful and as such can never be admitted to a university.' That statement made me think deeply about my future. It was a diplomatic way of bringing me in line in terms of what can be said and done in a teaching and learning environment, and the implications of this for both the present and the future. True to his attribute of being a great teacher, he knew what each student was capable of individually and strove to help them attain their personal best.

Because I had ambitions of going to university, I started taking my conduct in the classroom seriously. I passed my Setswana subject in Matric very well and obtained a distinction in my first year at the University of the North (Limpopo). I later learnt that it was that distinction pass in Setswana that got me admitted to the Bachelor of Education Honours programme at the University of the Witwatersrand four years later. At the time, historically white institutions were unable to measure the aptitude of black students as the matric examination they wrote under apartheid was viewed as not reliable enough to measure the academic potential of black students. Thank you, Mr Sebidi, for your hard work, discipline and diligence, which opened doors for me against a system that was pitted against black people. Your quiet diplomacy and reprimand taught me a life lesson and shaped my path to who I am today. That, a robot could not do.

The third teacher was Mr Sello Lekotoko, my Grade 10 class teacher. In my first year at Khamane High School, he nominated me as one of nine students

to represent the school at a youth convention in Mafeking. I had no idea why I deserved this nomination. Upon our return from the convention, we had to report back to all the other learners. For the first time in my life I had to address a crowd of 300 learners. That took courage, confronting my fears and learning to be accountable, which are some key elements of leadership. Throughout my high school career and beyond, he took keen interest in my growth and development. Thank you, Mr Lekotoko. A robot cannot match your insight, interest and nurturing.

These three teachers, who are now enjoying their retirement in Marapyane, are some of the unsung heroes of this nation. They exhibited some of the attributes of great teachers: the ability to build caring relationships with students; excellent preparation and organisational skills and a strong work ethic. With few resources at their disposal, they were able to inspire greatness and ambition and a sense of purpose in their learners.

Great teachers touch the lives of their learners in ways that shape their destinies and have a lifelong impact.

No matter how good they may be, machines do not have the social and cognitive skills; they lack the empathy to adequately support their students and learners. Job roles that involve recognising cultural sensitivities, caring for others, creative or complex reasoning and perception are unlikely to be automated.

Teachers, you can relax, your jobs are safe, you will not be replaced by robots anytime soon. A word of advice: just never stop learning and improving yourself. Find ways of embracing the use of technology in your teaching.

As Henry Adams said:

‘A good teacher affects eternity; he can never tell where his influence stops.’

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Five years of equipping teachers with 21st-century skills

By Jody Joubert

On 24 October 2019, the Living Lab for Innovative Teaching at the University of Pretoria (LLITUP) research unit celebrated its fifth anniversary. A sizable birthday cake, 3D printed keychain gifts and festive decorations in the Collaboratorium’s characteristic pink and purple colours added to the festive atmosphere.

A Dream2Play session was hosted, incorporating a variety of activities, illustrating Grade R to Grade 9 level application of coding and robotics.

The LLITUP research unit was formally established at the end of 2014. The unit focuses on collaborative and interdisciplinary research in computer-integrated education, as driven through the Living Lab research paradigm and an appreciative inquiry strategy. This allows educators to focus on the possible positive impact of technology in a variety of educational settings.

During 2016 the LLITUP expanded its virtual existence into a physical space in the Natural Sciences Building on Groenkloof Campus, where participants can dream about the possibilities of incorporating educational technology into teaching and learning. Workshops are hosted to allow educators to Dream2Play, Dream2Design, Dream2Learn and Dream2Teach.

A focus on the development of complex skills to navigate the 21st century and the Fourth Industrial Revolution created the need for incorporation of different technologies into the Collaboratorium activities, such as robotics and coding.

The research unit moves forward with a vision of empowering teachers, students and lecturers. They look forward to collaboration with industry partners. The vision also includes the development of new and innovative activities that will cement their impact on education for the 21st century.

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Education students coding and programming robots

Veterinary Science

"Class Action" activities provide some welcome stress relief for students

"Class Action" has become a new buzzword in the Faculty of Veterinary Science at the Onderstepoort Campus.

The concept is aimed at providing some fun and physical activities for each class after their weekly tests in 2020 in order to alleviate the students' stress levels. The initiative kicked off during the third week of February when students commenced with their weekly tests. It has already proven to be quite popular and will continue for the 26 test weeks during the year.

The idea is to involve all the Faculty's sponsors and other interested parties who frequently request access to our students to participate in this initiative. There will be only two rules: The sponsor may not "lecture" the students for more than five minutes and there must be a physical activity involved in the interaction.

Each company will be given face time with our students for a one-week period as follows: On Monday it is the turn of the BVSc II class; on Tuesday the BVSc III class; on Wednesday the BVSc IV class; on Thursday the BVetNurs classes; while the week will end with the BVSc V class on Fridays.

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Twitter @OPtuks

Members of the BVSc III (top) and BVSc IV classes having fun on their respective "Class Action" days

Veterinary Science

The Faculty of Veterinary Science is celebrating 100 years of veterinary education

By Chris van Blerk

Congratulations to us! The Faculty is celebrating its centenary in 2020 and the festivities for the year kicked off on Friday, 7 February, with a special celebratory event at the Faculty's sports fields.

The festivities were opened by Prof Tawana Kupe, Vice-Chancellor and Principal of the University of Pretoria, and a special cake was baked for the event.

Speakers included the Dean of the Faculty, Prof Vinny Naidoo, Prof Gerry Swan, a former Dean of the Faculty, Prof Morkel Terblanche, former Deputy Dean (OP) and former Dean (Medunsa), Dr Alfred Kgasi, President of the South African Veterinary Council (SAVC), and Ms Fiona Pillay, current chairperson of the Faculty's Onderstepoort Paraveterinary and Veterinary Student Committee (OPVSC).

In 1999, the two Faculties of Veterinary Science of the University of Pretoria and MEDUNSA amalgamated to form one new national faculty at the Onderstepoort Campus. Since 1920 when Sir Arnold Theiler enrolled his first students, veterinary education has been at the forefront of animal production, health and welfare. The challenge to improve production for local consumption and for exportation still remains with veterinarians striving to attain these goals.

Due to the COVID-19 pandemic, a special veterinary centenary conference for this year was cancelled and its programme will run as a parallel track at next year's SAVA 2021 Biennial Congress in June at Emperors Palace in Johannesburg.

Other events will still take place at the Faculty later in the year depending on the pandemic.

Prof Tawana Kupe, Vice-Chancellor and Principal of the University cuts the cake with the Dean, Prof Vinny Naidoo and other VIP guests looking on

Prof Vinny Naidoo, Dean of the Faculty and other members of the Faculty's management team enjoying cake together

Staff members and students had a blast during the festive event

TuksSport

Tuks fencer loves the challenge of thinking on his feet

By Wilhelm de Swardt | Photographer: Reg Caldecott

Many might believe you can't do much in a mere millisecond, but in fencing, it's all it takes to win or lose a contest.

Jason Visser, the Tuks fencer who won gold in February during a Gauteng Tournament, can vouch for this. The challenge to make decisions in milliseconds is why he took up the sport. Currently, he is South Africa's top-ranked epee fencer in the u17 category. At the end of February, he represented South Africa in the African Championships in Ghana.

Being a firm believer in doing things his way is why he took up fencing. 'I am not one for team sports. I started fencing when I was in Grade One. When I put on my mask, it is only me and my "sword". Nothing else matters. Those few minutes, while I am duelling with an opponent, rids me of all my frustrations. My only focus is to spot a weakness in my opponent's defence and to score.

Fencing is simply not only about stabbing and slashing with your "sword", but during a duel, you are on your toes all the time. You need to analyse what is happening and find ways to outfox your opponent. Everything happens at great speed. You have to be ready to strike when your opponent drops his guard, because you may not get another opportunity.'

To be a competitive fencer takes a lot of dedication. Apart from having to master the finer intricacies of the sport, one needs to be fit. Visser runs regularly and trains in the gym.

International studies indicate that learners who fence from a young age, tend to excel in Mathematics and Visser, who is a Grade 10 learner at Pretoria Boys High School, writes: 'I am not sure if this is the case in every instance, but my average for Mathematics is 90%, and that may be because I have inherited my dad's genes. Mathematics also helps one to be analytical in the way you think. You are able to find solutions to problems in a split second.'

Jason Visser

TuksFencing will be hosting a high school fencing league this year. Johan Visser (TuksFencing Chairman) writes: 'Fencing is gaining in popularity and is a fast-growing sport. I hope to have more than 100 competitive fencers before the end of 2020.'

TuksSport

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TuksSport

Tuks netball player is second in International Supermodel Competition

By Wilhelm de Swardt
Photographer: Reg Caldecott

Beautiful, bright and ballsy would be an excellent way to describe Tuks's Danielle van Zyl. These qualities have led to her continually being able to challenge herself and succeed.

In 2019, Danielle represented the Proteas under-21 netball team. She is enrolled for a BA in psychology and hopes to one-day work as a neuropsychologist. Danielle is also keen to play netball for the Proteas.

Right now she has to find enough minutes every day to meet her academic and sport commitments. Fortunately, Danielle has her priorities nailed down to a tee. 'The most important thing is my studies. Then it is netball.'

During the first week of February, Danielle placed second in the 9th Supermodel International Competition, which took place in Chiang Mai, Thailand.

'Thai people are amazing; so humble and I was astonished by the respect they have for other people. They could not do enough for us. Getting to meet other contestants and learning more about their culture is something I cherish. I am considering entering the Miss South Africa competition in a year or so, although modelling is a hobby. I used to be somewhat of an introvert,' explains Danielle.

'You can't be a model if you are not comfortable with who you are. You must be able to sell any product while the cameras are focused on you. I went to the Vogue Model School where Valerie Begbie helped me to act with confidence. Marilize Brandt designed all my dresses and her creativity made all the difference.

'From a modelling perspective, being actively involved in sport is frowned upon. That is why at first I felt that I might be too "fat", actually muscular, to compete internationally, but then again, it has always been important to me to find a balance in life.

'I love playing netball and being a model, but I can't afford to become too muscular as it would impact on my modelling.'

Van Zyl's next big challenge is to make sure she is good enough again to play for the Jaguars in the national Telkom series. For the past two years, she has been instrumental in helping the Jaguars win the league.

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Danielle van Zyl

'Save to be a little richer tomorrow.
Exercise to be a little fitter tomorrow.
Read to be a little smarter tomorrow.'

(James Clear)

TuksSport

TuksSport High School sprinter the one to beat over 100 metres

By Wilhelm de Swardt | Photographer: Reg Caldecott

Whoever beats Thabang Hlohlo, a learner at the TuksSport High School, in the 100 metres can definitely claim to be one of the fastest schoolboy sprinters in South Africa.

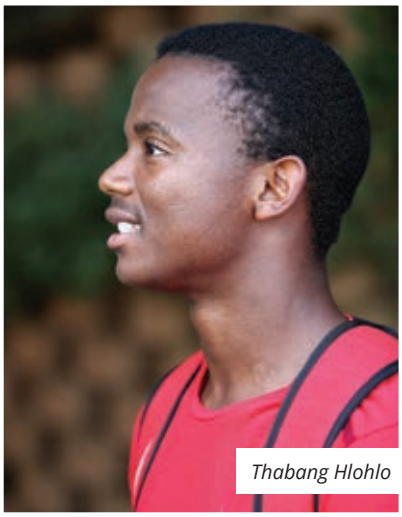
The young sprinter established himself last year as one of the most exciting prospects in South African athletics. He was victorious in the u18 100-metre races both in South Africa, as well as at the Africa Junior Championships last year. Locally he was not beaten once during 2019 in the short sprint when racing in his age group.

To top it all, his best time, 10.44s, has ranked him as one of the eighth-fastest under-18 sprinters in the world. An early highlight this season was winning the 100 m during the Twizza Super School Series Grand Finale at Tuks. His winning time was 10.51s.

Hlohlo is hesitant to make bold predictions. He believes in letting his legs do the talking of his achievements. 'I don't want to speculate about possible times. The only promise I can make is that every time I line up to race, my sole aim is to perform to the best of my ability.'

When he was younger Hhohlo excelled in rugby, hockey and football, but his heart lay in athletics. That is where he knew he would excel. Speed is in his genes. It is a family thing. His grandparents, father and mother could all run fast, so he is continuing their legacy. In his heyday Hhohlo's father, who now is 47 years old, ran sub 10.50 s times in the 100 metres. Hlohlo is confident that he will outsprint his dad.

The current 100 m world champion, Christian Coleman (USA), is a role model to the Tuks athlete and not only because of speedy exploits. 'I am relatively short for a sprinter, as is Christian. He has proven to me that lack of height is not a handicap when it comes to sprinting.'



Thabang Hlohlo

When asked about what his secret is he immediately mentions his coach, Thabo Matebedi. 'Thabo is the best coach. He relates well to every athlete he coaches. I trust what he tells me to do. I know when I do I run fast times. Currently, I rely on pure speed for good results, but my coach is also working on making me physically stronger.'

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Dealing with 'Friendship Overload' in the Age of Social Media

By Victoria Turk

You've barely responded to one message when another comes in. Then two more. Your phone is buzzing as if possessed—and you haven't even opened your email. Most of us have experienced digital overload . . . Our messaging feeds are becoming as stressful as our inboxes.

Can there be such a thing as "friendship overload"?

It feels shameful to admit that, sometimes, staying on top of communication with friends can seem more like a chore than a pleasure—just another piece of after-hours life administration. These are supposed to be your friends, after all.

When faced with constantly-replenishing unread texts, un-liked Instagram posts and unreturned DMs, however, it's perhaps only natural to feel a bit overwhelmed.

How can you save your sanity without being a bad friend?

- Only check your email inbox when you actually have time to do something with its contents.
- Only check WhatsApp or iMessage when you feasibly have a chance to respond.
- Try answering a message immediately with a short reply acknowledging that you've read it (a quick thumbs-up emoji) and then follow up with a more in-depth response at your leisure.
- Maintain messaging hygiene to prevent things from getting out of control.
- Your response to a friend in need should never be centered on how the timing is inconvenient for you.
- Try to limit your friendship communications to one main platform reduces the extra labour of constantly switching and will help stop things from falling through the cracks.

People are different; some like to have a constant stream of digital communication on the go, others may message on a more need-to-know basis. Neither approach is 'better' than the other, nor should you fall into the trap of judging a friendship by something as arbitrary as message frequency or average response time.

Speak honestly with your friends. If you're feeling overloaded, say so without making it a big deal. Feeling guilty about struggling to keep up is perhaps as much a sign of the strength of a friendship as any weakness: it means you care.

The excerpt comes from an article published on https://lithub.com/dealing-with-friendship-overload-in-the-age-of-social-media and is based on Victoria' Turk's book: Kill Reply All: A Modern Guide to Online Etiquette, from Social Media to Work to Love.

Do we still know our own faces in this tech-dominated society?

By Jessica Helfand

Perception may be one of the great core capacities of the human intellect, but in an age of robotic simulation, visual manipulation, and a seemingly unstoppable torrent of fake news, it's also an imperilled enterprise. How do we . . . discern the artificial from the authentic?

Today an entire spectrum of seductive technologies—mobile, social, virtual, wearable, and endlessly visual—challenge how we see both ourselves and each other.

Who has the right to take a photo of someone else's face, and why? What are the social conventions framing that right, the societal expectations motivating us to do so, the politics and ethics guiding the publication and dissemination, over time, of *anyone's* likeness? Who decides who gets to share?

It's a question of who owns our data . . . and who owns our faces? How we present to the world, *who* we present to the world—these are the means by which we visually scrutinize ourselves and each other. The mirror fragments and conceals, reframes, masks, manipulates, cajoles, and labels us all.

We are, at any given moment, prey to a series of ineffable classification schemes, all of us actors wearing multiple hats, playing plural roles, awash in a culture of pantomime.

The photo itself can be lit, cropped, doctored, distorted, airbrushed, redacted, or refashioned to amplify (or nullify) a particular trait. Consider social platforms like Facebook and Snapchat, Pinterest and Instagram—and all that they portend.

Facial recognition, once a sentient behaviour, is now a technological conceit. We are . . . being catapulted into a game of unconscious comparison, routinely measuring ourselves against type, and, worse, against each other.

The excerpt comes from an article published on https://lithub.com/dealing-with-friendship-overload-in-the-age-of-social-media and is based on Victoria' Turk's book: Kill Reply All: A Modern Guide to Online Etiquette, from Social Media to Work to Love.

UP residences

TuksVillage—a world-class African residence

#HEREWELIVE

By Robyn Ball and Kopano Bosman

These are just some of the words used to describe TuksVillage. TuksVillage is not just a bed to sleep on, nor a desk to study at. It is a community of students listening, learning and living together in an inclusive space, #HEREWELIVE. Established in 2008, TuksVillage is home to 640 students yearly.

A stroll through our beautiful facilities is sure to fill anyone with great excitement, pride and expectation. Our facilities offer communal-style units, self-catering kitchens as well as our own dining and mini-market facility. Our Village Centre caters for social and academic needs, offering entertainment, a printing facility, an IT lab and a study centre. The balance that comes with being a mixed-gender residence is an added bonus.

While we have much to boast about facilities-wise, it is who we are as a residence that is our greatest accolade. Our culture is driven by values-based engagements. Our focus is on the academic success of our Villagers and creating an environment and atmosphere that is conducive and supportive of this. Along with this, we strive to offer a home that is diverse, inclusive, caring and well balanced. Our calendar sees to it that students are well looked after socially, mentally, emotionally, physically and academically. Villagers enjoy participating in the organised sports leagues as well as an array of in-house events. Firm favourites are Mr & Ms TuksVillage, open mic evenings and our annual heritage celebration. TuksVillage has been a leader amongst residences in its mentorship programme, offering opportunities for seniors to give back to first-years as well as genuine guidance for incoming Villagers. This is truly a space in which students can thrive.

New Villagers will quickly learn that there are a few things that make Village special.

- We greet. Everyone is made to feel welcome by being greeted. Hi there. Dumêlang. Good morning. Lekker aand. Sawubona.
- We don't walk on our grass. We have beautiful pathways and respect our environment.
- We recycle! We are quiet. We care for our neighbours. We are responsible. We are Villagers!

When Villagers leave TuksVillage, they don't just leave with a degree. They leave with friendships that will last a lifetime. They leave with a worldview that has been challenged. They leave with (awesome) memories. They leave with ambition. They leave as leaders. They leave as active citizens. They leave to make a positive impact in society.

'After a long day of class, I get to choose to relax with a book in Timbuktu lounge, chill on our braai deck, watch a good game of sports (or a soapie) or watch the sunset with unit mates.'

UP residences

TuksVillage residents having fun

> I feel like I am part of a family. TuksVillage has taught me the principle of Ubuntu.

'Never once did I feel excluded. Never once did I feel in need or lacking of something, because of how we are cared for.'

Social media

Facebook	TuksVillage
Instagram	@TuksVillage
Twitter	#TuksVillage

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UP residences

NERINA The house in which you can put your trust

The only residence to be situated directly on the Hatfield Campus that embraces and homes approximately 300 vibrant, driven and well-rounded women, is built on the foundation of respect, unity, balance, integrity and excellence.

In 2019, we celebrated our 45th birthday with a great legacy of tradition behind us. The young women who call this place home have big hearts and are motivated to reach their full potential by taking part in various activities such as sports, well-being, RAG, internal and external culture.

Our mascot is a harlequin, fondly known as Nika. Nika is a timeless symbol of femininity and happiness, but also has a streak of seriousness. Nika represents boldness and attitude, defining all that Nerina women are.

With our primary focus on academic excellence and success, we strive to encourage a holistic approach to developing individuals that excel academically and personally. With a well-established and award-winning mentorship programme, the young women here are supported on their journey to obtaining their degree.

Sport at Nerina is all about participation and having fun both on and off the field. We have a reputation for taking part in every sport offered to the residences, which means that no matter your sporting interest, you will have an opportunity to represent Nerina in the sport at which you excel. Nerina does it all! There are women who participate who are almost 'pros' in their respective sports and those that have never set foot on a field and end up having an amazing time discovering a new talent.

Well-being at Nerina is definitely 'woke'. All the events and sessions presented are opportunities for the women of Nerina to practise respect, because here we acknowledge and understand that someone else's thoughts and feelings matter and are valid. Tight relationships are formed from Values Day and we discuss the deep and sensitive topics that form part of our daily lives. A Nerina woman is never alone and every step is celebrated.

We humble ourselves at the feet of many that are less fortunate than us by creating and running several projects throughout the year with the aim of reaching as many people and organisations as possible, such as CANSA. As Winston Churchill once said: 'From what we get, we can make a living; what we give, however, makes a life.'

While a lot of our focus is 'reaching out and giving', we look into the needs of the young women who reside here and in turn 'reach in and give'. We strive to live sustainably and ensure that we are doing our part. We run a successful recycling programme, use water wisely and save electricity where we can.

With a few years of success behind our 1nSync and UPAcapella, our vision for Nerina is not only to entertain, but to celebrate, inspire, as well as touch lives through the gift of music and dance.

Our vision includes following a collaborative process in creating a performance that not only challenges our competitors, but also ourselves—taking risks both musically and through the performance as a whole, while at the same time communicating a creative narrative through text, song choice and choreography. Hard work and long hours of rehearsals promise to reflect a fun, enthusiastic process and a memorable, exciting performance!

Nerina prides itself on hosting events, engagements and creating platforms that promote inclusivity, sisterhood and help our young women foster great relationships beyond the confines of the residence.

This is Nerina, the house in which we put our trust.

Contact information

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UP residences

2020 1nSync GI Nika

CANSA Shavathon

First-year Basketball Tournament winners

Netball teamwork makes the dream work

Sediba corridor on Values Day

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