TECH TALK
Apps to ease pandemic learning
Page 4

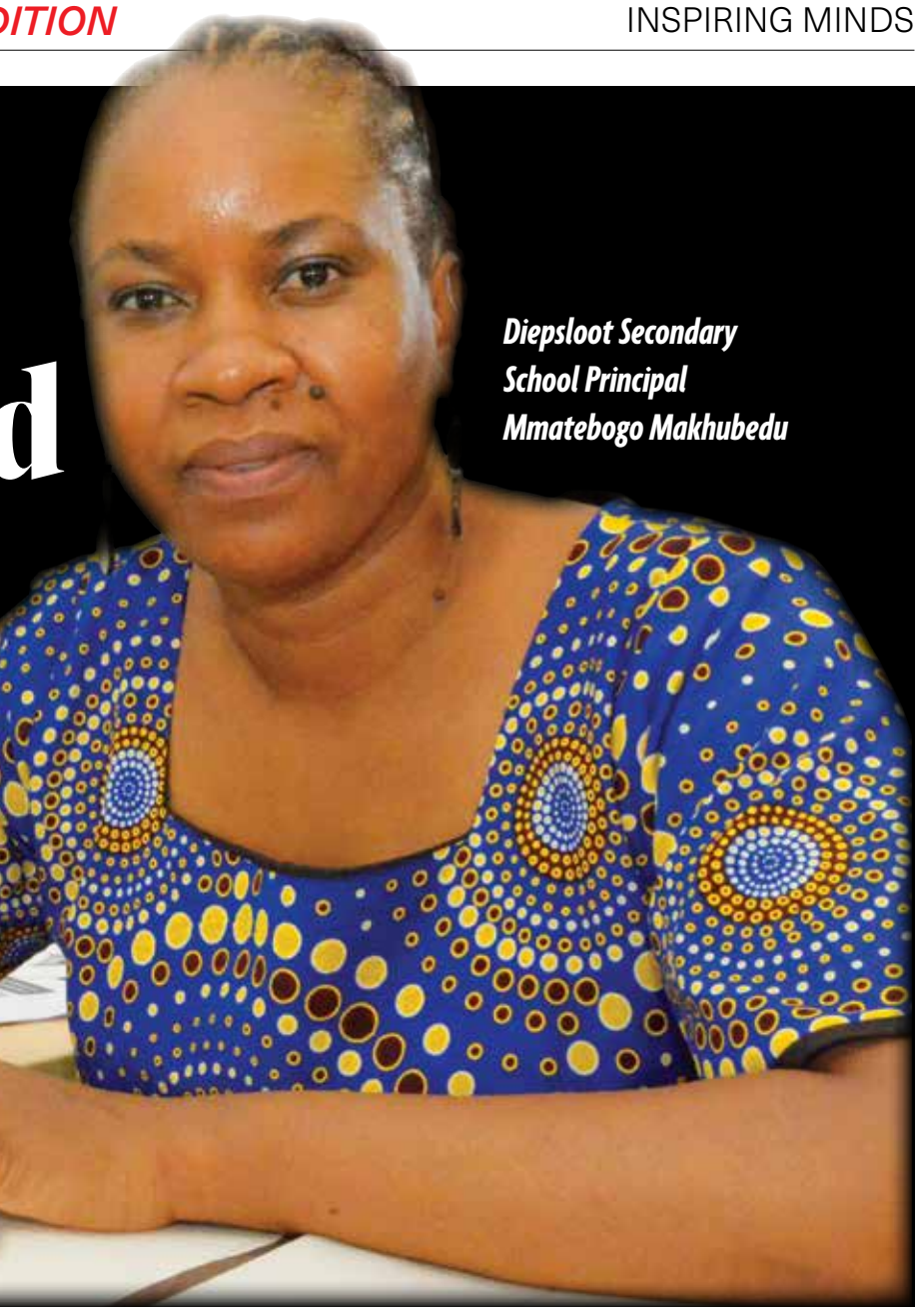
SA student Raeesah Jadwat makes it to Oxford
Page 12

OPINION
Basic Education Minister Angie Motshekga - Moving in the right direction
Page 14

InsideEducation

MARCH 2022 *LAUNCH EDITION* INSPIRING MINDS

How Diepsloot Underprivileged School Made It To The Top



Diepsloot Secondary School Principal Mmatebogo Makhubedu

Pages 2 - 3

Leadership

Diepsloot: A beacon of hope amid squalor

VICKY ABRAHAM

Diepsloot Secondary School Number 2 and 3, headed by Principal Mmatebogo Makhubedu is a beacon of hope in this community, which is generally known for its high crime rate and gangsterism. Makhubedu has proven that excellence has no special address as she has continued to produce an impressive matric pass rate since 2016. The school saw a 100 percent pass rate from 2016 to 2020, and a 98 percent pass rate in 2021, and the school was recognised by Gauteng MEC for Education, Panyaza Lesufi at the recent matric awards ceremony.

How she does it

To ensure that learners excel in their work and are not exposed to drugs, gangsterism and street bashes, Makhubedu has introduced night and weekend study sessions for Grade 11 and 12 learners. The learners are kept at school from 7 am to 4:30 pm. The Grade 12 learners return for evening study sessions at 5 pm and are transported home at 10 pm.

Her strategy has yielded good results. This has seen the school climb from a 54 percent matric pass rate in 2014. In 2021, out of 158 students who wrote their matric exams, 122 passed with entry to a Bachelor's degree, 34 diploma passes and six certificates.

"Diepsloot is in the middle of poverty and no parent is paying school fees there. Education is free," said Lesufi. Despite the living conditions in this area, the school produced excellent results, Lesufi said.

Ills of society not a deterrent

"Gangsterism is a problem. Our children (learners) survive because they are here. We try to keep them here at school because there's gangsterism and drugs in the township. When it's the weekend, these children forget about school. They only remember school on Monday, so we try to keep them at school most of the time. I don't want them to spend most of their time in the township," she said.

"Gangsters from different extensions fight against each other. They wait for each other at the gates after school. I have lost many learners, and three in Grade 12 (died). It hasn't been easy, it has been tough. But currently, it is better because we can manage. The problem is in the township, but it affects the school."

Not only have the learners suffered at the hands of criminals, but the school has also been affected. The school was recently vandalised, "they even broke into the toilets and the purpose was to destroy".

Makhubedu said: "It takes us backwards because instead of progressing, we utilise the funding that we receive to repair the damages at the school."

But these setbacks have not deterred this leader, her team of educators and learners strive for excellence.

Turning the tide

Makhubedu, who has been heading the school since 2015, said:"Other schools close at 3 pm. So, when our children (learners) leave school at 4:30 pm everybody is gone. They are tired, and they just want to go home. Therefore, they do not have time to mingle with the gangs."

Grade 12 learners said they were grateful to the school, their principal and teachers for introducing evening and weekend study sessions to protect them from crime.

"Thank you to Mme Makhubedu we are not in gangs. When we come back from school, we are already tired and we want to go home not to join gangs," said the Grade 12 learners.

Makhubedu explained that while she was deputy in 2014, the school had underperformed.

"I think we got a 54 percent matric pass rate," recalled Makhubedu. Based on her observation of the situation, she realised that although teachers were doing their work, it had emerged that the "learners were not studying".

Out of concern and to work towards improving the matric results, she held meetings with the School Governing Body (SGB).

"I said to the SGB, we need to change the status quo." She requested the relevant stakeholders to permit her "to introduce night study so that we can monitor the learners".

Based on the outcome of the meetings, she raised her concerns with the teachers and presented ideas to them, whilst the SGB communicated with parents.

This was propelled by the fact that although learners had alleged that they were studying, their matric results proved otherwise.

"If they are saying they are studying but it does not translate to something tangible, then we want to see how they are studying."

Requesting the teachers to commit to extra work involved money to compensate them.

"I said, I do not want them to teach at that hour (evening) because they taught the learners during the day. Therefore, the only thing that they will do is to monitor them at that time."

Enforcing the night study strategy yielded positive results

"From that year (2014) we moved from a 54 percent to a 94 percent pass rate in 2015. Then I thought to myself, 'this strategy is working'. We saw ourselves increase (number of matric learners enrolled at the school) and we saw a quality improvement."

"In 2019, we produced 60 percent Bachelor's passes, 65 percent in 2020 and 77 percent in 2021. From 2016 to 2020 we produced a 100 percent matric pass rate and 98 percent in 2021."

The 2 percent drop, came as a shock, but she explained that the situation was beyond their control.

"Sometimes when you do things you don't necessarily know the outcome. You are just trying your best and want learners to pass," said Makhubedu.

Apart from the effort with learners' studies, she emphasised that another contributing factor to the quality of results stemmed from "self-discipline".

"I believe in self-discipline and we have instilled that in our children."

The school's Commerce HOD, Jack Supe, said teachers would identify topics that learners were experiencing challenges with and perfect them. A learner would then be given special attention on the topic that they do not understand.

"Our teachers do not mind helping the learners during the week and on weekends. They would start the topic afresh to make sure that the learners understand what they were struggling with. They do not get frustrated from teaching and repeating the topic to accommodate the learners," said Supe.

Supe said the secret to the school's success was teamwork among the teachers.

"There's unity in the school and that is one thing that she (Makhubedu) believes in."

Every learner at Diepsloot Secondary School Number 1 and 2 campuses have a warm meal daily. PHOTO: EDDIE MTSWENI

CREDITS

Editor-in-chief:
• Phindile Xaba

Copy editor:
• Anneke du Toit

Contributors:
• Amy Musgrave
• Charles Molele
• Lucas Ledwaba
• Vicky Abraham

Photography:
• Eddie Mtsweni

Layout:
• Tebogo Menong

Publisher:
• Matuma Letsoalo

Sales
National Sales Manager:
• Adriana Botha

Sales Consultants:
• Dianne Willis
• Roslyn Oliphant

Twitter:
• @Inside_Edu

Facebook:
• Inside Education

Tel:
• +27 (10) 495 6212

Email:
• info@insideeducation.co.za

K AND K MEDIA

Press Council

SADTU says kudos to the 2021 Matric Class

SADTU
SOUTH AFRICAN DEMOCRATIC TEACHERS UNION

The South African Democratic Teachers' Union (SADTU), the largest organised labour formation in the public sector, notes the release of the 2021 matric results with a sense of pride. The results, as released, indicate an overall marginal improvement of 0,2% as compared to the previous year.

Nothing short of incredible for what our class of 2021 and teachers have achieved over the last traumatizing two years! They lost a significant amount of contact time with their educators in both Gr 11 and 12 due to COVID related lockdown regulations. This class deserves to be commended for showing resilience in the face of unprecedented circumstances leading to their final examinations.

We also want to congratulate and commend educators support personnel, parents, guardians, and the broader communities that afforded these learners the necessary support.
It remains our position that the matric results are being unnecessarily elevated into a central assessment tool for the efficiency of our education system. The media hype around matric results is misplaced and rather short sighted.

The release of the results often leads to an unnecessary "beauty contest" between the provinces thus diverting attention from the real challenges in the sector. Provinces have differing subjective conditions, and this has a direct impact on the outcomes thereof. Rural provinces like KZN, Limpopo, Eastern Cape, Mpumalanga deal with entirely different conditions as compared to provinces like the Western Cape and Gauteng.

The learning journey is composed of 12 formal grades and the Early Childhood Development phase; they are all equally important as part of the value chain. The cognitive development of our learners is almost entirely dependent on the Early Childhood Development phase. It is our view that there should be an increased investment into this sector by ensuring that work conditions are uniform across the various provinces and that the practitioners are exposed to continuous professional development initiatives.

Tech Talk

Apps to ease pandemic learning

With the onset of COVID-19, there has been a growing focus globally on apps and digital platforms that can assist children, students and parents with long-distance learning.

Here are some of the apps that are making an impact on learning.

Rocket Learning is a leading non-profit organisation in India that stimulates early childhood development through community engagement, focusing on parents and teachers.

The custom-built technology platform daily sends simple educational material to groups of parents and teachers through automated WhatsApp groups.

It currently has over 5 million learners and is reaching 20,000 teachers and 200,000 parents daily with contextualised content.

It supports parents to help teach their children critical early childhood learning, which includes how to recognise letters and numbers.

It asks parents to send back the children's responses, and the group model technology is complemented with real-time behavioural nudges and rewards, including personalised report cards and medals.

https://www.rocketlearning.org/

Kahoot! is one of the most popular learning and engagement platforms in the world.

The game-based learning platform was launched in 2013 and uses educational technology for schools, other educational institutions, and the workplace.

Its learning games are called "kahoots" and are user-generated multiple-choice quizzes that can be accessed using a web browser or the Kahoot! app.

The pandemic has seen a massive increase in users, with the company making the app available in Arabic earlier this year.

https://kahoot.com/

Smartpozi is a South African digital directory that has been designed to allow learners to search for teachers to get additional academic support.

It aims to break down barriers, encourage knowledge sharing, and provide access to education for underserved communities.

The platform gives pupils access to a database of tutors and teachers who specialise in a variety of subjects. It allows them to search by language, location, grade and school subject. They can review a teacher's credentials before signing up to work with them.

https://www.smartpozi.com/

■ *Compiled by Amy Musgrave*

Classroom Management

Teachers need to take charge of classrooms

MICHAEL ZWAAGSTRA

PROSPECTIVE teachers learn a lot about individualized instruction in faculties of education. That's because teachers are encouraged to personalize learning, for each student, as much as possible.

To a certain degree, this makes good sense. An inflexible cookie-cutter approach to education serves no one well.

At the same time, the pendulum has swung so far in the direction of individualisation that it's easy to lose sight of the fact that most teachers teach groups, not individuals. While classrooms are obviously made up of individual students, teachers are responsible for the entire group at the same time.

In other words, teachers need to take charge of their classrooms. Unruly classrooms are not places where quality learning takes place.

Effective classroom management

Unfortunately, most education faculties fall short in this area. When I was an education student, I learned next to nothing about effective classroom management. It was something I had to figure out on my own. Many other teachers find themselves in a similar situation.

This places an unfair burden on new teachers. Education professors fill their heads with various educational theories but do precious little to help them take charge of their classrooms. Even worse, they push the misguided notion that teachers should be "a guide on the side" rather than "a sage on the stage."

By encouraging prospective teachers to stay off to the side rather than stand in the front of the room, education professors make it harder for new teachers to establish their authority. This puts new teachers at a disadvantage right from day one.

Educate professors

A far better approach would be for education professors to focus less on their pet theories and more on how to effectively run a classroom with as many as 25 or 30 students. Here are a few tips to keep in mind.

Before doing anything, teachers must disabuse themselves of the notion that they are "co-learners" together with their students. While teachers can and do learn new things while teaching, a teacher should have far more expertise in the subject being taught than any of the students. If they don't, then the wrong person is in front of the room.

Simply put, it's important to have clarity of roles. Teachers and students are two separate roles, and we should not blur the distinction. After all, we don't call doctors and patients "co-healers," nor do we think of lawyers and clients as "co-litigators."

One of the fastest ways to erode the professional status of teachers is to demote teachers to mere facilitators of learning. Other professions would not tolerate this blurring of roles.

Setting a fair tone on day one

Teachers should also set a firm, but fair, tone on the very first day. This doesn't mean giving a long lecture about classroom rules, but it does mean making the behavioural standards clear. It's much easier to loosen the reins later in the year than it is to tighten them.

Keep emotion in check

Finally, teachers must keep their emotions in check. Students often test a teacher's limits, particularly when that teacher is new. When they do this, they are looking for an emotional reaction. Teachers shouldn't give them this reaction.

Teaching is a challenging profession. We can make it a lot easier if we equip new teachers with the knowledge and skills they need to take charge of their classrooms.

— Michael Zwaagstra is a public high school teacher, a senior fellow with the Frontier Centre for Public Policy, and author of A Sage on the Stage: Common Sense Reflections on Teaching and Learning.

Innovators

The boom in online schools

AMY MUSGRAVE

The COVID-19 pandemic has changed the face of education forever.

While institutions of education have mostly opened their doors again in South Africa, digital and distance learning is here to stay.

Globally there has been a mushrooming of online schools in a bid to aid the country's education system.

The Department of Basic Education (DBE) is currently working on a framework to regulate the escalation of online education and online schools that took place over the past two years.

E-learning has been permanently incorporated into several private schools and universities.

Although there have been numerous headaches around e-learning, especially amongst disadvantaged communities which are ill-equipped for going digital due to a lack of infrastructure such as broadband and tech gadgets, pupils and students need continued assistance to keep up with global education trends.

Fostering online learning helps those who do not have access to physical education institutions to continue learning and provides access to material and tutors. This is especially crucial in uncertain times and as COVID-19 mutates and future lockdowns may be a possibility.

Moving away from traditional schooling

While the government issued a warning again this year about a spike in dubious institutions as the education sector moves away from the traditional schooling model to an online-based curriculum, there are online schools that are making a difference.

These include the MTN Online School and the UCT Online High School, which were both established during the pandemic.

MTN Online School

In October 2021, MTN with the support of the DBE launched the MTN Online School.

It is a free online portal that props up the department's curriculum for Grades R to 12 and has additional features such as video lessons, assessments, and extra lessons for Grade 10 to 12 learners.

The solution, which was developed in partnership with the DBE and the National Education Collaboration Trust (NECT), is aimed at addressing the 21st-century learning needs of South Africa's children and closing the concerning gap in access to quality education.

The integrated online education portal is supported and housed on the MTN network and is zero data rated for MTN customers, which means it can be used without having to buy data.

UCT Online High School

The University of Cape Town Online High School opened its virtual doors in January this year to thousands of pupils and is the first school of its kind for a university in South Africa.

While the school will only take Grade 12 learners from next year, for now it covers pupils from Grade 8 to Grade 11.

The school was launched in partnership with Cape Town-based edu-tech company Valenture Institute, which specialises in secondary school education.

Like the MTN school, it aims to take advantage of the strides made in online teaching and the ability to scale quality education to reach a broad range of learners in different circumstances.

According to Vice-Chancellor Professor Mamokgethi Phakeng, the initiative addresses the challenges of two South Africas: one resourced and advantaged, the other under-resourced and disadvantaged.

"We can't keep doing the same things over and over and expect different results. We need to disrupt basic education," Phakeng said when the school was launched.

The concept has been extensively tested abroad, including at Stanford University and George Washington University in the United States. They both run successful online high schools.

The UCT school has two offerings – a fee-based education direct to the homes of pupils for R2,095 per month, and a special needs division which will take effect once the online school has en-

Online schooling is becoming the order of day.
PHOTO: Eddie Mtsweni

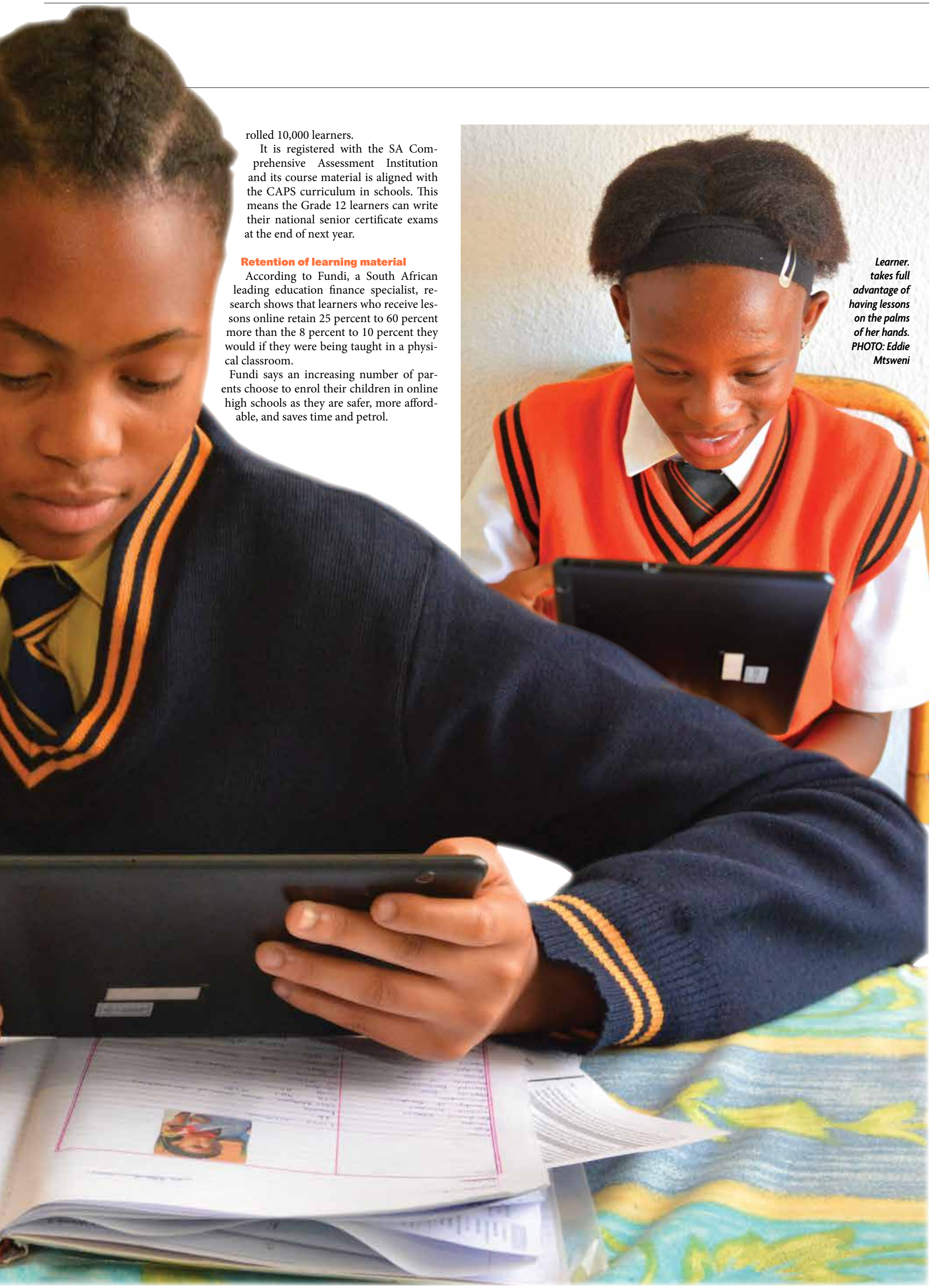
rolled 10,000 learners.

It is registered with the SA Comprehensive Assessment Institution and its course material is aligned with the CAPS curriculum in schools. This means the Grade 12 learners can write their national senior certificate exams at the end of next year.

Retention of learning material

According to Fundi, a South African leading education finance specialist, research shows that learners who receive lessons online retain 25 percent to 60 percent more than the 8 percent to 10 percent they would if they were being taught in a physical classroom.

Fundi says an increasing number of parents choose to enrol their children in online high schools as they are safer, more affordable, and saves time and petrol.



Learner. takes full advantage of having lessons on the palms of her hands. PHOTO: Eddie Mtsweni

Around The World

World's most dedicated teacher

VICKY ABRAHAM

Annamma Lucy received the 2021 Dedicated Teacher Award from the Cambridge University Press for her unwavering commitment to education. She was chosen from 13,000 nominations in entries from 112 countries.

Lucy, from the United Arab Emirates (UAE), lives to serve the poor and needy communities around her. Growing up an orphan who was raised by nuns at the Good Shepherd Sisters Bangalore in India, Lucy uses 10 percent of her monthly salary to assist children in East Africa, Western and South Asia.

A teacher at GEMS Our Own English High School, Sharjah – Boys' Branch in the UAE, Lucy explained that sacrificing 10 percent of her salary instead of spending it on dining with friends and family, was a way of contributing to meeting the needs of her students, as well as the poor and needy.

"Every month, 10 percent of my pay is donated to the poor. As a result of this deed, I feel God has given me abundantly and I have never felt burdened," said Lucy.

On two occasions, when she had saved up enough to do something special like buy herself a piece of jewellery, she sacrificed the savings to help the hungry in Tanzania at the height of COVID-19. Then, in December 2021 when she visited an orphanage in Mysore, India, they were about to have a black Christmas when this Good Samaritan stepped in to create an occasion to remember.

Demonstrated compassion

Lucy has also shown compassion to children and families whose homes were ravaged by floods in Karnataka, Kerala and Kochi (popularly known as Cochin) in India in 2018. Riding on her scooter, she spent about 3,000 Dirham (about R12,425) on food parcels, soap, and other ne-

To Page 10

PHOTO: SUPPLIED

Vodacom Advertorial

Vodacom's Schools of Excellence model promotes and supports academic excellence

BY TAKALANI NETSHITENZHE, EXTERNAL AFFAIRS DIRECTOR FOR VODACOM SOUTH AFRICA

Vodacom's Schools of Excellence model promotes and supports academic excellence. PHOTO: SUPPLIED

The world's prosperous economies invest hugely in education as this is the cornerstone of sustained economic growth and development. This is why the National Development Plan (NDP) recommends that for South Africa to successfully eliminate poverty and reduce inequality, the country needs to improve education, training and innovation. These factors are central to South Africa's long-term development and success. We are therefore proud that Vodacom's Schools of Excellence (SoE) model launched in 2019 and has the potential of being a model that can inject a culture of academic excellence into our schooling system.

Our commitment to using technology to provide high-quality education is inspired by former President Nelson Mandela's seminal words when he said: "It is not beyond our power to create a world in which all children have access to a good education. Those who do not believe this, have small imaginations."

At Vodacom, we believe that by working with the Department of Education and other social partners, we can create a world in which all children can have access to quality education.

To do this effectively, our interventions recognise that interconnected factors determine the success of the education system and that there is no single silver bullet to solve these challenges. Reform requires a holistic approach.

As part of Vodacom's commitment to bring about excellence in education for previously disadvantaged communities, we unveiled an education ecosystem to support the government's Vision 2030, a comprehensive approach to education. Launched in 2019, this ecosystem recognises that the success of the education system depends on a smooth interface and implementation of various pillars, underpinned by the partnership of various players.

One of these pillars is a Schools of Excellence model, which now supports 13 schools across the country. They were selected from the 3,000 schools that Vodacom had supported with information, communication and technology (ICT) since 2008 through both the Foundation and its license obligations. Each school of excellence is close to an early childhood development (ECD) centre, a teacher centre and a Vodacom ICT Youth Academy.

The Schools of Excellence Model

The SoE model is part of the comprehensive approach to education that Vodacom has adopted to support the government's "Vision 2030" education plan, to promote and support academic excellence for children from disadvantaged communities. To date, over R25,2 million has been spent on uplifting nearly 19,000 learners in these 13 schools.

In the Schools of Excellence, Vodacom has contributed the following:

- A fully equipped, connected computer centre
- Upgrades to the infrastructure, replacing broken windows and doors, fixing collapsing ceilings
- Eradicating the pit latrines and replacing them with adequate water and sanitation
- Upgrades to the security of the school and installing security systems
- Providing ICT support in the form of ICT training and change management
- Psychosocial support

The SoE model is yielding fantastic results. Some of the schools have begun to register an improved overall pass rate. For example, the Strydenburg Secondary School's pass rate increased from 61 percent to 90 percent in 2021. It was rated the most improved school in the Northern Cape in 2020. This model is a success, one that could truly improve secondary education countrywide.

To enable transformation through technology, the partnership first had to tackle access to basic services to create environments conducive to learning. Once aspects of these schools were structurally revamped, the technology side was actioned. SoEs have fully equipped and connected computer centres with upgraded security systems, teaching staff are provided with ICT support and training, as well as change management skills to ensure they're equipped to show learners the ropes in a new digitally enabled school setting. Vodacom placed 20 skilled psychosocial support professionals in SoEs to provide support due to the high prevalence of gender-based violence. SoEs also have ICT coordinators who provide tech support.

The adoption of ECDs as part of the ecosystem is a pivotal step towards instilling a culture of numeracy and literacy overlayed with digital skills for toddlers during their formative years. ECDs, like SoEs, has been upgraded and revamped, with pit latrines removed, and mobile libraries installed to provide digital literacy.

The pioneering ecosystem of which the SoEs are a part - created and nurtured by this partnership - addressed various education system imbalances which were halting progress. More partnerships of this nature are needed to continue strengthening the schooling system, at scale. We must come together in the spirit of collaboration to achieve our nation's shared goal for inclusive, quality education that opens up opportunities for real-world employment for all.

Takalani Netshitenzhe, External Affairs Director for Vodacom South Africa. PHOTO: SUPPLIED

Around The World

From Page 8

cessities for affected families, also providing clothing and other financial assistance.

Lucy does not only give financial and food support to the poor, but she also spends time with them to "experience their way of life".

Sharing her experience about empowering students and helping the poor in Uganda, Iraq, Tanzania, and villages in India, Lucy said: "First and foremost, a teacher must be a good human being. Volunteering and assisting the underprivileged in whatever manner I can, is near and dear to my heart."

Her upbringing

Lucy said she was grateful to grow up at an orphanage that only showed her love and taught her to lead a simple life. "I never felt that I was an orphan. Not a single day in my life at the orphanage did I feel that I had no parents. They loved me."

She says that this was the reason she was always ready to feed others. Even her friendships are far-reaching, she once had a friend who was a beggar and encouraged him to do something with his hands. He became a cobbler. She says any person should be able to accomplish their dreams, whether they are an orphan or not.

Her words of wisdom to all she meets: "Consider yourself to be the master of your own life, with the authority to make all your own decisions. Keep a close relationship with God. Accept that no one can love us as deeply as our parents. Never be taken in by false promises. Maintain your fortitude."

About the award

Lucy said teaching has been her childhood dream and that the recognition of receiving the Dedicated Teacher Award has boosted her confidence to continue on this trajectory.

"Winning this award has been a great validation of what I've achieved and I consider it an honour to be recognised among successful teachers. Professionally, it has given me credibility. I feel very proud to set an example to my colleagues to show that hard work and being passionate about what you do, leads to success. It's humbling, rewarding and exciting."

"Every day, even now, my kids (students) keep telling me that the award was given to the correct person. This Valentine's Day, I received an email from a current student, Jasim from Grade 8, telling me that 'all those accolades you earn now and then, you deserve it, for the love you have shown to us.'"

Reflecting on the day she was announced the winner, overjoyed she jumped on her couch, ran to the balcony, returned to the living room, picked up the phone, and called her mentor Ms Bindu Gopalakrishnan to share the good news. This led to a celebration with Gopalakrishnan, Srivalsan Murugan (the school's principal), colleagues, members of the senior management team, students and their parents, as well as friends and family who had supported her on this journey.

"I also called my husband and brother, who were in India, and thanked God for this excellent news," said Lucy.

What sets her apart

What sets Lucy apart from other teachers across the world, is that she makes use of her "creative background to take lessons out of paper and into the imagination of students, letting them witness the rich history of the world around them without the prism of tradition".

"I foster a mind that is capable of making its own decisions, rather than use that of the people around them. I maintain a warm, cheerful attitude with the parent community, resolve conflicts and handle difficult situations with remarkable patience and admirable tact," she says.

"My clarion call to my pupils is to inspire, create and invent because I think that every child is a promise of a better tomorrow. My goal has always been to uncover their untapped potential. Learn, dream and be."

PHOTO: SUPPLIED

Education News

Department of Basic Education publishes new revised calendar for inland and coastal schools in South Africa

STAFF WRITER

THE Department of Basic Education has gazetted the 2023 school calendar for inland and coastal students.

After two years of Covid-19 lockdowns which significantly impacted teaching time, the 2023 calendar will see a return to some normality with the return of 'staggered' open dates for both inland and coastal provinces.

This staggered date has historically accommodated people who were travelling from holidays – another part of South African life that has been significantly disrupted by the Covid-19 pandemic.

In 2023, inland schools will open from 11 January, while coastal schools are set to open from 18 January. The closing date for both inland and coastal schools is 13 December.

This equates to 199 actual school days for students and 203 school days for teachers who are expected to arrive slightly earlier and leave slightly later than their pupils.

Inland cluster 2023 school calendar

The inland cluster includes the Free State, Gauteng, Mpumalanga and North West provinces.

Coastal cluster 2023 school calendar

The coastal cluster includes the Eastern Cape, KwaZulu-Nata, Northern Cape and Western Cape provinces.

Since its outbreak two years ago, the Covid-19 pandemic has disrupted education systems globally, affecting the most vulnerable learners the hardest, the department said in its annual performance plan tabled this week.

"Enrolment in the first quarter of 2021 was around 50,000 (0.4%) lower than expected. The problem concentrated in lower grades. 54% of contact time was lost in 2020 due to closures and rotations. In the second half of 2021, 22% of contact time lost due to rotations and regular absenteeism."

However, these averages hide huge inequalities across grades and schools, it said.

"In historically disadvantaged schools, around 70% of a year's worth of learning was lost in 2020. For every day of schooling lost, around 1.3 days of learning are lost.

"The heavy lifting in ensuring the success of the development program to improve the situation of the youngest children in our communities which will focus on better decisions, improved systems, improved capacity, effectiveness and performance so as to improve their learning outcomes."

- Business Tech

SACE CELEBRATES THE 2022 HUMAN RIGHTS DAY

The South African Council for Educators (SACE) joins the nation in commemorating the 2022 Human Rights Month under the theme "The Year of Unity and Renewal: Protecting and Preserving our Human Rights Gains".

This year's commemoration of Human Rights Month coincides with the 25th anniversary of the adoption of the Constitution. The Constitution enshrines the rights of all people in South Africa and affirms the democratic values of human dignity, equality, and freedom.

As we celebrate this year's theme, SACE would like to take this opportunity to honour all educators for demonstrating that the future of the teaching profession looks even brighter despite the COVID-19 pandemic fears, uncertainties, anxieties, and complexities.

As we celebrate Human Rights, SACE would like to bring to the spotlight, Teacher Rights.Teachers have the right to work in an environment in which they feel valued and respected, where they actively support learners' development and learning and where they are free from fear, threat, and harm.

The increase of violence against our teachers is a threat to their rights and it has reached alarming proportions. SACE developed the Handbook on Teachers' Safety and Security in South African Schools with the support of the VVOB. The Handbook aims to provide educators with access to their rights and responsibilities regarding violence in schools. It also provides further guidance on how educators should protect themselves in violent situations they may confront in the school environment. Additionally, workbook and facilitator's guide have been developed for schools and stakeholders that may want to capacitate their school communities and educators in particular.

Research has shown that many educators feel that their rights are being violated at times in both the classroom and on the school property. It is essential that all educators are respected, and their rights are protected, but the success of this depends on the contribution of all role-players.

AS WE CELEBRATE THE 2022 HUMAN RIGHTS MONTH, LET US HONOUR OUR TEACHERS BY PLEDGING TO FIGHT THE SCOURGE OF GENDER AND SCHOOL-BASED VIOLENCE.

Ms ME Mokgalane
Chief Executive Officer - South African Council for Educators

Learner's Inspiration

SA student makes it to Oxford

VICKY ABRAHAM

Raeesah Jadwat's (19) dream to study Physics and Philosophy at the world's second-oldest university has come to fruition. This young South African first set foot on Oxford University soil seven years ago while visiting her 70-year-old grandmother Zuby Jadwat in England. At the time, the 12-year-old Jadwat envisioned herself studying at the prestigious university where there is evidence of teaching from about 1096.

"It was a dream that I voiced as we walked through the streets. I even asked if we could stay there a bit longer, as I wanted to be immersed in the environment," said Jadwat who hails from Sandton, Johannesburg.

Scooping up distinctions

Jadwat, a top A-Level student at St John's College in Houghton is among approximately 2,880 students from South Africa who wrote Cambridge International AS and A Level exams in November 2021. She scooped up distinctions in Mathematics, Further Mathematics, Physics, and Chemistry. She has chosen to study Physics and Philosophy at the University of Oxford as both these fields deeply intrigue her, and their intersectionality is the ideal overlap of her interests.

She specifically selected the University of Oxford for several reasons: "The university pioneered the field of philosophy of science and remains the global leader in the course. I believe the tutorial system of teaching suits my style of learning and will enable me to engage with the content of study more meaningfully," said Jadwat.

She added: "I recently turned 19, so my first bucket list where I wrote 'go to Oxford' is now seven years old, buried somewhere in the boxes of childhood work my parents insist on keeping."

When she learnt of her acceptance

She heard about her acceptance at the University of Oxford on January 11, 2022.

"My grandmother expressed her joy and pride in me, acknowledging that all the effort that went into reaching this point was worth it. She added that my (late) grandfather (AK Jadwat) would have mirrored her sentiments and revealed that his love of Oxford University is what motivated her to take me there on that first trip without him."

Jadwat's parents could not be more proud. "We were elated by the news as all the hard work and effort that Raeesah had put in over the years had culminated in her realising her dream. It is every parent's wish to witness the realisation of their child's full potential," said Jadwat's parents, Haseena and Ebrahim Jadwat.

Parental support

Her parents will be paying for her overall fees and she will jet off to England later this year to begin her term of study in September.

"My parents, who have contributed so heavily to making this dream a reality, will be funding my studies. I am applying for a scholarship because applications are not yet closed. I will only receive responses later during the year," said Jadwat.

Reflecting on her upbringing, Jadwat said that she was raised in a loving and supportive environment, which encompasses her parents and extended family.

Her roadmap

"At a fairly young age, I had mapped out a significant part of the roadmap I had hoped to follow. My parents were always there to guide and refine my efforts but never to redirect them. I owe a lot to them and my grandparents for creating an environment that valued my educational development while prioritising my outlook and my aspirations. I am grateful to have a family that bolstered my efforts."

Her motivation to work hard stemmed from her enjoyment of learning, especially mathematics and science.

"In that respect, I feel very lucky that I was genuinely interested in the content I studied because the motivation to work through it did not feel manufactured or forced. The elements of problem-solving in my subjects attracted me to them, with a sense of satisfaction that followed in grappling with difficult questions that finally clicked."

Apart from "self-motivated study, I also credit my environment for being a space that supported academic commitment".

When it all paid off

Asked what went through her mind when she discovered that her grades were excellent, she said: "There was an initial shock followed by elation and an overwhelming sense of relief. While I was never resentful of the amount of work I put in, it felt incredible to see that effort materialise in my results."

Jadwat said she was not expecting to pass with flying colours.

"No, I was hopeful that everything would work out but not expectant of anything meaningful. Exams are an anxiety-inducing time and my timetable meant that I wrote most papers in quick succession of one another, with little time to process my feelings toward one paper before having to move on to the next. Almost two months of waiting (for results) built up quite a sense of nervousness."

She said: "There were times when the workload and a self-imposed demand for perfection took its toll. I often find that one's harshest critic is oneself, and sometimes that criticism feels insurmountable. What always helped in overcoming that hopelessness was the unwavering support of those around me."

Will she return to South Africa?

It will take her four years to complete her degree, Jadwat said. "My only set intention academically is to study further, to obtain a doctorate in theoretical physics. To that end, I hope to complete my studies at one of the best institutions possible."

"A goal I hope to see come to fruition is creating access for women, especially women of colour, in Science, Technology, Engineering, and Math (STEM). I intend to work toward developing that access specifically for women from South Africa, and Africa more generally, who are severely locked out of academic structures in science. I would prioritise working as an academic at an institution that would help facilitate such an aim."

Opinion

Matric results are a real sign of hope – and a tribute to Angie Motshekga

OPINION: Michael le Cordeur

There is no doubt that the education system is starting to stabilise. Not only is this healthy for a young democracy such as South Africa, but it provides hope for a country in which there is otherwise little to get excited about.

Prophets of doom

When the COVID-19 pandemic hit the world in March 2020, the prophets of doom expected the worst for education in this country. They did not, however, take into account the willpower of our country's teachers, most of whom – we now know – still see their task as a calling.

The prophets of doom also did not take into account that our children have a vision for themselves and are doing everything they can to make it come true. They were even less aware of the resilience of our school communities who were not prepared to succumb to the pandemic.

The COVID-19 pandemic has over the past two years revealed the shortcomings of education in this country. The crisis has forced us to prioritise aspects that have long been awaiting a resolution. It created opportunities to heal South Africa's education of many defects. The matric pass rate of 76.4 percent is proof of this.

Low pass rate in perspective

Why the excitement about the improvement by 0.2 percent of the pass rate of the eighth class to write the examination under the CAPS curriculum?

First, it is nearly the same as in 2020 even though it is the second year that the class had to go to school under strict lockdown restrictions. Everyone expected that the pass rate in 2020 would be lower than in 2019, for it was the first year of the pandemic. But it was feared that after the second year of the pandemic, it could lead to a catastrophe. Thus the nearly exuberant relief over the slightly improved pass rate.

Upwards adjustment

Two questions are hanging over these results which I would like to address. The first is that nearly half the subjects were adjusted upwards. Some may wilfully argue that without these adjustments the pass rate would have been much lower. This may be true. But adjustments of marks in the school system are as old as education itself.

The Council for Quality Assurance in General and Further Education and Training (Umalusi), which approved the results, has confirmed that 28 subjects were adjusted upwards. They include Afrikaans First/Home language and Second Additional Language, English First/Home Language, Economics, Physical Science and Accounting. The fact that it also applies to scarce subjects like Engineering Graphics, Visual Art, and Mechanical and Civil Technology is an indication that the upwards adjustment was necessary at all schools, including former Model C schools.

Why?

This is the first class that has wrestled with the pandemic for two consecutive years. As a result, this class required more academic assistance. Worldwide it is a general practice to standardise results to avoid excessive variations owing to factors that are unrelated to pupils' abilities and knowledge. A total of 35 subjects were left unchanged.

The 30 percent debate

The second point of contention is the so-called 30 percent debate. A pupil can pass matric at one of three levels. Each requires a specific combination of subjects and pass requirements, namely:

- To pass matric with the Higher Certificate the pupils must achieve at least 40 percent in the home/first language, as well as 40 percent in TWO other subjects, passing at least six out of seven subjects, and 30 percent in four other subjects. The matriculant will then be able to do a certificate course at a career college;
- A pupil can pass matric with a "diploma" if at least 40 percent is achieved in the first/home language, as well as 40 percent in THREE other subjects, with at least 30 percent in the language of tuition of the higher education institution and passing at least six out of seven subjects. Such a pupil can take a diploma course at a career college or university of technology; or
- A matriculant achieves a "Bachelor's pass" (previously matric exemption) if 40 percent is achieved in the first/home language, as well as 50 percent in FOUR other subjects (including life orientation), at least 30 percent in the higher education institution's language of tuition, passing only ONE subject with 30 percent and passing six out of seven subjects. Such a pupil can do a degree course at any university.

It is thus not only a matter of passing six subjects with 30 percent. I trust that parents and younger pupils will also take note of the importance of the home language. When a student applies to a university, the mark achieved in the home language is the first thing we look at.

Provinces

A close look at the different provinces brings many interesting perspectives to the fore. The most important is that the gap between rural and urban provinces is shrinking. This is the result of the continued intervention programme of the Department of Basic Education. Except for the Free State, which has set the tone for three years, provinces such as North West, Mpumalanga, Northern Cape and Eastern Cape (all hovering in the 70s) are closing the gap with the urban provinces, Gauteng and the Western Cape. The latter two remain constant and maintain a pass rate in the 80s while North West improves continuously.

We are overjoyed that the Eastern Cape's improvement since last year has continued; and we applaud the Northern Cape, which showed the greatest improvement by 5.4 percent. Good administration in that province is bearing fruit. The only exception is Limpopo where the poverty issue is not yet under control. The department will have to intervene urgently. The province has shown a decrease for the second consecutive year.

Source: Professor Michael le Cordeur

Top 10 regions

The domination of the large cities of Gauteng (Tshwane, Johannesburg and Ekurhuleni) and Cape Town (Metropole North) continues, but it is gratifying that the upward curve in the rural areas is also visible here. All the districts of the Free State are in the top 10 and what a wonderful surprise that the two rural districts in the Western Cape (Eden in the Southern Cape and Central Karoo) are also among the top 10!

Acknowledgement

Maybe it is time that we give credit where it is due: a minister who – I believe – gives the education of our children priority in her heart. The class of 2021 was hard hit by the pandemic. Especially pupils in poorer areas had a tough struggle. Fighting a pandemic in the past two years leading up to your matric exam – and still passing matric the way this class did – is no small feat.

South Africa has triumphed over colonialism and apartheid. It now looks as if we can beat a pandemic. Angie Motshekga is not without flaws, but she has passed the most important tests.

Prof Michael le Cordeur is the Vice-Dean Teaching and Learning in the Education Faculty at the University of Stellenbosch.

Article first published in Daily Maverick on 25 Jan 2022. Inside Education republishes it with the permission of Prof Michael le Cordeur.

Telkom Foundation Advertorial

TELKOM PIVOTS INTO THE FUTURE

Telkom SA is South Africa's most recognised and important communications brand.

The Telkom Group of companies provides integrated solutions in the information, communication and technology (ICT) market, and is the leading provider of converged services in telecoms and information technology.

From its beginnings in 1991 as the sole provider of fixed-line telephony in South Africa, the company has transformed into the backbone of the country's emerging digital economy, providing the network infrastructure that underpins digital services in retail, telecoms, health, education, manufacturing, and many other key sectors of the economy.

Think of any transaction that the ordinary South African makes daily, and there is a good chance that Telkom's network and infrastructure made it possible.

For instance, every year, Telkom's systems facilitate billions of online payments and card transactions, making South Africa's banking and financial sector among the most secure and trusted in the world.

The company also provides the digital infrastructure that makes e-government possible. Telkom facilitates the digitalisation of critical government functions and services such as the police, hospital record keeping, home affairs population records, and the provision of education services to millions of South African learners and students.

Telkom has provided and continues to provide the backbone of communication systems for major events in South Africa, such as the 2010 FIFA World Cup, as well as providing support to the Independent Electoral Commission to run free and fair elections.

In recent years, Telkom, as the newest entrant in the growing mobile telecommunications market through Telkom Mobile, has driven an unprecedented fall in the price of data in South Africa and is recognised as the leading disruptor and most exciting brand in mobile telecoms.

The company is now also a facilitator of growth for South African SMMEs, transforming its established Yellow Pages into Yep!, a 21st-century, digitally-based platform that links small businesses to price-sensitive customers looking for fast, reliable services.

Last, but not least, Openserve, Telkom's fibre infrastructure provider, maintains the largest fixed internet network, supporting hundreds of Internet Service Providers (ISPs) that bring the digital world into millions of homes and businesses.

How Telkom does all of this

The Telkom Company consists of five business units.

Openserve is South Africa's leading wholesale infrastructure connectivity provider with the largest open-access network across the country. Our open-access model allows us to provide broadband, enterprise, optical and carrier solutions to customers across the following segments:

- Consumer – addresses the broadband connectivity needs of end customers through multiple ISPs
- Enterprise – enables business-to-business connectivity through high-bandwidth connectivity products and solutions
- Carrier – comprises customer-specific high-capacity backhaul and managed connectivity services for network service providers
- Global – provides network infrastructure such as submarine cables and satellite

Telkom Consumer is driven by high-speed mobile broadband and, together with its fixed-line network, is a converged communications provider. It operates in mobile and fixed-line high-speed broadband.

It is serviced by the following access mediums:

- Owned mobile network
- Owned content platform
- Owned ISP
- Fixed services provided on a reseller basis

Yep! is a leading digital solutions company providing converged communication and intern service and technology solutions to small businesses in the country. The Yep! customer segments are made up of single-owned businesses, small businesses and medium-sized businesses in all verticals and industries of the economy.

BCX is a state-of-the-art technology company that provides ICT solutions and an integrated portfolio of technology solutions. These customers comprise corporates in the areas of retail, mining, banking, financial services, healthcare, large businesses and public sectors.

Gyro incorporates masts and towers, property investment and a property services business. It manages the property portfolio of Telkom currently utilised for operations. Gyro customer segments include mobile network operators, wireless ISPs, broadband providers, the public sector, and all property segments such as retail, office, industrial, residential, student accommodation and data centres.

The Telkom of the Future

Telkom in the 21st century is all about seamlessly connecting our customers to a better life through people development, simple and digital processes, and a federated operating model.

This is being done through five strategic pillars known as PIVOT.

They are:

- Portfolio diversification
- Integrated services
- Victory in broadband
- Operation efficiency
- Technology innovation

PIVOT captures the transformational changes to our core business by moving from voice to data, from legacy to fibre, fixed wireless to mobile, and from connectivity to IT service solutions and digital ecosystems.

Based on the overarching five strategic pillars, each of our five business units has its specific strategic objectives and focus areas.

We continue to review our business portfolios and explore how to unlock value from them over the next couple of years.

Telkom's future success, as a company and as a trusted service provider and a strategic national asset for South Africa, depends on its ability to unlock the value of innovation and the value inherent in its various businesses.

Telkom's market valuation is not a reflection of the intrinsic value within the Group.

The company trades and is valued as a telco multiple, yet its portfolio of businesses also consists of IT, masts and towers, consumer technology and content, and infrastructure businesses. Many of these are valued higher than telcos globally.

Our strategy is geared towards unlocking and realising all this value not just for shareholders, but for our customers, our employees, and South Africa as a whole.

Telkom Foundation Advertorial

Education - The heartbeat of

The Telkom Foundation, under the stewardship of Sarah Leneisang Mthintso, strives to make progressive ways of learning and teaching, the foundation's focal point.

For the Telkom Foundation, a focus on education is an obvious choice, believing this to be the best way to effect change in society. Over the past few years, the foundation has upped its game regarding the way it assists schools, learners and teachers.

The unemployment rate and the level of poverty among South Africa's youth continue to soar, they desperately need skills to navigate the 21st century, and business will ultimately be affected if it does not assist in improving education.

"The foundation recognises that Telkom as a group, to which we are affiliated, operates in a society that is riddled with myriad of challenges, and if we don't do anything today, we will be in a crisis tomorrow," says Mthintso.

She says that some can argue that these challenges are a government problem or a societal issue, the ripple effects for South Africa are vast. They will be dire if stakeholders do not act.

"It means that we are unlikely to have customers in the future because if people aren't participating in the mainstream economy, we can't attract customers," she says.

"We also recognise that we find ourselves in a very competitive landscape, and to remain in the game, we need to build a future that attracts the right skills."

Telkom Foundation Programmes

While the foundation has multiple projects, they are interconnected components of a greater strategy, with learners as our "unit of change".

This means that its programmes focus on securing academic success in subjects that focus on Science, Technology, Engineering, and Mathematics (STEM) while ensuring that learners are "future fit" by exposing them to digital skills.

"At the heart of it all, we are doing this so that we can produce learners who are resilient, learners who have grit, learners who are constantly aware of the world of work that is rapidly changing, learners who have a very strong desire to perform in Maths and Science," says Mthintso.

Telkom's main online learning platform is available through the ed-tech platform Lightbulb Education. It is zero-rated and provides learners with high quality interactive digital STEM content.

Another component is the foundation's five-year Connected Schools project which started in 2017, where the foundation has connected a number of schools in the country, including seven in Gauteng and the Eastern Cape.

These seven schools received a range of support including assistance in the integration of ICT in teaching and learning.

"We don't just dump computers at schools, we go out of our way to lay fibre cables to ensure best user experience," says the head of the foundation.

"We have deployed technology in various schools. But these seven schools all have fibre, each one has a dedicated laboratory, and students have devices."

As part of its Supplementary Programme for Maths and Science, tutors are available on the weekends and holidays to provide curriculum-based tuition to reinforce what pupils learn at school.

Learners are also introduced to digital skills such as coding and robotics to prepare them for the rapidly changing world of work.

The difference that tech and caring makes

Before the Telkom Foundation started helping schools, many of these children had never had access to comprehensive information, communication and technology (ICT) solutions.

"The first thing we did was think about how we assist in teaching learners how to use these computers. The second was to also focus on skills that we believe are important in advancing an understanding and knowledge of digital skills. And these are things like problem-solving, critical thinking, and innovation," Mthintso explains.

"We did not only want to expose them to the technical skills, but we also wanted to make them aware of the societal challenges that exist and how technology could assist in solving some of those problems.

"So as a result of that fusion of soft skills and technical skills, we got learners to a point where they were able to identify societal challenges in their surroundings and to use what they were learning to develop basic, coded prototypes."

The results have been dramatic.

Mthintso says youngsters have developed basic apps and that one learner had built a website for his school.

She highlighted an app that was developed by another participant in the foundation's programmes, describing it as profound despite it being basic. It helps those who use taxis for transport to determine how far away a taxi is, how long it will take, whether the vehicle is full and if it has a seat available.

Changing the face of education through collaboration

Asked what needs to happen on a larger scale to improve the education system and ensure the country was on par globally, Mthintso says that collaboration between the private sector and the govern-

the Telkom foundation

Telkom Foundation places emphasis on teacher development and learner support. PHOTO: EDDIE MTSWENI

Ensuring learners are ready for the digital economy

The Telkom Foundation, through its digital skills programme, is already implementing what many believe to be the classroom of the future.

The foundation is miles ahead of many others in readying learners for the digital economy.

"We pride ourselves in having introduced our young people not only to coding and robotics, but also to emerging technologies such as fintech, the internet of things (IoT), and artificial intelligence (AI). We think it is important to understand today, what the world of tomorrow will look like," says Sarah Leneisang Mthintso, who heads up the foundation.

The results from its coding project are so impressive, that the Department of Basic Education has asked the foundation to collaborate and assist in its pilot coding programme. The foundation has been running this project for five years.

The foundation focuses on Science, Technology, Engineering, and Mathematics (STEM) and to achieve good results, it has through the years assessed Grade 9 learners. The research found that a dual approach of remedial intervention and helping learners catch up with their day-to-day learning was needed for them to succeed.

"We found that if you don't remediate, then children struggle. They are lost in the class because they don't have the basic foundation to be able to do what they need to do," says Mthintso.

"We focus on Maths and Science because, in our view, these are core in terms of helping children make informed decisions towards careers that are dominating the future. If you want to be a computer scientist, a data analyst or a statistician, you need that foundation, and that foundation becomes a stepping stone in making the right choices in terms of your career."

Training teachers essential for Telkom Foundation

Upskilling teachers to be digitally savvy, and helping equip principals with the right leadership expertise to bolster South Africa's education system, are critical elements in the Telkom Foundation's strategy.

According to the foundation's head, Sarah Leneisang Mthintso, addressing the development of teachers results in a higher success rate for learners.

"Regarding teacher development, we focus on integrating technology and improving pedagogy and content knowledge," she says, explaining that there has been a considerable shift in teaching methods."

Mthintso says the foundation has seen how technology has just as an example improved school administration.

"Instead of notices for meetings written on paper, principals are now scheduling meetings using computer programmes," she says.

"There was no e-mail. And, so when we started coming into schools, we had to start with those basics, simply just using email."

Teachers now know how to communicate on Microsoft Teams, they make use of videos and build these into PowerPoint presentations when preparing their lessons.

They also use interactive smart boards in the classroom.

The foundation is also working with principals to ensure that they improve their instructional leadership.

"To strengthen leadership in schools, we are working with school leaders to improve their instructional leadership abilities to effectively manage and lead. With the introduction of technology, the school leaders have a responsibility to inspire everyone to embrace its use."

Head of the Telkom Foundation, Sarah Leneisang Mthintso. PHOTO: SUPPLIED

ment was crucial.

"We often get trapped as the private sector in who flies the flags the highest rather than collaborating to address challenges facing the country and eliminating duplications," she says.

"The second thing we need to do is to review and revise the curriculum to respond to changing needs.

"We miss out on opportunities to teach children the things that they need to know, the things that will be useful today and tomorrow," she warns.

As Telkom reviews the past five years of running its various programmes, Mthintso says education will remain its priority, adding that former President Nelson Mandela put it best when he said that education is a powerful weapon to create meaningful change.

Telkom Foundation Advertorial

Telkom Foundation connecting learners and teachers to the digital revolution

The Telkom Foundation has invested over R50 million annually towards bursary scheme that benefited 1900 teachers and 3500 students that were supported through the school programme. Most of them are pursuing programmes in science related studies in various South African universities.

The intention is to ensure that they have access to post matric education to increase their chances at entrepreneurship and employability.

With Covid 19 and lockdowns, many learners were unable to attend classes and as a result, the foundation migrated the STEM Supplementary Tuition programme to an online format, enabling learners to continue with their studies.

A total of 3,687 learners in this supplementary programme received devices and mobile connectivity, which made remote learning possible. Some of the classes were recorded and learners could watch them in their own time at home.

The closure of schools during this time put extra pressure on the teaching system, but through the foundation's intervention programme targeting teachers and district officials, 1,950 professionals were trained in productivity tools and resources that were useful in remote learning.

Teachers benefitted greatly from the Teacher Professional Development Programme which provided them with the ICT skills to make efficient use of sponsored touchscreen laptops, and interactive smartboards. Each of the participating schools was given access to Wi-Fi LAN infrastructure and printers. Through this project alone, 310 teachers and 108 senior management team members were trained.

The Telkom Foundation's efforts have led to great success, here are some of those stories.


Nozipho Mabaso

■ Nozipho Mabaso is a first-year Chemical Engineering student at the University of Witwatersrand and hails from Soweto, Gauteng. Mabaso received a bursary from the Telkom Foundation to cover her studies.

"I learnt about it (Telkom Foundation) through the Alexandra Education Committee, which is a secondary school bursary scheme but also helps children with other programmes. They acted as a middleman between myself and the foundation. I received a positive response and was able to get an educational bursary.

"It has honestly lifted so much weight off my shoulders, and that of my parents. Through this funding, I do not have to worry about my fees, accommodation and living allowance. I can now put my focus on my studies. I will make sure that I pass all my modules with flying colours, to avoid repeating the year or losing further funding opportunities."


Kamogelo Mugwena

■ Kamogelo Mugwena is a first-year Bachelor of Science in Mathematical Statistics student at the University of Pretoria and comes from Soshanguve, Gauteng. Mugwena is a recipient of the Telkom Foundation bursary.

"It so happens that Telkom came through for me because they knew my home situation. I am now fully registered and attending classes. Thanks to Telkom."

"My degree offers a broad spectrum of possibilities and I know that I will easily find employment. This will depend on the majors I specialise in, of course, but I could enter into Actuarial Science or become a Statistician. I am grateful that I have been given a chance, not forgetting that my tuition fees have been fully paid."


Violet Shadung

■ Violet Shadung is a Grade 9 and Grade 11 teacher at Ruabohlale Secondary School in Soshanguve, Gauteng. Shadung benefitted from the Telkom Foundation's Teacher Development Programme.

"In 2017, Telkom selected my school to form part of the schools it was funding. Initially, I was not part of the delegation attending the teacher development programme, but fortunately, when my principal was unable to attend, I took his place, and what a blessing it was. The Telkom Foundation has changed my life drastically.

"I was reflecting with my son, that the things that were impossible to do, I now do with the greatest of ease. I struggled to save question papers I had set out for learners, but today I can confidently say that I am more than competent when it comes to using digital technology in my profession. Since attending coding classes, I am becoming a master coder."


Vera Ngoatje

■ Vera Ngoatje is a Grade 9 and Grade 12 teacher at MH Baloyi Secondary School in Soshanguve, Gauteng. Ngoatje benefitted from the Telkom Foundation's Teacher Development Programme.

"Our school was selected to be part of the Telkom schools programme in Winterveldt for five years, and I was chosen by our principal to be the project manager.

"Not only has it changed my life, but it also changed that of my colleagues and our learners. Our school was fitted with a fully functional computer lab with a capacity of 50.

"Grade 8 and 9 classrooms were fitted with interactive smartboards, educators were given laptops. We received ICT training and our learners attended the Telkom Supplementary Programme. This programme has allowed me to become a project manager, which opened other doors and I have received numerous training sessions."


Jongisapho Ndeya

■ Jongisapho Ndeya is a BSc Computer Science student at the University of Pretoria and is from Soshanguve, Gauteng. Ndeya benefitted from the Telkom Foundation's Programme

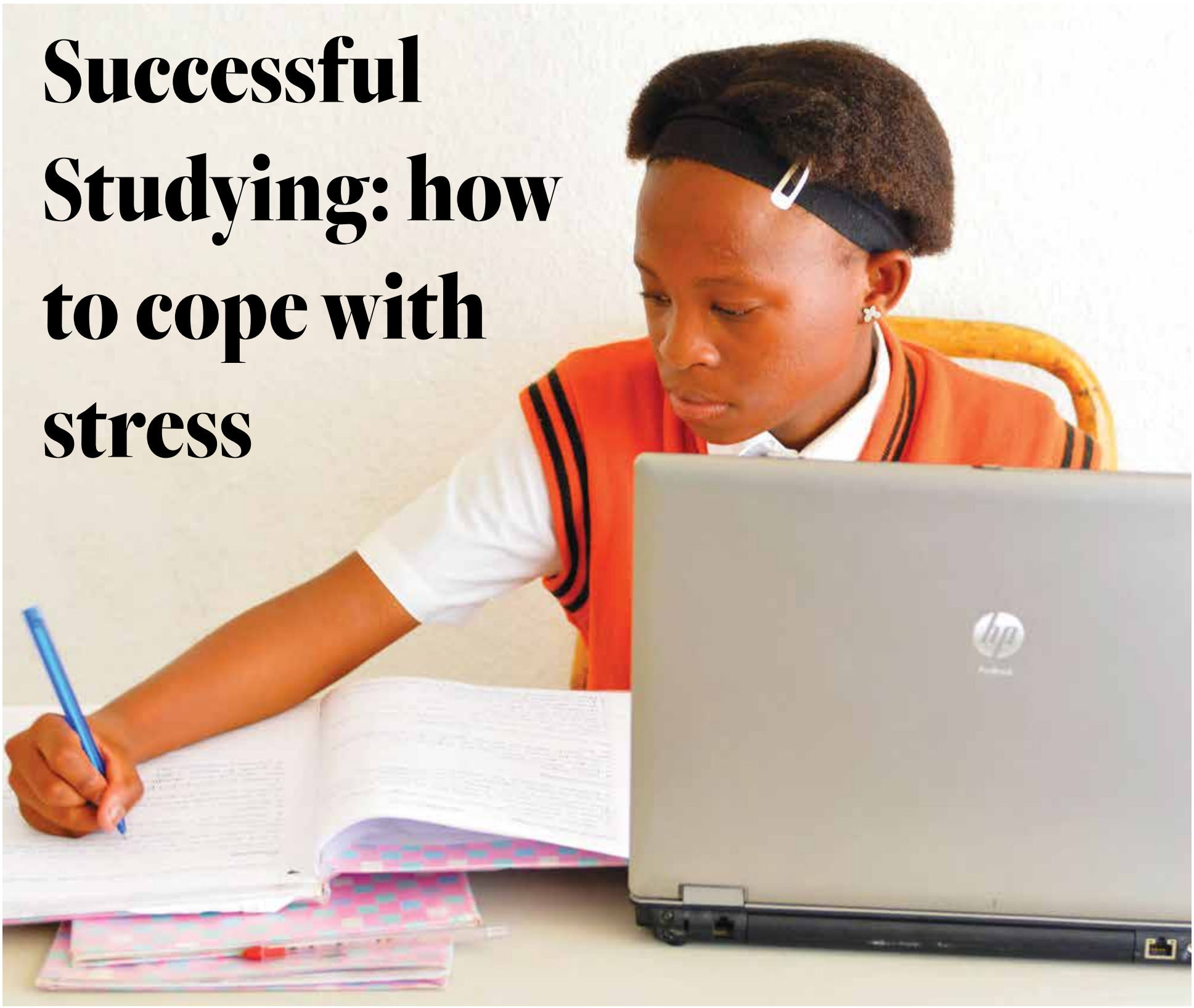
"My teachers told me that the Telkom Foundation was coming to our school to introduce learners to everything ICT-related. A few months later the foundation donated equipment such as laptops and smartboards, they also assisted with Saturday extra lessons. I would say the funding helped. Before they came to my school, I didn't know much about the ICT industry and after engaging with all their material and physically working with the equipment, all I want is to know more and more.

"At the moment I'm studying towards a BSc in Computer Science. When I am done with my studies I want to be a software developer.

"When I got to varsity, some students struggled with certain subjects because they required a bit of background in computer studies. Through the foundation's digital skills programme, I've had a headstart in subjects like programming, which other students found extremely challenging to grasp."

Mental Health

Successful Studying: how to cope with stress



Studying for tests and exams can be stressful, not only do you want to do well, but there is pressure from parents or caregivers and peers to achieve the required results. With The South African Depression and Anxiety Group (SADAG) reporting a significant increase in students and learners calling this helpline over exam periods, exam stress is real and needs to be addressed or there could be tragic consequences.

Here are seven practical tips to help cope with exam stress:

1. Manage your study time effectively

As soon as you receive your exam timetable, put a study schedule together. Knowing you have a plan (with enough time to revise everything) will give you a sense of control. Being able to tick items off every day is a great motivator! Make your schedule realistic and be sure to schedule in personal time too.

2. Learn to practise mindfulness

Mindfulness is the art of being fully present in each moment and with the task at hand. It helps the mind to focus and reduces anxiety, stress and negative emotions. A few ways of practising mindfulness are meditation and yoga. Here's a simple guide to get you started on mindfulness.

3. Healthy body, healthy mind

Eating properly, exercising and getting enough sleep will go a long way in reducing anxiety and re-energising the mind. Make sure you are eating a balanced and nutritious diet, try to exercise for at least half an hour every day and get at least eight hours of sleep a night.

4. Have a stress-free study environment

Your place of study (be it your room at home, a study, or the library) needs to be as conducive to studying as possible. Keep clutter, background noise and distractions to a minimum.

Stay tuned for a future article on how to achieve the perfect study environment.

5. Believe in yourself

Often just telling yourself "I CAN do this" is all you need to squash anxious thoughts and emotions. According to counselling psychologist and life coach Kerry Acheson, you should observe what happens with your thoughts, feelings and your body when you are anxious, and replace these "negative" thoughts with positive ones. "Putting affirmation statements up around the house can help," Acheson says. She also says you should remind yourself of challenges you have overcome in the past, and then apply what you learned to the current situation.

6. Figure out what helps you cope better

Some people cope better by tackling the situation head-on, whereas others might cope better by managing the emotional stress of the situation. According to Acheson, this is known as problem-focused coping versus emotion-focused coping.

Problem-focused coping is figuring out exactly what is stressing you out and then taking practical steps to remove the stressor, whereas emotion-focused coping is reducing the anxiety associated with the problem. For example:

- Problem-focused coping: the incessant drilling outside your house is stressing you out, so you go to the library to study. Problem solved.
- Emotion-focused coping: you are anxious about the amount of studying you have to do, so you decide to go for a walk to clear your head.

But the "problem" will still be there when you get back.

While problem-focused coping resolves the anxiety in its entirety, emotion-focused coping can be counter-productive. The walk to clear your head could leave you refreshed and ready to tackle the next study session, but excessive avoidance of the problem, such as watching too much TV, is not the answer.

Both methods have their merits; you just need to figure out what works for you.

7. Ask for help

There is no shame in asking for help. If you feel you are not coping and are feeling overwhelmed, reach out to your family, a friend, or a counsellor at your school or place of education. You don't need to go through this alone.

■ *Provided by: South African Depression and Anxiety Group(SADAG)*
https://www.sadag.org
For emergencies call: 0800 567 567

Wellness

Food for brainpower

The foods you eat play a crucial role in keeping your brain healthy and can improve specific mental tasks, such as memory and concentration. This is according to an article by Kerri-Ann Jennings published on Healthline.com where nutritionist Kathy W Warwick gives her take on brain food.

Here are two great brainfood choices to make.

Pumpkin Seeds

Pumpkin seeds are rich in Omega-3 and Omega-6 fatty acids, and zinc. Data shows that these seeds consist of about 73 percent unsaturated fats, and these play a role in reducing inflammation. Omega-3 and Omega-6 are polyunsaturated fats that can't be manufactured by the body, they help keep the frontoparietal region, the part of the brain known for problem-solving, more fluid. Pumpkin seeds also provide over 70 percent of the recommended daily allowance of zinc, which improves communication between neurons and may help reduce memory loss. - fatty.com

Fatty fish

When people talk about brain foods, fatty fish is often at the top of the list. This type of fish includes salmon, trout, Albacore tuna, herring, and sardines, all of which are rich sources of omega-3 fatty acids. About 60 percent of your brain is made of fat, and half of that fat is comprised of Omega-3 fatty acids, and the brain uses this to build brain and nerve cells. These fats are essential for learning and memory.

Omega-3 also offers several other benefits for your brain. It may slow age-related mental decline and help ward off Alzheimer's disease. Not getting enough Omega-3 is linked to learning impairments as well as depression. In general, eating fish seems to have positive health benefits. Some research also suggests that people who eat fish regularly tend to have more grey matter, and this contains most of the nerve cells that control decision making, memory, and emotion. Overall, fatty fish is an excellent choice for brain health. - Healthline.com

- Compiled by Phindile Xaba

Universities

UCT chemical engineering graduand Sarah Nzeka exemplifies the spirit of not giving up

Sarah Nzeka graduated with a BSc in Chemical Engineering on 29 March 2022. PHOTO: SUPPLIED

STEPHEN LANGTRY

UNIVERSITY of Cape Town (UCT) student Sarah Nzeka will graduate with a Bachelor of Science (BSc) in Chemical Engineering on 29 March 2022 after registering at UCT for the first time in 2012. The journey to graduation day has not been easy.

Sarah succeeded in completing a tough academic programme. On the road to graduation, she survived isolation during the COVID-19 pandemic, financial exclusion, a violent physical attack and the death of her father. With her undergraduate studies behind her, she said, "I'm not limiting myself."

Sarah, who is from the Democratic Republic of the Congo, first came to Cape Town in 2006. She enrolled at the Cape Peninsula University of Technology (CPUT) where she studied for three years and completed a national diploma in chemical engineering. "I was a top student in my department. That opened the door for me to get a bursary to further my studies [towards a BSc in Chemical Engineering] at UCT," she said.

"I was excited and [looked] forward to a great journey," Sarah said. But she found the transition to UCT challenging. The pace was different, and she also registered late and missed orientation and the first few weeks of classes.

"I didn't know how to find resources and lecture venues. What seemed to be minor challenges ended up becoming bigger problems because I was always late. I struggled to adequately fit into the environment."

As a result, she had poor results at the end of the first year and her scholarship was not renewed after the second year.

She then had to find part-time jobs to supplement the financial support that she received from her family in order to continue studying.

But, the added burden of part-time jobs meant that she had less time to concentrate on her studies. "My focus was divided," she said. "It was a continuous cycle. But I was determined to get my degree."

Going back home

In 2014, Sarah was the victim of a terrible assault. She was attacked and thrown from a moving train. She sustained serious injuries, which included a fractured skull and impaired hearing. She was confined to bed for a month and continued experiencing anxiety, excruciating headaches and fatigue long after getting back on her feet.

She returned to university at the start of the next semester. In consultation with the department, her academic workload was reduced. "I wasn't happy about that," she said.

In 2017, she was financially excluded from UCT. "The major blow in 2017 was that in November I lost my dad [who was in the DRC]," she said.

"Very quickly things spiralled downwards. Life became very gloomy for me, and I didn't see a future for me here. At that point, I decided to go back home."

While in the DRC, she became determined to continue working towards her dream of obtaining a degree. She returned to South Africa in 2018 but because of outstanding fee debt she could not re-register at UCT. She found part-time jobs to support herself and carried on searching for sponsorship to cover her fee debt.

During the time she lived in Cape Town, Sarah had approximately 10 different jobs. She was a waitress, taught English online, did transcribing and translating from English to French, worked as a babysitter, and as a computer lab assistant. She also worked at a guesthouse as a night assistant manager, which meant that she often left campus to go to work.

In 2019, with the help of her family members, she was able to clear her fee debt and re-registered to continue her degree programme. In 2020, she was introduced to Professor Alphose Zingoni, the director of the Klaus-Jürgen Bathe (KJB) Leadership Programme who provided financial assistance. She received once-off support from the KJB programme, which covered her tuition fees. She still had to continue with part-time work in order to meet her other needs.

The pandemic strikes

When the COVID-19 pandemic hit South Africa and the rest of the world, Sarah struggled to adapt to online learning and her anxiety levels were heightened by the social isolation. She passed some of her courses at the end of 2020. She was grateful that UCT allowed students to register in 2021 without having to pay the full amount.

She expressed appreciation for the support that she received from her family. She had never planned with them that she would come to UCT after completing her national diploma at CPUT. Originally from Lubumbashi in the DRC, it was her mother, in particular, who encouraged her to pursue further studies. In her community, education was not seen as a priority for women and girls; however, her three older sisters all furthered their education in Namibia.

Sarah is passionate about science and was grateful for the support systems in the Faculty of Engineering & the Built Environment (EBE) and the Department of Chemical Engineering. Mary Hilton, from EBE, provided a shoulder to lean on and directed Sarah towards several options including KJB Leadership Programme.

Sarah is also grateful for Professor Harro von Blottnitz who provided practical advice in his capacity as the fourth-year student advisor, and who in conjunction with Hilton, Heydenrych and Associate Professor Dave Wright continuously offered guidance in her final year.

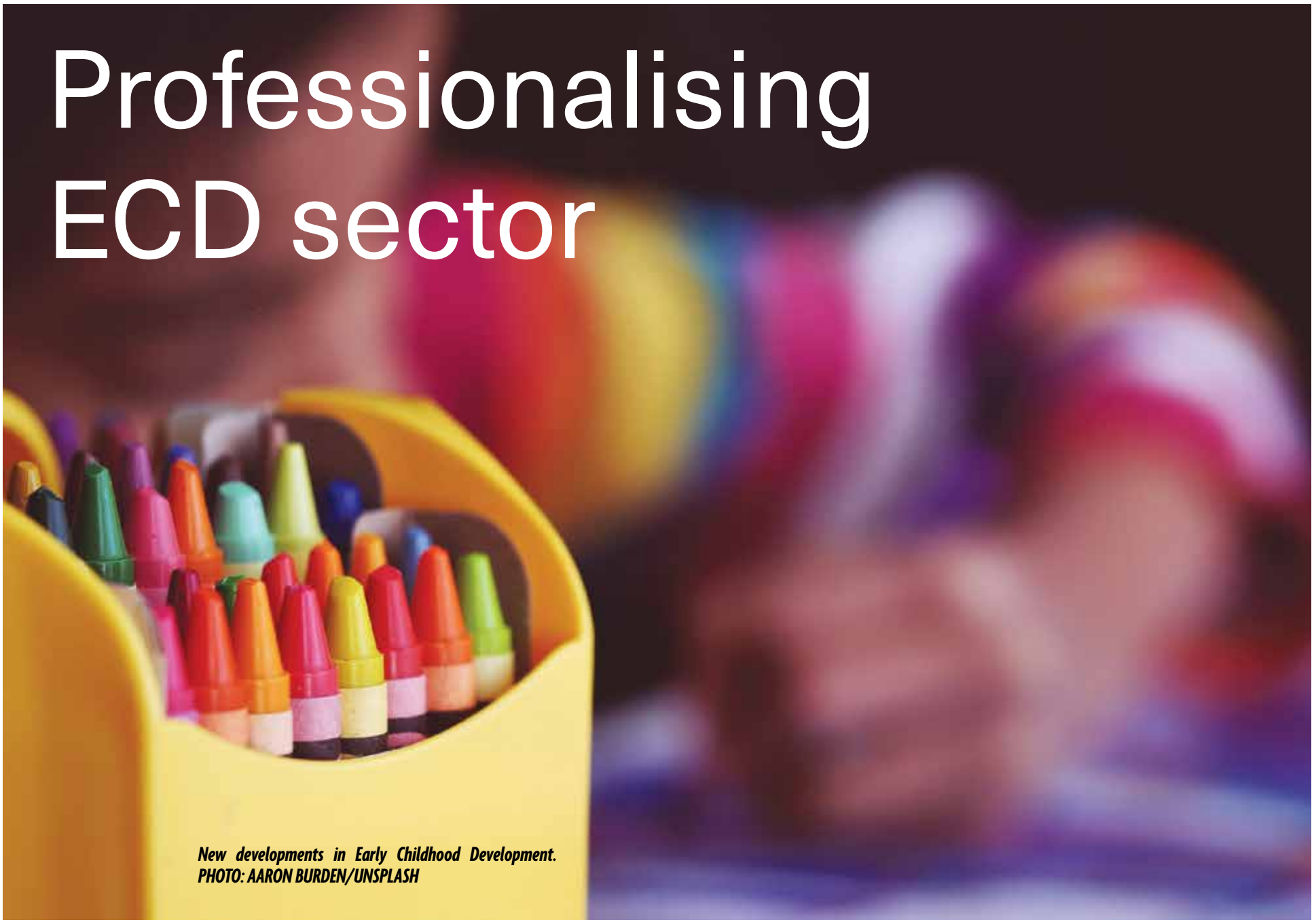
She acknowledged the support offered throughout her journey by many other figures at UCT, such as Bridgette Cloete, Dr Pieter Levecque, Dr Siew Tai, Gabrielle Nudelman, and her research project supervisors, Dr Mariette Smart and Associate Professor Kirsten Corin. Sarah also received a lot of assistance from UCT's Careers Service, her tutors, and her friends at UCT. Her church community was also a great source of encouragement.

She is excited about the next chapter in her life. Sarah loves the DRC and sees the potential to apply there what she learnt in her undergraduate studies. But she is not limiting her choices.

"South Africa has become a second home for me. Opportunities may arise here or elsewhere," she added. She expressed her passion for environmental sustainability where companies think beyond making profits and also preserve the environment. "I draw inspiration from the words of Banksy," she said, "'If you are tired, learn to rest – not to quit.'" – UCT News

ECD Focus

Professionalising ECD sector



New developments in Early Childhood Development. PHOTO: AARON BURDEN/UNSPLASH

The professionalisation of the early childhood development (ECD) sector remains a key priority for the Matthew Goniwe School of Leadership, according to the centre's director of ECD and leadership management, Victor Ngobeni.

Ngobeni said this on the eve of the migration of ECD from the Department of Social Development (DSD) to the Department of Basic Education (DBE). The Gauteng DBE took over all functions relating to ECD in Gauteng as of 1 April 2022.

Early childhood development important

Ngobeni said that early childhood development was crucial because delays in early cognitive and overall development could have long-lasting and costly consequences for children, families and society at large.

He said the government wanted to ensure that by 2030, all children had access to quality ECD, care and pre-primary education, ensuring they were ready for primary school education.

"We are expected to play a key role in the professionalisation of ECD and to ensure there is quality education from the foundation phase onwards," said Ngobeni.

"In many communities today, parents take children to ECD or daycare centres because they want to go to work. But we want to make sure that what is learnt at these centres are standard and inclusive learning opportunities. We also want to ensure that by the time kids arrive at school, challenges such as learning deficiencies are identified and corrected, there and then."

According to the 2019 South African Early Childhood Review, many caregivers have never engaged in key activities that are likely to improve early learning outcomes, such as reading, telling stories or playing with children.

Several crèches and nursery schools across the country are established in townships and rural areas simply because there is a great need for working caregivers, but the founders and teachers of these schools have little or no education or training in ECD.

Director of ECD and leadership management at Matthew Goniwe School of Leadership, Victor Ngobeni. PHOTO: EDDIE MTSWENI

Ngobeni said that in future, the minimum requirements for all ECD practitioners would be raised to NQF Level 4, and NQF Level 6, explaining that there would be no Grade R practitioner with qualifications below an NQF Level 4.

Formal training to be offered

The Matthew Goniwe School of Leadership is currently offering training to ECD practitioners in collaboration with MacMillan and EDT Sector Education and Training Authority (SETA).

"We are also working towards developing a curriculum for managers at all ECD centres. We are looking at professionalising the ECD sector. We are also working in partnership with UNISA and handing over ECD practitioners with NQF Level 4 to incorporate into the Bachelor of Education programme at UNISA."

Training in ECD will include the development of an early learning curriculum, continuity and synergy between early learning and Grade R, integration of key health messages in the school curriculum, and training, implementation and monitoring relating to curriculum implementation for birth to the age of four.

Latest reports by StatSA indicate that access to Early Learning Programmes (ELP) increased over the past 10 years with 69 percent of four-year-olds attending an ELP in 2018.

However, it is not known how many unregistered centres there are. This makes planning the expansion of ELPs problematic, according to industry experts.

ECD Focus

A New Era in Early Childhood Development: Investing in Our Collective Future

"When the democratic government took power 28 years ago, it identified early childhood development (ECD) as a potential strategy for redressing apartheid inequalities. However, with decades of well-funded apartheid preschool and years of underfunded township elementary school education drop-in centers and voluntary kindergartens, the idea that an educated population is the foundation of a strong and just society has continued to elude the Rainbow Nation," writes Panyaza Lesufi.

From DSD to DBE

Fortunately, after years of research and policy formation, including the National Integrated Early Childhood Policy (NIECDP) aimed at providing the necessary information, prioritizing solutions to facilitate social change and ultimately address poverty and inequality, improving child development and the quality of early childhood education, from April 1, 2022, the ECD sector will no longer be managed by the Department of Social Development (DSD), but by the Department basic education (DBE).

So why should the ECD sector be managed by the DBE and no longer by the DSD?

Like many other countries that have moved away from seeing ECD less as a child protection function and more as an early learning function led and coordinated by national ministries of education, this change is a purely administrative process where functions, or roles and responsibilities, are transferred from one minister to another.

This means that the DBE will become responsible for everything that the DSD was responsible for in providing, funding, registering, monitoring and supporting the ECD sector.

Quality ECD Reduced the Achievement Gap

This decision does not take away from the fact that multiple studies conducted around the world indicate that quality early childhood education results in a narrowing of the achievement gap, increased brain development, retention rates and lower special education placements, as well as increased growth in education and social skills acquisition for participating children.

Bridging neuroscience, economics and early childhood, Pat Levitt, director of the neuroscience graduate program at the University of Southern California, says early experiences affect brain architecture.

Levitt rightly argues that just like building a house, when it comes to brain architecture, it's better to get it right the first time than try to fix it later.

Regulation of ECD sector practices

A project management team comprised of DBE and DSD officials and technical and workflow advisors took Levitt's advice and global research to heart and engaged various experts and reviewed required norms and standards, funding systems and processes to register ECD programs, as well as regulate ECD sector practices.

Beginning April 1, the DBE will lead the implementation of the National Curriculum Framework, the National Early Learning and Development Standards, the National Integrated Early Childhood Development Policy, and the Policy on minimum requirements for programs leading to higher education qualifications for early childhood development educators.

Consistent research demonstrates that quality early learning programs reduce disadvantage and lead to fewer behavioral problems, improve academic achievement, increase high school graduation rates, and reduce criminal activity.

Long-term benefits of ECD programs

Investing in early childhood education and a high-quality learning experience for our youngest generates long-term benefits and returns for students enrolled in ECD programs and for the community.

It should be remembered that, based on evaluations of well-designed programs, a child's early years are critical for character development.

It has been shown that children who participate in ECD programs tend to do better in school, are more socially and emotionally competent, show better verbal, intellectual and physical development during early childhood than those who are not enrolled. to high quality programs.

Indeed, time and time again, research has shown that children who lack literacy and language skills in third grade will not catch up.

Studies and research have shown that for every penny invested in particular types of early childhood programs, the government saves money by not having to spend additional funds on future social and educational services for children. who benefited from the program. Therefore, properly funded programs will save you, the taxpayer, and money.

Panyaza Lesufi

Indeed, it is common knowledge that children who receive quality early childhood education are more likely to graduate from high school, pursue higher education, and earn salaries and benefits. higher for life. They are also less likely to abuse alcohol and drugs, commit crimes, or depend on public assistance.

Other benefits include:

- Higher intelligence scores.
- Less repetition and lower dropout rates.
- Improved parent-child relationships.
- Economic self-sufficiency in the future.

Indeed, changing the ECD function from DSD to DBE will improve the quality of early childhood development.

Rationalization of the education continuum

The DBE has developed a 10-year sector plan to ensure that all ECD programs offering early learning and development opportunities are registered and funded by the DBE by 2030.

From an international perspective, there is no doubt that consolidating early learning within DBE would streamline the continuum of education and create positive pressure for greater allocation of resources to ECD as a mechanism. prevention of the educational disparities that we currently see in the basic phase classrooms and beyond.

The DBE will be responsible for ensuring universal availability, adequate quality and equitable access to inclusive learning opportunities for children ages birth through the year before they enter formal school.

Indeed, the DBE will fulfill this responsibility through the development, delivery, regulation, registration, quality monitoring, improvement and evaluation of early childhood development programs.

Strong family values and ECD

High quality early childhood programs can be life changing. We applaud the dedicated teachers and early childhood advocates who work tirelessly to give children a healthy start in life.

In our country, about 180,000 EDC teachers work with about 2.5 million children; and they are in direct contact every day. As parents, let's remember that it's not their only job.

When home and early childhood care and education environments are safe, responsive, language-rich and promote a variety of learning experiences, children thrive.

Of course, as educators, we understand that all parents want to foster positive and healthy growth and development in their children.

Yet not everyone has equal access to the resources that make it possible. The vitality of any nation rests on the commitment and engagement of its people.

An engaged citizenship, a culture defined by strong family values, animates the dynamism of parents and communities.

When parents know what to look for in their child's development and what to do to support it, they are better able to meet the needs of their children. Improving parenting skills also improves employability and economic stability.

The power of proactive parent-teacher partnerships in ECD will shape our children's educational trajectory toward success in school and in life.

Heed the advice of business magnate, software developer, investor, author, and philanthropist, Bill Gates, when he said, "The first five years have a lot to do with how the next 80 will turn out."

Invest in early childhood. Invest in our collective future.

- *Panyaza Lesufi is Gauteng member of the Education Executive Council*
- *First published in Parenting24.*

Revisions

SENIOR SECONDARY IMPROVEMENT PROGRAMME 2013

education
Department: Education
GAUTENG PROVINCE

GRADE 12

PHYSICAL SCIENCES

LEARNER HOMEWORK SOLUTIONS

TABLE OF CONTENTS

LEARNER HOMEWORK SOLUTIONS

Revisions

GAUTENG DEPARTMENT OF EDUCATION **SENIOR SECONDARY INTERVENTION PROGRAMME**

PHYSICAL SCIENCES **GRADE 12** **SESSION 8** **(LEARNER HOMEWORK SOLUTIONS)**

HOMEWORK SOLUTIONS : SESSION 8
TOPIC: CHEMICAL EQUILIBRIUM

QUESTION 1

1.1 The forward reaction is exothermic. ✓Thus, lowering the temperature favours the forward, exothermic reaction and the ammonia will now have a higher yield. ✓ However, the rate of reaction will be lowered and this will lead to the ammonia production being unprofitable. ✓ (3)

1.2.1

	NH_3	O_2	NO	H_2O
Initial concentration ($mol \cdot dm^{-3}$)	1	1	0	0
Change in concentration ($mol \cdot dm^{-3}$)	0,25	0,3125	0,25	0,375
Equilibrium concentration ($mol \cdot dm^{-3}$)	0,75✓	0,6875✓	0,25✓	0,375✓

$K_c = \frac{[NO]^4[H_2O]^6}{[NH_3]^4[O_2]^5}$ ✓

$= \frac{(0,25)^4(0,375)^6}{(0,75)^4(0,6875)^5}$ ✓✓

$= 2,2 \times 10^{-4}$ ✓✓ (9)

1.2.2 Low. ✓ The small equilibrium constant value indicates that the equilibrium lies towards the reactants side ✓ and that there are more reactant molecules in the reaction mixture at equilibrium, thus NO will have a low yield. ✓ (3)
[15]

GAUTENG DEPARTMENT OF EDUCATION **SENIOR SECONDARY INTERVENTION PROGRAMME**

PHYSICAL SCIENCES **GRADE 12** **SESSION 8** **(LEARNER HOMEWORK SOLUTIONS)**

QUESTION 2

	N_2	O_2	NO
Initial number of mole (mol)	7	2	0
Number of moles used/formed (mol)	0,2	0,2	0,4
Number of moles at equilibrium (mol)	6,8	1,8	0,4
Equilbrium concentration ($mol \cdot dm^{-3}$) c = n/V	3,4✓	0,9✓	0,2✓

$K_c = \frac{[NO]^2}{[N_2][O_2]}$ ✓

$= \frac{(0,2)^2}{(3,4)(0,9)}$ ✓

$= 0,013$ ✓ **[6]**

Revisions

GAUTENG DEPARTMENT OF EDUCATION SENIOR SECONDARY INTERVENTION PROGRAMME

PHYSICAL SCIENCES GRADE 12 SESSION 9 (LEARNER HOMEWORK SOLUTIONS)

HOMEWORK SOLUTIONS: SESSION 9
TOPIC: ELECTROLYTIC AND GALVANIC CELLS

QUESTION 1

1.1.1 $Fe \rightarrow Fe^{2+} + 2e^-$ √√ (2)

1.1.2 Oxygen √ (1)

1.1.3 $E^{\theta}_{cell} = E^{\theta}_{cathode} - E^{\theta}_{anode}$ √
$= 0,4$ √ $– (-0,44)$√
$E^{\theta}_{cell} = 0,84$ V √
Because the emf is positive, the reaction is spontaneous. √ (5)

1.1.1 Mg is a stronger reducing agent √than Fe and will be oxidised √ (2)
Or Mg loses electrons more easily than Fe and becomes oxidised.
Or Fe is a weaker reducing agent than Mg and will not be oxidised.

1.2.2 Electrolytes in the soil √√or salts dissolved √in the moist soil. √ (2)

1.2.3 Mg is oxidised or becomes corroded or used up. √ (1)

1.2.4 $Mg \rightarrow Mg^{2+} + 2e^-$ √√ (2)

1.2.5 Any two:
- Paint√
- Electroplating√
- Oil or waterproofing
- Galvanising
- Plastic coating (2)

1.2.6 Advantage: ANY ONE:
- Plastic is cheaper√
- Does not rust

Disadvantage: Any one:
- Not degradable√
- Not as strong as iron (2)

[19]

Revisions

GAUTENG DEPARTMENT OF EDUCATION SENIOR SECONDARY INTERVENTION PROGRAMME

PHYSICAL SCIENCES GRADE 12 SESSION 10 (LEARNER HOMEWORK SOLUTIONS)

HOMEWORK SOLUTIONS: SESSION 10

TOPIC: CONSOLIDATION EXERCISES ON MECHANICS AND MATTER AND MATERIALS

QUESTION 1

1.1 $W = hf$ ✓$= 6,63 \times 10^{-34} \times 9,4 \times 10^{14}$✓
$= 6,2 \times 10^{-19}$J✓ (3)

1.2 $hf = W + E_K$ ✓

$6,63 \times 10^{-34}$ ✓ $\times 2,2 \times 10^{15}$✓ $= 6,2 \times 10^{-19} + E_K$✓

$E_K = 8,39 \times 10^{-19}$ J✓ (5)

1.3 $E_K = ½ mv^2$ ✓
$8,32 \times 10^{-19}$✓ $= ½ (9,1 \times 10^{-31}) v^2$ ✓ (m is the mass of an electron)

$v = 1,35 \times 10^6$ m·s^{-1} ✓ (4)

[12]

QUESTION 2

2.1 $W = hf$ ✓$= 6,63 \times 10^{-34} \times 4,47 \times 10^{15}$✓
$= 2,96 \times 10^{-19}$J✓ (3)

2.2 $v = \lambda f$ ✓
3×10^8 ✓$= (234 \times 10^{-9})f$✓

$f = 1,3 \times 10^{15}$ Hz ✓

$hf = W + E_K$ ✓

$6,63 \times 10^{-34} \times 1,3 \times 10^{15}$ ✓$= 7,3 \times 10^{-19} + E_K$ ✓

$E_K = 1,32 \times 10^{-19}$ J✓ (8)

[11]

QUESTION 3

The longer wavelength of the star in comparison to the sun suggests red shift. ✓ This is the Doppler effect ✓in relation to light. As the star moves away from the earth, ✓the waves spread apart✓ so we detect a longer wavelength. ✓ **[5]**

Revisions

GAUTENG DEPARTMENT OF EDUCATION SENIOR SECONDARY INTERVENTION PROGRAMME

PHYSICAL SCIENCES GRADE 12 SESSION 11 (LEARNER HOMEWORK SOLUTIONS)

HOMEWORK SOLUTIONS: SESSION 11
TOPIC: CONSOLIDATION EXERCISES ON SOUND, DOPPLER EFFECT AND LIGHT

QUESTION 1

1.1 The ability of a wave to bend / spread out (in wave fronts)✓ as they pass through a (small) aperture / opening OR around a (sharp) edge/ points /corners / barrier. ✓ (2)

1.2 1.2.1 Angle of / (Degree of) diffraction ✓ (1)

1.2.2 (Slit) width ✓ (1)

1.3 (Slit) 1 ✓
Slit 1 represents the most diffraction. ✓
OR
Diffraction /Angle / sin θ / θ is inversely proportional to slit width. ✓
OR
$\sin\theta \ \alpha \frac{1}{a}$ or $\theta \ \alpha \frac{1}{a}$ ✓
OR
Larger angle at which first minimum for slit 1 is obtained. ✓
OR
Smaller angle at which first minimum for slit 2 is obtained.✓ (2)

1.4

$\sin\theta = \frac{m\lambda}{a}$ ✓

✓ ✓

$\sin 5° = \frac{(1)(410 \times 10^{-9})}{a}$

$\therefore$ a = 4,70 x 10^{-6} m ✓ (0,0000047 m / 4,7 µm)

(4)

[10]

QUESTION 2

2.1 Every point on a wave front acts as a source of secondary wavelets ✓that spread out in all directions ✓with the same speed and the same frequency as the wave. (2)

2.2 As the wave passes through the slit, the slit acts as a source for secondary wavelets, ✓which moves out in all directions, ✓ including the area behind the slit. ✓ (3)

[5]

Revisions

GAUTENG DEPARTMENT OF EDUCATION SENIOR SECONDARY INTERVENTION PROGRAMME

PHYSICAL SCIENCES GRADE 12 SESSION 12 (LEARNER HOMEWORK SOLUTIONS)

HOMEWORK SOLUTIONS : SESSION 12
TOPIC: CONSOLIDATION EXERCISES ON ORGANIC MOLECULES AND THEIR REACTIONS

QUESTION 1

1.1 Structural isomers are organic molecules that have the same molecular formulae but different structural formulae. ✓✓

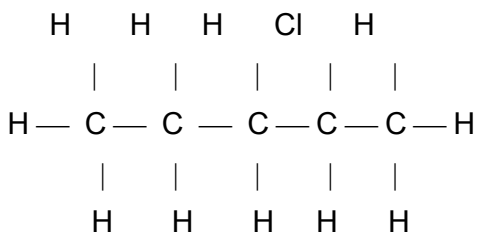
1.2 All members of a homologous series obey the same general formula ,i.e. they have the same number of carbon and hydrogen atoms if it is a hydrocarbon, e.g., alkanes have a general formula of C_nH_{2n+2}. ✓✓

1.3 All the organic molecules in a homologous series have the same functional group, and they obey the same general formula. ✓✓

1.4 A functional group is a bond or an atom or a group of atoms that all the members of the homologous series have in common. ✓✓ **[8]**

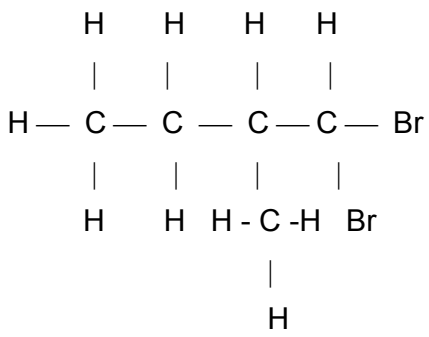
QUESTION 2

2.1



✓✓

2.2



✓✓

[4]

QUESTION 3

3.1 A and D ✓✓
3.2 A and B ✓✓
3.3 C ✓✓
3.4 E ✓✓ **[8]**

Revisions

GAUTENG DEPARTMENT OF EDUCATION SENIOR SECONDARY INTERVENTION PROGRAMME

PHYSICAL SCIENCES GRADE 12 SESSION 13 (LEARNER HOMEWORK SOLUTIONS)

HOMEWORK SOLUTIONS: SESSION 13
TOPIC: CONSOLIDATION EXERCISES ON RATES, CHEMICAL EQUILIBRIUM AND ELECTROCHEMISTRY

QUESTION 1

1.1 silver√√ (2)

1.2 Ni (s) → Ni^{2+} (aq) + $2e^-$ √√ (2)

1.3 silver√√ (2)

1.4 Ni(s)/Ni^{2+}(aq), 1 mol·dm^{-3} // Ag^+ (aq), 1 mol·dm^{-3} /Ag

√ √ √ (3)

1.5 $E^{\theta}_{cell} = E^{\theta}_{cathode} - E^{\theta}_{anode}$ √

= 0,80 √ – (-0,25)√

E^{θ}_{cell} = 1,05 V √ (4)

[13]

QUESTION 2

2.1 C
2.2 D
2.3 B
2.4 D
2.5 C
2.6 D
2.7 C
2.8 B
2.9 C
2.10 C
2.11 B
2.12 C
2.13 A (13 x 2) **[26]**

GAUTENG DEPARTMENT OF EDUCATION SENIOR SECONDARY INTERVENTION PROGRAMME

PHYSICAL SCIENCES GRADE 12 SESSION 14
(LEARNER HOMEWORK SOLUTIONS)

HOMEWORK SOLUTIONS: SESSION 14
TOPIC 1: ELECTROSTATICS - GRADE 11 REVISION

QUESTION 1

1.1 ✓

$$F = \frac{kQ_1Q_2}{r^2} = \frac{(9\times10^9)(4\times10^{-6})(6x10^{-6})}{(0.4)^2} = 1.35\text{ N}$$ ✓ ✓ ✓

(4)

1.2 Four ✓ (1)

1.3 E (6μC) = kQ/r^2 ✓ ✓

= (9 x 10^9) (6 x 10^{-6})/(0.,2)^2 ✓

= 1,35 x 10^6 N·C^{-1} to the left.

E (4μC) = kQ/r^2 ✓

= (9 x 10^9) (4 x 10^{-6})/(0.,6)^2 ✓

= 1 x 10^6 N·C^{-1} to the right.

Take to the right as positive:

E_{net} = - 1,35 x 10^6 + 1 x 10^5 = - 1,25 x 10^6 N·C^{-1}
= 1,25 x 10^6 N·C^{-1} to the left ✓ (6)

1.4 New charge = (+4x10-^{6}) + (-6x10^{-6})/2 = -1 x 10^{-6} C ✓

U = kQ_1Q_2/r ✓
= (9 x 10^9)(-1 x 10^{-6})^2 ✓/0,4 ✓
= 2,25 x 10^{-2} J ✓ (5)
[16]

Revisions

GAUTENG DEPARTMENT OF EDUCATION SENIOR SECONDARY INTERVENTION PROGRAMME

PHYSICAL SCIENCES GRADE 12 SESSION 14 (LEARNER HOMEWORK SOLUTIONS)

QUESTION 2

2.1 The current through a conductor is directly proportional to the potential difference across its ends at constant temperature. ✓✓ (2)

2.2 Equal ✓

2 A divides equally at T (and since I_M = 1 A it follows that I_N = 1 A) ✓

OR

$I \alpha \frac{1}{R}$, $\therefore R_M = R_N$ (2)

2.3 emf = IR + Ir ✓$\therefore$ 17 = 14 + Ir ✓$\therefore$ Ir = 3 V

$r = \frac{V_{lost}}{I}$ ✓= $\frac{3}{2}$ ✓ = 1,5 Ω ✓ (5)

2.4 $V_N = IR_N$ ✓= (1)(2) ✓= 2 V ✓ (3)

2.5 V_Y = 14 – 2 = 12 V ✓

$V_Y = IR_Y$ ✓$\therefore$ 12 = (2)R_Y ✓

$\therefore R_Y$ = 6 Ω ✓ (4)

[16]

GAUTENG DEPARTMENT OF EDUCATION SENIOR SECONDARY INTERVENTION PROGRAMME

PHYSICAL SCIENCES GRADE 12 SESSION 15 (LEARNER HOMEWORK SOLUTIONS)

HOMEWORK SOLUTIONS: SESSION 15

TOPIC: ELECTRODYNAMICS - MOTORS AND GENERATORS AND ALTERNATING CURRENT

QUESTION 1

1.1 C
1.2 B
1.3 D
1.4 D
1.5 C

(5 x 2) **[10]**

QUESTION 2

2.1 There will be more current, more movement results. √ √ (2)

2.1.1 To stop the current briefly every 180º and to swop the directon of the current every 180º. √ (1)

2.1.2 To allow for free rotation of the coil. √ (1)

2.2 Yes. √ More current can be run through the coil. √ (Changing the number of coils or the strength of the magnets would be changing the actual structure of the motor.) (2)

2.3 A motor converts electrical energy into kinetic energy √ and a generator converts kinetic energy into electrical energy. √ In a motor the current needs to be provided and movement is created. In a generator the movement needs to be provided and a current is produced. (2)

2.4 More interaction of the magnetic field causes the conductor to have more current induced in it. √ So the faster the movement, the greater the current. √ (2)

[10]

QUESTION 3

3.1 $I = I_0 \sin\omega t$ √ √ or $I = I_0 \sin 2\pi ft$ (2)

3.2 $I_{RMS} = I_0 / \sqrt{2}$ √ √ (2)

3.3 $V_0 = \sqrt{2}\ V_{RMS}$ √ = 1,414 x 240 √ = 339,36V√ (3)

3.4 The average value of the current over the cycle is zero and no useful power is delivered. √ √ (2)

[9]

Sports

The programme will be implemented in 1270 no-fee paying schools in the Gauteng province during the Mid-term period. PHOTO: SUPPLIED

Gauteng Sports, Arts, Culture and Recreation and Gauteng Department of Education introduce schools Wednesday Integrated Programme

BY STAFF WRITER

THE Gauteng Department of Sports, Arts, Culture and Recreation in partnership with the Gauteng Department of Education have introduced a new indicator, the schools Wednesday Integrated Programme (WIP) for Sports, Arts and Culture, affectionately referred to as the "Wednesday League".

The Central Corridor instalment of the Schools Wednesday Integrated Programme Launch took place on Tuesday last week at the Moletsane Sports Complex in Soweto.

The programme consisted of several exciting activities and entertainment such as a live band and a special performance by Yanga Chief as well as a special guest appearance from Lebo "Shugasmakx" Mothibe, best known as the co-founder and star of iconic hip-hop brand Skwatta Kamp.

The event was also graced by some of South Africa's renowned legends such as Kaizer Chiefs attacking mid-fielder Lebogang Manyama, Ramehlwe Mphahlela, Kaizer Chiefs Defender, Manti Moholo, former Orlando Pirates player as well as Siboniso Pa Gaxa, former Bafana Bafana and Kaizer Chiefs Defender, the presence of these amazing soccer stars served as great inspiration for the students who look up to them.

The programme kicks off with an inclusion of arts and culture activities simultaneously implemented in schools and is aimed at establishing a vibrant hype of activities in form of school leagues and festivals championed from all the no-fee-paying schools across the Gauteng province.

The programme will be implemented in 1270 no-fee paying schools in the Gauteng province during the Mid-term period.

381 schools have already benefitted in the initial stages of the programme and 410 schools will be supported in the 2022/23 financial year.

The Arts and Culture unit also has schools that are supported under this programme.The department said it intends to host an integrated launch at a Provincial scale with subsequent Wednesday League Launch Corridor Roadshows which will kick-start the awareness for the Netball World Cup that will be hosted in South Africa in 2023.

This will also assist the department in rolling out the integrated Sport and Arts and Culture programmes in schools during the 2022/2023 FY and beyond.

- Inside Education

King's College welcomes former Bafana Bafana defender as head of sport

STAFF WRITER

THE King's College and Preparatory School started the year with a new executive of sports, who is also a former Bafana Bafana player.

Ricardo Katza represented South Africa from 2005 to 2010 in which he captained the side for eight matches during his tenure in the national team.

The former footballer said he was contacted by a member of the Board of Governors at The King's College in August last year. "I last spoke to him in 2017. When he mentioned that the head of sports left the post, I was the first one who came to his mind.

"[It also] offered me and my family a three-in-one situation (school, sports and church) on one campus," he said.

Katza said there are a number of goals he hopes to achieve at the school in his new position. He mentioned there have been challenges, but change is taking place on a solid foundation.

"We have decided to work on three things this year. [We want to] work with children as people and not just as athletes who do sport at the school. We want to improve and raise the standards of the nine sporting codes, to get the learners to compete and not just participate. With our coaching staff, we want to have staff with qualifications per sporting code and heading the nine different sports."

Looking to the future, Katza is looking to obtain his Union of European Football Associations A and B football coaching licence next year in Ireland.

- Fourways Review