*Date:* 24 May 2024

*Time:* 08:00-14:00

*Venue:* PGS Training Room, Akanya Building
Auckland Park Kingsway campus

# Visualise *your* thesis™

a programme for graduate researchers

## Research Capacity Development

### POSTGRADUATE SCHOOL

**Our Future**
Reimagined

# A word of welcome from the Director of the Research Capacity Development Unit
## Professor Penny Govender

*Dear esteemed colleagues and budding researchers,*

*On behalf of the Research Capacity Development unit at the Postgraduate School, University of Johannesburg, it is my distinct pleasure to welcome you to this year's local Visualise Your Thesis (VYT) competition. This event represents a unique opportunity for postgraduate students pursuing a Master's in research, Masters in Philosophy and Doctoral degrees to showcase the innovative research they are conducting in a creative and engaging format.*

*Essentially, students are provided with a platform to refine their communication skills, translate complex research findings into accessible visuals, and share the impact of their work with a wider audience. We believe that this competition will not only inspire students to think outside the box but also equip them with valuable skills that will serve them well throughout their research careers.*

*We extend our sincere gratitude to our esteemed panel of judges for their time and expertise in evaluating the students work. We also acknowledge the invaluable contributions of the organizing committee from the University of Johannesburg, who have worked tirelessly to make this event possible. We are especially grateful for the collaboration with the University of Melbourne as our international team, whose expertise and support have been instrumental in shaping this competition.*

*To all participants, we wish you the very best in this competition. We are excited to witness your creativity, passion, and dedication come to life through your visual presentations.*

*Sincerely,*

*Prof Penny Govender*

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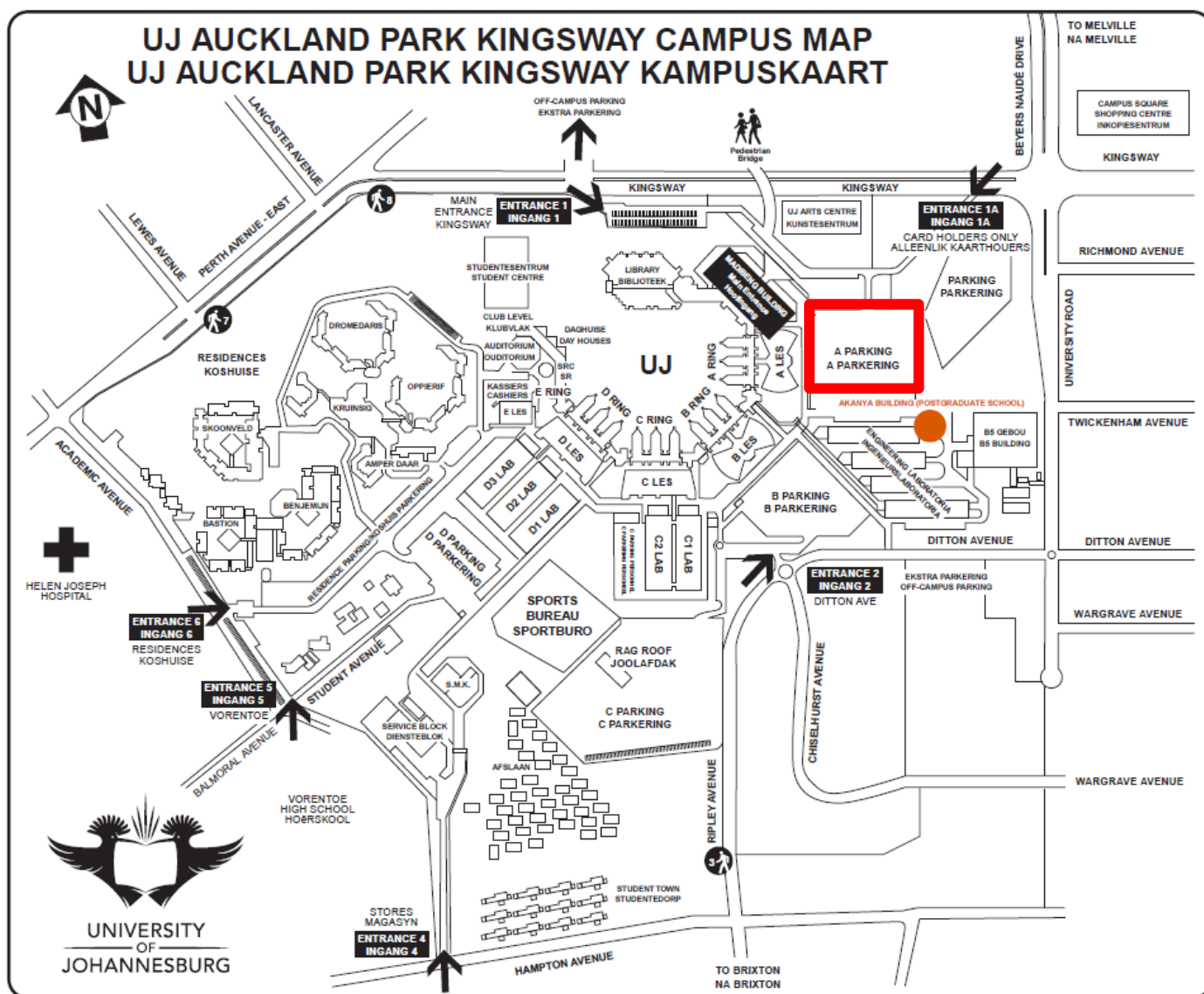
# Venue Information

The 2024 local VYT competition will be held at the Postgraduate School Training Room, Akanya Building, Auckland Park Kingsway Campus, University of Johannesburg.

**Parking for external guests:** Provided directly outside the Postgraduate School, Akanya Building. Please inform the security guard of the event and venue you are attending by producing your letter of invitation.

**Water, Tea and Coffee** will be provided during the break (Please see programme on page 7).

**Lunch:** Buffet style – served at the venue between 12:00-14:00.

**Please see entrances marked with black arrows, parking for external guests (A Parking – highlighted in red) and location of venue (marked by orange dot) on our campus map.**

# General Information

## Attendee Registration

- When you arrive – please sign in at the registration table.
- You will receive an event **goodie bag** which will contain:
  - **Name tag** – please wear this throughout the day, to be identified by event attendees and venue.
  - Event Programme
  - Feedback Survey
  - Assorted gifts

## Online Audience

- **Facebook Live Streaming:** @UJPostgraduateSchool
- **Zoom Webinar Session:** links sent directly to members following registration.
- Once in Zoom webinar session, please ensure your mic is muted and your camera is switched off.
- For the schedule on presentation sessions (See programme on page 7 for assigned presentations and times).

## Event feedback

- Please take the time to complete and submit the event feedback form before the event ends.
- For physical audience, a feedback form will be provided to you at registration and collected at the end of the event.
- For online audience, please see link and QR code below for digital feedback form. If using a phone, please ensure to scroll across the screen to view all rating options.

2024 local VYT competition (UJ)- Online Audience Feedback Survey

**Link:** Click here

**QR code**

Open the built-in camera app on your phone.
Point the camera at the QR code.
Tap the banner that appears on your phone.

## Disclaimer

All entrants were requested to revise their abstract submissions as per the abstract template provided prior to compilation of the Book of Abstracts. It is also assumed all abstracts were checked and submitted with the approval of supervisors and co-supervisors. Abstracts published as is and not in the correct template means that the entrant did not comply with the instructions issued from the organizing committee and updated abstracts were unavailable at the time of publication of the Book of Abstracts. All attendees were previously notified and agreed to the terms and conditions of the event: By attending this event, you grant the University of Johannesburg permission to use and publish any recorded material taken during the event (photos, videos etc.).

# Prizes

| First Place | Second Place | Third Place | People's Choice Award |
|---|---|---|---|
| R 10 000 | R 7 000 | R 5 000 | R 3000 |

\* All winners will receive trophies and presentation cheques.

\*Award and participation certificates, as well as cash prizes will be paid to recipients after the competition-   date to be confirmed and communicated

# People's Choice Award Voting

The People's Choice Award Voting will be made available at 10:30 and will close at 11:00. Voting will be done online using the link or QR code provided below. Voting is available to both the event attendees and the online audience.

- If using a phone, please ensure to scroll across the screen to view all rating options.

**Link**

[Click here](#)

**QR code**

Open the built-in camera app on your phone.
Point the camera at the QR code.
Tap the banner that appears on your phone.



2024 local VYT Competition (UJ) – People's Choice Award Voting

# 2024 local Visualise Your Thesis (VYT) Competition

# Event Programme

| Time | Activity | Participant number and name |
|---|---|---|
| 08:00-08:30 | **Arrival** | **Participant number and name**<br><br>1. Isac Mabunda<br>2. Candice Schaal<br>3. Thérèse Bikaya Enjili<br>4. Mariam Jacob<br>5. Kamvelihle Bili<br>6. Izak Frederik Potgieter<br>7. Kave Moloudi<br>8. Dumisani Lucky Mgidi<br>9. Shobana Nagaraj<br>10. Timileyin Peter Abiodun<br>11. Bonolo Mashigo<br>12. Thabang Johannes Nkosi<br>13. Mapaseka Ntintiseng Khanye<br>14. Yollanda Yeukai Washaya<br>15. Yusuf Ola Mukaila |
| 08:30 – 08:40 | **Opening and Welcome** – Dr Richard Devey (Director: STATKON) | |
| 08:40-08:50 | **Description of the VYT Competition and Introduction of Judges** – Dr Shandré Pillay (Master of Ceremonies) | |
| 08:50-09:00 | **Keynote Address** – Ms Minenhle Maphumulo<br>First place winner -2023 local VYT competition (UJ) and Second place winner – 2023 National VYT competition (RSA) | |
| 09:00-09:25 | VYT Presentations and Questions & Answer Session – **Participants 1-5**. Five minutes per participant. | |
| 09:25-09:30 | **Break** | |
| 09:30-09:55 | VYT Presentations and Questions & Answer Session – **Participants 6-10**. Five minutes per participant. | |
| 09:55-10:05 | **Audience Competition Quiz and Prize Award** | |
| 10:05-10:30 | VYT Presentations and Questions & Answer Session – **Participants 11-15**. Five minutes per participant. | |
| 10:30-11:00 | **Judge's Plenary Break-Away Session and Audience People's Choice Poll** | |
| 11:00 – 11:10 | **Audience Competition Quiz and Prize Award** | |
| 11:10-11:30 | **Awards and Gift Giving Ceremony** – Judges | |
| 11:30-11:40 | **Vote of Thanks and Closure** – Dr Shandré Pillay (Master of Ceremonies) | |
| 11:40-12:00 | **Group Photos and Networking** | |
| 12:00 – 14:00 | **Lunch** | |

# Meet Your Keynote Speaker



Ms Minenhle Maphumulo Minenhle is currently a final year PhD candidate in geology at the University of Johannesburg and holds an MSc geology degree from the University of Johannesburg, obtained with distinction, a BSc (honours) and BSc degree also in geology from the University of KwaZulu-Natal. She specializes in mineralogy, geochemistry, and igneous petrology of rare metal pegmatites. Minenhle has also presented both her master's and current PhD research at various local and national conferences. She has also been on the national television news segment (SABC) to discuss a geologist's perspective on issues such as illegal mining in South Africa and attended the Mining Indaba (Youth Program) that aimed to inquire the youth in geosciences about the future of mining. Minenhle has won two awards at the 2023 local VYT competition (1st place and people's choice award) and one award at the 2023 National VYT competition (2nd place), these competitions were aimed at translating scientific research for a non-specialized audience.

# Meet Your Judges

## *Head Judge*



**Prof Karabo Sitto-Kaunda** holds the position of Associate Professor in the Department of Business Management at the University of Pretoria. Karabo instructs at both undergraduate and postgraduate levels, and she has experience supervising postgraduate students. Her research interests encompass digital and online communication, convergence in health communication, identity, social representations, and pedagogical approaches to teaching and learning.

## *Judges*

**Prof Lawrence Ogechukwu Obokoh** (PhD, MBA, FCA) is the Director of MBA programmes, Professor of Finance and Small Business Development, a Chartered Accountant and Fellow of the Institute of Chartered Accountants of Nigeria (ICAN). He obtained his PhD from University of Wales, Aberystwyth (now Aberystwyth University), United Kingdom and his MBA with Cum laude from Obafemi Awolowo University, Nigeria where he started his academic career as a Graduate Assistant and rose to the rank of a full Professor in 2015. He is the coordinator of the Capstone project and coordinator of the post-doctoral fellowship programme at JBS. He has published numerous journal articles and examined master's and PhD thesis for various universities.

**Dr Lee-Ann Modley** Senior Lecturer and Deputy HoD in the Department of Geography, environmental management and energy studies. She has a demonstrated history of 10 years working in the higher education industry with PhD and current research focus is in Environmental Science focusing on Aquatic health from the University of Johannesburg. Currently the Local Director of South Africa (UJ) for the Erasmus Mundus Masters in Sustainable Territorial Development and Una Europa - Virtual Exchanges for Sustainability, member of the Scientific Advisory Board of RIMM Sustainability, based in Singapore, the Green v2.tool task force for Green building council of South Africa and Jean Monnet Center of Excellence on Climate Justice at the University of Padova, Italy. Dr Modley was part of the M&G Top 200 Young South Africans 2022 cohort and an active member of the National and International Young Water Professionals committee.

**Prof Anthony Ambala** is the Vice Dean Research and Internationalisation (Acting) at FADA. His current research interests are in participatory, inclusive, interactive and immersive media from an Afrikan lens, focusing on marginalized, co-opted and 'othered' communities, and working within film, digital, gamified, virtual reality and other visual media spaces.

**Prof IIse Struweg** is an Associate Professor in the Department of Marketing Management at the University of Johannesburg since 2018. She brings 20 years of experience and expertise in marketing, communication and supervision. She previously held a position of Head of School of Business and Economics at Monash University, Australia (South Africa), who recognised her with an "Exceptional Achievement Award". At age 27, She earned a PhD in strategic integrated communication and since then, supervised research students at various levels. The recognition underscores her dedication to research coaching and mentoring, with interests spanning integrated Marketing Communication, Consumer Behaviour and Research Methodology. Prof Struweg's contributions have been acknowledged by reputable media outlets such as BBC World News, The Conversation, and The Citizen where she shares opinion pieces and insights.

**Dr Hellen Agumba** currently works as a lecturer at the Department of Education and Curriculum Studies, University of Johannesburg. She holds a PhD and Master's in Education and Curriculum Studies. She has worked on several national and international projects including the TAU Programme, SARIHE, and Zenex, with funding from ESRC, NRF & Department of Higher Education & Training (DHET), South Africa. Hellen research interest is in the learning experiences of students in Higher Education with a keen focus on marginalised students and advancing the discourse of social justice in higher education and beyond. Other research areas include teacher professional development, curriculum development, policy evaluation, commerce education, and assessment. She has published some of her work in reputable journals and various national and international conferences.

**Prof Thandiwe Sithole** is an Associate Professor in the Department of Chemical Engineering within the esteemed Faculty of Engineering and the Built Environment at the University of Johannesburg. As an esteemed alumna of our university, Prof. Sithole has been chosen to represent the University of Johannesburg in the highly anticipated U21 Early Career Researcher (ECR) Workshop 2024, hosted at the University of Queensland, Australia. With an international reputation for excellence, Prof. Sithole has showcased her groundbreaking research across the globe, captivating audiences in China, Australia, Singapore, India, and Thailand. Her unwavering dedication and passion have firmly established her as a leading researcher in the field of Environmental Engineering.

**Dr Charissa Fawole** is a Lecturer in the Department of Public Law at the University of Johannesburg. She holds a BA (Honours) in International Relations and Development Studies and a JD from the University of Windsor in Canada. She obtained an LLM and LLD from Stellenbosch University. She was called to the bar in 2010 and remains a member in good standing with the Law Society of Ontario. Dr Fawole was also a visiting research lawyer at the Kenyan Section of the International Commission of Jurists from 2010 to 2011. She then went on to practice law in the area of civil litigation. Dr Fawole has since transitioned her legal career from practice to legal academia. Her research focuses on international human rights law, international children's rights, human rights accountability, and forced migration with a focus on internally displaced children in Africa. She is a member of the Global Network on Internal Displacement in Africa (GENIDA)

**Prof Jonathan Stadler** is full professor of anthropology at the University of Johannesburg and Head of the Department of Anthropology and Development Studies. His research interests are epidemics of infectious diseases, science and technology studies, clinical trials, and animal-human health. He has published two full length monographs based on long term ethnographic research on HIV AIDS and clinical trials in South Africa, and more than 40 articles in peer reviewed journals.

# Participant Abstracts

*Please click on page numbers to take you directly to the participant abstract of interest.

**Name:** Isac
**Surname:** Mabunda
**Faculty:** Science
**Department:** Biochemistry
**Registered degree:** MSc in Biochemistry
**Supervisor(s):** Dr. B. Offor and Prof. L. Piater

**Proteomic variations between African scorpion venoms and identification of therapeutic properties through *in vitro* cell line assays**

Mr. Isac Mabunda, Dr. Benedict Offor, and Prof. Lizelle Piater

Department of Biochemistry, Faculty of Science, University of Johannesburg, Gauteng, South Africa, 2003

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**Keywords:** Antivenom, Cancer, Proteomics techniques, Scorpion envenomation, Therapeutic agents.

Scorpion stings are the second most global cause of envenomation, especially in tropical and subtropical regions, after snakebites. Scorpion envenomation poses a significant public life-threatening problem, with some patients experiencing clinical symptoms and severe complications, including death caused by the components found in scorpion venom, such as neurotoxic proteins [1]. Besides the neurotoxic proteins, scorpion venom consists of bioactive molecules that can be used to develop new therapeutic drugs against cancer and other emerging diseases [2,3]. Antivenoms are the only treatment for envenomation, but they are costly, not easily accessible, and some are ineffective in severe envenomation due to these species' variations [4]. People from subtropical and tropical regions are most affected since they do not have proper healthcare facilities. Currently, there is a shortage of scorpion antivenom, and Southern and Northern Africa are known to be the home of dangerous scorpions that can cause life-threatening problems [4]. Due to the above reasons, this study aims to determine the proteomic profile variations of Southern and Northern African scorpion venoms using proteomic techniques such as one-dimensional (1-D) and two-dimensional (2-D) gel electrophoresis, enzymatic assays, reverse phase high-pressure liquid chromatography (RP-HPLC), and MALDI-TOF which will reveal the intra- and inter-species variance concerning sex, diet, age, geographical location [3,5,6]. Due to the scorpion venom not only being a threat to human health, this study will also focus on finding new therapeutic agents against cancer in scorpion venom. The data obtained will provide a better understanding of the manufacturing of scorpion antivenom serum and potential components that can be used for cancer treatment.

**References**

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**Name:** Candice
**Surname:** Schaal
**Faculty:** Education
**Department:** Educational Leadership and Management
**Registered degree:** PhD in Educational leadership and management
**Supervisor(s):** Prof Chinaza Uleanya

**Leading teacher emotional well-being at low quintile primary schools**

Candice Schaal, Chinaza Uleanya

Department of Education Leadership and Management, UJ

**E-mail: candiceschaal@gmail.com; chinazau@uj.ac.za**

This study investigated the practical implications and roles of school leadership and school support groups regarding teachers' overall emotional well-being from disadvantaged public primary schools in the KwaZulu-Natal region. Bronfenbrenner's ecological systems theory underpins this study, and the research was conducted hereon [1]. A qualitative method was adopted as it focused on the lived and real experiences of the participants. A case study research design was utilised as the aim was to learn more about the roles of different key stakeholders in school with regards to the emotional well-being of teachers [2]. The sample comprised twenty-four participants who partook in the study, nine teachers, nine heads of departments, three deputy principals and three principals from three public primary schools. Group interviews as well as individual interviews were conducted with the participants. The data that was collected was sorted, listened to, and coded. Thereafter, the data were relistened to and various themes as well as sub-themes emerged from the qualitative study data [3]. The findings revealed that despite a clear structure for school administration, there is no real structure to cater for the emotional wellbeing of teachers. The findings also showed that the teachers need for a supportive person, someone to talk to and to debrief with. Teachers are in need of an independent school counsellor who would be able to assist them in their emotional well-being journey. The findings also revealed that teachers, heads of departments as well as the management of schools do not receive support, guidance and assistance with regard to teachers' emotional well-being. Based on the findings of both the literature study as well as the case study recommendations were presented and suggestions for further research were made [4]. Role players, specifically leaders, need to be made aware of the vital role they play in improving and enhancing the emotional well-being of teachers [5]. It is hoped that this study will raise awareness and spark interest in creating policies and procedures to ensure all role players are equipped to support teachers in their emotional well-being journey.

**References**

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**Name:** Thérèse
**Surname:** Bikaya Enjili
**Faculty:** College of Business and Economics (CBE)
**Department:** Industrial Psychology and People Management (IPPM)
**Registered degree:** MPhil
**Supervisor(s):** Dr Jeremy Mitonga-Monga

## The moderating effect of career choice regret on the relationship between employee motivation and organisational citizenship behaviour

Thérèse Bikaya-Enjili

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**Keywords:** Organisational citizenship behaviour, Employee motivation, Intrinsic motivation, Career choice regret

Organisations are under pressure to attract and retain qualified and motivated employees who can demonstrate non-work behaviours such as Organisational Citizenship Behaviour (OCB). Previous studies have shown the influence of motivational factors on organisational citizenship behaviour and the influence of career regret on employee motivation levels. However, the way in which career regret moderates the relationship between employee motivation and organisational citizenship behaviour has not yet been investigated in a developing country such as the Republic Democratic of Congo. The aim of this study was to investigate the moderating effect of career choice regret (CCR) on the relationship between employee motivation (EM) and organisational citizenship behaviour (OCB) in public schools in the eastern province of the Democratic Republic of Congo (DRC). A quantitative research approach with a positivist philosophy was conducted using a cross-sectional design with a convenience sample (N345) of public-school teachers in the Eastern Province of the Democratic Republic of Congo. Perceptions of organisational citizenship behaviour were measured using the Organisational Citizenship Behaviour Questionnaire (OCBQ), motivation was measured using the Work Motivation Inventory, and the career decision regret was measured using the Career Decision Regret Scale. The data were analysed using hierarchical moderator regression analysis to predict organisational citizenship behaviour from employee motivation interacted with career decision regret. The results suggest that intrinsic motivation is related to organisational citizenship behaviour. Furthermore, the results suggest that career decision regret moderates the relationship between intrinsic motivation and organisational citizenship behaviour. The results provide new evidence that an organisation that fosters intrinsic motivation can help its employees disregard negative emotions and promote positive behaviours that drive them to engage in an additional role and allows organisations to maximise competitiveness in a rapidly changing environment. Demonstrating that the association between employee motivation and OCB is different when emotions like career choice regret are involved, the study supports the relational cohesion theory.

**References**

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**Name:** Mariam
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**Faculty:** Science
**Department:** Physics
**Registered degree:** Ph D
**Supervisor(s):** Prof. C. J. Sheppard and Prof. A. R. E. Prinsloo

**Structural and magnetic properties of Co$_{(1-x)}$ Ni$_x$ Cr$_2$O$_4$ , 0 < $x$ < 1  nanoparticles.**

M. Jacob, A. R. E. Prinsloo, and C. J. Sheppard

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**Keywords:** magnetic properties, chromite-based nanoparticles, simulation, superparamagnetism

This study reports on the structural and magnetic properties of Co$_{(1-x)}$Ni$_x$Cr$_2$O$_4$ 0 < $x$ < 1  compounds synthesized through the co-precipitation technique. The structural properties of the samples were studied using x-ray diffraction techniques and are well matched to the CoCr$_2$O$_4$ phase with space group F$d$-3$m$ [1]. The particle size and morphology of the material were obtained through transmission electron microscopy (TEM) and were found to be sensitive to variations in the Ni concentration. The Curie temperature ($T_C$), as well as the spiral order transition temperature ($T_S$), were found to decrease with an increase in Ni concentration.  Magnetization measurements as a function of field, $M(\mu_0 H)$, at different constant temperatures show that the coercivity decreases with an increase in temperature. The shape of the $M(\mu_0 H)$ curve measured at temperatures just above $T_C$ reflects the superparamagnetic nature of the particles, while the small hysteresis is indicative of their ferrimagnetic nature. To determine the contribution of the various magnetic phases, the experimental data were fitted with the following equation [2, 3]

$$M = M_S\left(\left(\frac{2}{\pi}\right)\left\{\arctan\left[\frac{H + H_C}{H_C}\right]\tan\left(\frac{\pi S}{2}\right)\right\}\right) + M_P^S\left[\cot\left(\frac{\mu H}{kT}\right) - \left(\frac{\mu H}{kT}\right)^{-1}\right] + \chi H. \qquad (1)$$

Here the first term represents ferromagnetic, the second term the superparamagnetic and the third the paramagnetic contributions to the magnetization ($M$). $M_S$ is the saturation magnetization of ferrimagnetic part, $H$ is the applied field, $H_C$ is the coercivity, $S$ is the squareness ratio,  $M_P^S$ is the saturation magnetization due to the superparamagnetic part, $\mu$ is the magnetic moment per particle, $k$ is the Boltzmann constant, $T$ is temperature and $\chi$ is paramagnetic susceptibility. Results indicate that the superparamagnetic particles contribute significantly to the saturation magnetization. The $M(\mu_0 H)$  curves were also simulated with the modified Langevin function, considering the log-normal magnetic moment distribution. The particle size obtained from these fittings and TEM are comparable; however, the differences in these values can be attributed to the distribution of particle sizes.

### References

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**Name:** Kamvelihle
**Surname:** Bili
**Faculty:** Humanities
**Department:** Communication and Media
**Registered degree:** Masters in Journalism (Research)
**Supervisor(s):** Antoinette Hoffman

**The Role of AI in Assisting Climate Reporting by Media in Southern Africa**

Kamvelihle Bili

Communication and Media

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This study aims to investigate the use of AI in Radio News Creation while reporting climate change in Southern Africa. With climate change seeming to hit Africa harder than many other parts of the world, it is crucial to address the unique challenges faced in the region (1). By using Lippmann's Agenda Setting Theory, the study will explore how AI can enhance the analysis of extensive climate data and detection of important climate change trends, ultimately shaping public perception, policy decisions, and actions (2). Through qualitative content analysis using MAXQDA software, the study will examine how journalists perceive the role of AI in climate reporting, the contribution of AI technology to public awareness, potential future developments, and key recommendations for stakeholders to enhance the use of AI in climate reporting (4). By shedding light on these aspects, the study aims to provide valuable insights into how AI can be leveraged to improve climate change reporting and drive action in Southern Africa (3).

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**Name:** Izak
**Surname:** Potgieter
**Faculty:** Art, Architecture & Design
**Department:** Multimedia
**Registered degree:** PhD – Art & Design
**Supervisor(s):** Prof Anthony Ambala, Dr Pieter Hermanus Myburgh

**Embodying Sophiatown : Mediating Multivocal Representations of Cultural Heritages in Virtual Reality**

Izak Frederik Potgieter, Anthony Ambala, Pieter Hermanus Myburgh

Department of Multimedia: Bunting Road Campus, Auckland Park

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**Keywords:** Cultural Heritage, CH, Virtual Reality, VR, Extended Reality, XR, Intangible Cultural Heritage, CGT, Constructivist Grounded Theory

Virtual reality (VR) as a medium for representing cultural heritage (CH) seldomly uses ethnographic sources as data for the representation of CH in VR [1]. This has contributed to a geographic bias favouring the creation of CH in VR projects in the West, where CH sites tend to be protected and physically intact more often [2]. The preference for physical sources over non-physical data sources, such as ethnographic sources, also contribute to a bias towards the representation of tangible CH over intangible CH [3]. This results in CH in VR representations that focus on the visual appearance of objects and sites. This focus overlooks the practices, representations, expressions and knowledge inherent in the CH. This research uses constructivist grounded theory to analyse and extract valid data from ethnographic sources for the representation of CH in VR. Sophiatown in Johannesburg, South Africa is used as a case study to demonstrate the extraction and use of valid data from ethnographic sources, specifically interviews, for use in the representation of CH in VR. The physical CH site of Sophiatown has almost entirely been destroyed by the apartheid regime [4]. Therefore, any representation of it in VR cannot rely on physical sources alone and ethnographic sources become essential to its representation. In the prevailing paradigm, favouring the physical aspects of CH and objective sources, a site such as Sophiatown is essentially unrepresentable. By laying out a technique for the extraction of valid data from ethnographic sources, CH in VR representations may be constructed with more data potentially at their disposal. This may enable the representation of CH that have been difficult to represent from tangible sources alone, such CH is often found in the global south [2]. By practically demonstrating how valid data can be extracted from ethnographic sources, this research may also enable richer representations of CH in VR as ethnographic data and the intangible CH often inherent in ethnographic accounts may be considered and included into CH in VR representations using the framework laid out by this research. There is no CH that does not also have intangible aspects to it[5]. Ethnographic data can be a rich window into the intangible aspects of CH, their use in the representation of CH in VR may lead to richer and more multi-dimensional representations of CH.

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**Co-delivery of gold nanoparticles and berberine as a nanotheranostic agent for Computed Tomography image-guided Photodynamic therapy**

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**Keywords:** Citrate gold nanocomplex; nanotheranostics; lung cancer; berberine; computed tomography (CT); photodynamic therapy

Lung cancer is second most frequent cancer globally with 1.76 million death annually [1]. Also, lung cancer ranks seventh for women and third diseases for men, in South Africa and as the number one cause of cancer related deaths [2]. Treatment and diagnosis of cancer is still remains as big challenges in worldwide. So far the conventional modalities are radiotherapy, surgery and chemotherapy that causes high side effects in patients. Moreover, diagnosis of cancer in early stage could help to treat it successfully [3]. Furthermore, the problems with iodine-based compounds which the most widely used CT contrast agents are such as their short blood circulation duration, renal toxicity, and most importantly their inability to distinguish between healthy tissues and tumors can be resolved by using Gold nanoparticles (AuNPs) in CT imaging [4]. AuNPs has tremendous potential for usage as a computed tomography contrast agent and enhanced absorbance of X-ray and laser radiation [5]. Berberine is a photosensitizer with absorption peak between 344-421 nm wavelengths [6]. The aim of this project is to determine the therapeutic and diagnostic effects of liposome co-loaded citrate gold nanoparticles (citrate AuNPs) and berberine (BBR) (Lipo@AuNPs@BBR) nanocomplex on A549 lung cancer cells. This noncomplex has potent to diagnosis cancer in early stage and can be used as photosensitizaer in photodynamic therapy simultaneously. To evaluate the cytotoxic effects of citrate AuNPs and BBR and Lipo@AuNPs@BBR in A549 spheroid cells, some cellular and molecular techniques including MTT assay, LDH assay ATP assay, gene expression assay (real-time PCR) and protein assay (Western blotting) will performed. Additionally, to investigate contrast enhancement of citrate AuNPs and Lipo@AuNPs@BBR complex in computed tomography (CT) scan, clinical CT machine can be used to obtain the images (Siemens Somaton,Balance, Kv=80, mas=250, pich=1). Finally, photodynamic therapy (PDT) effects of citrate AuNPs and BBR and Lipo@AuNPs@BBR complexes using 405 nm at 15 J/cm$^2$ fluency on A549 cells were assessed. We hope this new Nano-complex helps physicians to diagnosis and treatment of cancerous patients in clinic, and open new window in clinical research.

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### An investigation of grade 9 learners' errors and misconceptions in their solving of algebraic equations

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South African learners' mathematics performance is poor across all topics, but especially in algebra [1]. There are several reasons for this, not least the extensive use of variables in the topic. Learners commit many different types of errors when solving algebraic equations, and the teacher's responsibility is to identify and address these errors [2]. This study reports on the findings of a master's study in which grade 9 learners from a Johannesburg high school were asked to answer an assessment task that contained different types of algebraic equations. The learners' responses were inductively analysed, and the errors they committed were categorised into groups. Some misconceptions were also inferred. The errors included (among others) learners' difficulties with addition and subtraction of like/unlike terms; challenges when dividing terms and when solving for $x$; incorrect application of the distributive rule (including operation error); poor conceptual understanding of the lowest common denominator (LCD) when simplifying fractions; errors when transposing terms; equals sign error; and misapplication of exponential laws. Two mathematics teachers were interviewed, and their knowledge of learner errors when working with algebraic equations was elicited. The researcher sought to find a relationship between the learners' errors and the teachers' declarative mathematical knowledge for teaching.

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## Synthesis, Characterization, and Applications of Transition Metal-Doped Chromite Nanoparticles

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Nanotechnology can be defined as the science and engineering involved in the design, synthesis, characterization, and application of materials and devices. Nanotechnology plays a major role in the applications of biological labels in fluorescent materials, drug-gene delivery, tissue engineering, detection of pathogens, proteins, and tumours, separation, purification of biological molecules and cells, MRI contrast enhancement, and phagokinetic studies [1-2]. Chromium (Cr) is a metal that belongs to the transition metal group and is an essential trace element for human beings because it helps us to use it in glucose [3]. In the present work, Cr-doped nanoparticles (NPs) were synthesized using sol-gel [4] and green synthesis methods [5] and calcined at different temperatures of 500 and 800 °C. In the green synthesis method, the ethanol plant extract from Krantz aloe (*Aloe arborescence)* was used. The synthesized nanoparticles were characterized using the x-ray diffraction method, Transmission Electron Microscopy technique, Scanning Electron Microscopy, Fourier Transform Infrared Spectroscopy, and Vibrating Sample Magnetometer methods. The synthesized nanoparticles were evaluated for their anticancer potential in terms of cell viability against the normal (human embryonic kidney 293; HEK-293) and cancerous (colorectal adenocarcinoma cell; DLD-1) cells for the NPs obtained by green and chemical synthesis methods. The NPs obtained by the green synthesis method showed less toxicity against HEK-293 when compared to NPs obtained by the chemical synthesis method and the green synthesized NPs killed more cancerous (DLD-1) cells without affecting the normal cells.

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**Design and Development of A Blockchain-Powered Carbon Trading System**

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**Keywords:** Greenhouse gas, carbon emissions, emission trading system, blockchain technology

The increase in greenhouse gas emissions has induced intense climate change, significantly impacting human lives through increased mortality rates, flood-related death, and exacerbated effects like cognitive decline due to heightened nitrogen dioxide ($NO_2$) concentrations [1]. While effective in controlling emissions, the European Union Emission Trading System operates centrally, fostering vulnerabilities such as potential inaccuracies in emission record reporting and susceptibility to manipulation [2]. This project addresses these challenges by addressing the absence of an emission trading system across the African continent and the limitations of existing centralised systems [3]. The study aims to develop a blockchain-powered carbon trading system using Django (Python Rest Framework Library), Python, PostgreSQL, Hedera Blockchain, and Solana Pay. This innovative solution ensures transparency, immutability, and decentralisation in carbon trading. Automating the recording of carbon emissions mitigates human-induced errors associated with manual reporting prevalent in current systems. Compared to conventional methods, our system revolutionises the agreement process between application entities into smart contracts, eliminating third-party interference. Moreover, it offers an inherent advantage by automatically capturing carbon emission records, minimising inaccuracies and manipulation. The system's performance was evaluated and confirmed sufficient for the release of the first version. Implementing this blockchain-powered system can also represent a transformative step towards a more secure, transparent, and efficient carbon trading infrastructure, potentially paving the way for global adoption and impact.

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**Chatbot effectiveness in customer query resolution for a South African telecommunications service provider.**

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**Keywords: chatbots, customer service, queries, artificial intelligence (AI)**

Conversational chatbots have emerged as promising tools for enhancing customer service efficiency globally [1]. To fully leverage the potential of chatbots, organizations must ensure that their chatbot systems meet industry standards and fulfill customer service expectations. However, research suggests that chatbot quality often falls short of these standards [2,3]. Therefore, it is imperative for organizations to enhance their abilities in assessing and monitoring customer interactions with chatbots. This study delves into the performance of a conversational chatbot within the South African telecommunications industry, aiming to provide insights into the chatbot's ability to resolve customer queries accurately and efficiently. By adopting a multi-method qualitative approach, which includes document analysis, in-depth interviews, and platform evaluation, this research comprehensively examines the interaction dynamics between users and the chatbot. Thematic analysis and triangulation reveal key insights into the performance of the conversational chatbot across three perspectives: information retrieval, linguistic proficiency, and artificial intelligence capabilities [4]. The findings shed light on the strengths and weaknesses of the chatbot in swiftly addressing common queries, while also identifying specific areas for improvement, such as enhancing natural language understanding and contextual awareness. The study contributes to the broader understanding of human-chatbot interaction and provides actionable recommendations for optimizing chatbot functionality to enhance customer satisfaction and organizational efficiency within the unique context of South Africa.

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### Study of structural and magnetic properties of chromite-based core-shell nanomaterials.

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**Keywords: Data storage, core-shell, advanced material, exchange bias, and superparamagnetic behaviour.**

The usage of data storage is increasing dramatically all around the world. The materials used for data storage change rapidly because of the demand for storage. In order to solve the storage problem, advanced/multifunctional materials have attracted much attention in recent years because of their magnetic properties and potential for spintronic applications such as high-density recording media [1] and data storage devices [2]. Advanced materials show unique and/or enhanced properties relative to conventional materials that has enabled many technological innovations benefitting modern society. Many advanced materials exhibit multiferroicity and exchange bias mechanisms. Examples of advanced materials are cobalt chromite ($CoCr_2O_4$), copper oxide ($CuO$), terbium manganite (($TbMnO_3$), and bismuth ferrite ($BiFeO_3$). $CoCr_2O_4$, $CuO$, chromium oxide ($Cr_2O_3$), and nickel oxide $NiO$ were selected to be studied because of their magnetic properties [3-6]. This thesis focuses on the study of these type of advanced materials, by considering the physical and magnetic properties of nanoparticles, exploring possible exchange bias and superparamagnetic behaviour in core-shell systems. $CoCr_2O_4$ was used as the core and $CuO$, $Cr_2O_3$, and $NiO$ were used as the shell of the core-shell systems. In certain instances silicon dioxide ($SiO_2$) was used as a buffer between core-shell systems because $SiO_2$ is non-magnetic [7]. These $CoCr_2O_4/CuO$, $CoCr_2O_4/Cr_2O_3$, $CoCr_2O_4/NiO$, $CoCr_2O_4/SiO_2/CuO$, $CoCr_2O_4/SiO_2/Cr_2O_3$, and $CoCr_2O_4/SiO_2/NiO$ were prepared and characterized using various techniques. The crystal structure and purity of the samples were determined using the powder x-ray diffraction (XRD) technique. The expected crystal structures of the sample were confirmed by the XRD results. The morphology and structure were determined using the transmission electron microscope. It confirmed the formation of nanocomposite for $CoCr_2O_4/CuO$, $CoCr_2O_4/Cr_2O_3$, and $CoCr_2O_4/NiO$ samples. Core-shells were observed on $CoCr_2O_4/SiO_2/CuO$, $CoCr_2O_4/SiO_2/Cr_2O_3$, and $CoCr_2O_4/SiO_2/NiO$ samples. The magnetic properties were studied using a vibrating sample. Exchange bias were observed in all samples, while superparamagnetic behaviour were observed in the $CoCr_2O_4/CuO$, $CoCr_2O_4/Cr_2O_3$, and $CoCr_2O_4/NiO$ samples. Optical properties were studied using Fourier infrared and ultraviolet-visible near-infrared spectroscopy. Preliminary results indicate that these materials have the potential to be used in photovoltaic and spintronic applications.

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## The Perception of Load Shedding's Impact on Academic Performance among Students at the University of Johannesburg

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**Keywords:** Load shedding, power outages, electricity, perceptions, students

Since the covid-19 pandemic in 2019, institutions of higher education in South Africa resorted to introduce online teaching and learning as a method of ensuring that the academic calendar is not affected (2). Globally, online teaching and learning have been commended as the pinnacle of open distance learning. However, in South Africa, this approach has been disrupted by continuous power cuts (2). When electric utilities encounter generation insufficiencies, lack of adequate transmission and distribution capabilities or faults, they implement an integral approach termed load shedding so that they maintain power system stability (1). Load shedding disrupts access to educational technologies, classroom activities, and study plans. This study investigates the perceptions of students at the University of Johannesburg regarding the impact of load shedding on their academic performance and explores the resilience strategies they employ to mitigate its effects. The motivation for investigating the students' perceptions on load shedding is that in recent years, the electricity demand in South Africa has been growing mainly due to advancements in technology and industries' growth (1), as such from 2018 the country has been facing immense challenges concerning load shedding and power outages. Focusing on the Faculty of Education, the research employs a mixed-methods approach, combining surveys, interviews, and focus group discussions to gather comprehensive data. The findings will provide valuable insights for crafting effective interventions and policies to support students in sustaining their educational advancement despite recurrent interruptions.

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**Navigating Global Conservation: The Impact of CITES on Wildlife Trade**

**A Glimpse into Wildlife Trade Regulation**

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This study critically analyzes the international political economy of transnational endangered wildlife conservation regimes, focusing particularly on Zimbabwe's role within the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). It explores the various motives, interests, power relations, and incentives that shape CITES's structure and assesses the implications of this structure for the regime's effectiveness. Zimbabwe, as a prominent elephant range state in Africa, provides a poignant case study for examining the efficacy and broader impacts of CITES, especially given its significant challenges related to the illegal ivory trade [1][2]. The analysis reveals that although CITES is designed to regulate international trade of endangered species to ensure their survival, its effectiveness is compromised by enforcement difficulties and complex geopolitical dynamics [3][4]. Instances of prohibition measures, intended to curb poaching and illegal trade, have sometimes inadvertently driven the trade underground, benefiting only intermediaries and failing to reduce poaching effectively [5][6]. The study underscores the necessity for a re-evaluation of CITES's role and effectiveness in contemporary conservation efforts, advocating for an adaptive approach that is responsive to the specific conditions and needs of member states like Zimbabwe to facilitate real progress in wildlife conservation [7][8].

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**Title: Safer Foods and Zero Hunger: Reduction of Postharvest Losses through the Development of Active Food Packaging from Indigenous Plant Essential Oils**

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**Keywords:** Biological activities, Edible coatings, Essential oils, Indigenous plants, Postharvest studies

In 2023, there was a 28% year-on-year increase in the number of undernourished people in the world from 572 to 735 million [1], yet the annual global food losses stood at 1.6 billion tons [2]. Similarly, several side effects have been attributed to the use of synthetic food preservatives [3], while food waste also contributes significantly to air and environmental pollution as well as global warming [4]. Hence, the primary means of addressing the hunger crisis and reducing environmental pollution is to reduce food loss. Essential oils from South African indigenous plants have remarkable biological activities that may be employed in postharvest preservation [5]. However, issues of volatility, heat sensitivity, and quick release limit their uses and applications [6]. This study will use encapsulation technology to stabilize the EOs and preserve their efficacy before assessing their effectiveness in maintaining the postharvest quality of selected fruits. To achieve the aim of the research, selected (12) indigenous plant EOs will be assessed for properties that are essential for any biomolecule to be used in postharvest preservation, including phytochemical, antifungal, antioxidant, anti-inflammatory, and toxicological activities following established protocols. Candidates with high activity and low toxicity will be selected for encapsulation. The powders formed after encapsulation will be assessed for their biological activities to determine the effects of the encapsulation on the activities of the EOs. The powders will then be incorporated into edible coatings. The coatings will be applied to selected fruits, and an assessment of the efficacy of the treatment will be carried out by comparing the physicochemical characteristics of the treated and untreated fruits stored under similar conditions. In cases where positive results are achieved, the mechanism of action will be investigated using the OMICs approach.

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# Assessment Rubric

Participants name: _____

| Research Understanding | Criterion | Score |
|---|---|---|
| Video provides a clear and comprehensive understanding of the research question, leaving no ambiguity. | 5 | |
| Video provides a good understanding of the research question, with minor areas that could be clarified. | 4 | |
| Video provides a basic understanding of the research question, but some aspects remain unclear. | 3 | |
| Video touches on the research question but lacks depth and clarity. | 2 | |
| Video fails to convey a clear understanding of the research question. | 1 | |

| Communication and Language | Criterion | Score |
|---|---|---|
| Research is communicated in clear, concise language easily understood by a non-specialist audience, with appropriate terminology explained. | 5 | |
| Research is communicated in mostly clear language with minor jargon that could be simplified for a non-specialist audience. | 4 | |
| Research is communicated with some use of technical language that may not be accessible to a non-specialist audience. | 3 | |
| Research is communicated using overly technical language that is difficult for a non-specialist audience to understand. | 2 | |
| Research is communicated in a way that is incomprehensible to a non-specialist audience. | 1 | |

| Engagement and Creativity | Criterion | Score |
|---|---|---|
| Video is highly engaging, visually striking, and memorable, using creative elements effectively to capture and maintain the viewer's attention. | 5 | |
| Video is engaging and visually appealing, using creative elements to enhance the presentation. | 4 | |
| Video is visually adequate but lacks strong creative elements or engagement. | 3 | |
| Video is visually uninspired and lacks engagement. | 2 | |
| Video is visually unappealing and fails to engage the viewer. | 1 | |

| Technical Quality | Criterion | Score |
|---|---|---|
| Video is well-produced with high-quality visuals and audio, smooth transitions, and clear, legible text. | 5 | |
| Video is well-produced with good visual and audio quality, smooth transitions, and clear text. | 4 | |
| Video has adequate visual and audio quality but may have some minor technical issues. | 3 | |
| Video has some technical issues that detract from the overall quality. | 2 | |
| Video has significant technical issues that make it difficult to watch or understand. | 1 | |

| Topical Significance | Criterion | Score |
|---|---|---|
| Video leaves a lasting impression, inspiring the viewer to learn more about the research and its potential impact. | 5 | |
| Video effectively communicates the research and its significance, leaving a positive impression on the viewer. | 4 | |
| Video communicates the research but does not fully convey its significance or potential impact. | 3 | |
| Video has limited impact and fails to inspire the viewer to learn more. | 2 | |
| Video fails to leave a positive impression or inspire further interest in the research. | 1 | |

| **Questions and Answers** | Criterion | Score |
|---|---|---|
| Participant demonstrates a deep understanding of their research and can answer questions clearly and concisely in a way that is accessible to a non-specialist audience. | 5 | |
| Participant demonstrates a good understanding of their research and can answer most questions clearly and concisely. | 4 | |
| Participant demonstrates a basic understanding of their research but may struggle to answer some questions clearly or concisely. | 3 | |
| Participant has limited understanding of their research and struggles to answer questions clearly or concisely. | 2 | |
| Participant demonstrates a lack of understanding of their research and is unable to answer questions effectively. | 1 | |

| **TOTAL SCORE (Out of 30)** | |
|---|---|
| | |

**COMMENTS**

This very brief comment will be used to provide feedback to entrants. Please identify one positive and one area for improvement (the most obvious area).

# Organizing Committee
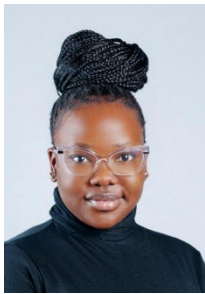## Research Capacity Development Unit

Prof Penny Govender

Ms Megan Engelbrecht

Dr Shandré Pillay

Ms Relebohile Moso

Mr Nkosiyethu Ntuli

Ms Koketso Pila

Mr Lawrence Asani

# Acknowledgements

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**Postgraduate School**
https://www.uj.ac.za/postgraduate

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**Email:** info@platesndplatters.net
**Web:** https://www.platesandplatters.net/contact-plates-and-platters

# Gallery

# Winners

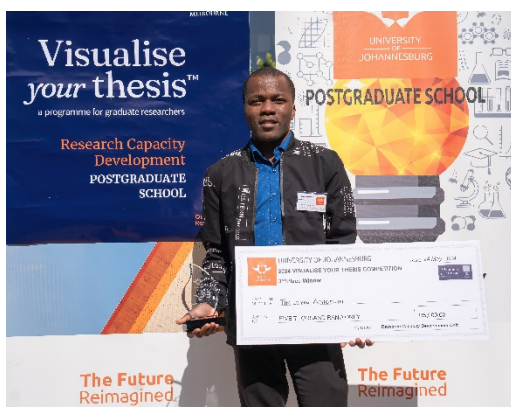### First Place

[Izak Potgieter](#)
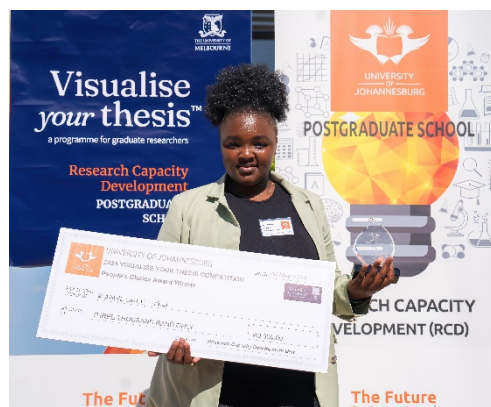


### Second Place

[Isac Mabunda](#)



### Third Place

[Timileyin Abiodun](#)



### People's Choice Award

[Kamvelihle Bili](#)



*Please click on the winners name to take you directly to their abstract.

* To view the winners video submissions, please visit our website: [Click here](#).

Thank you for making the 2024
Local VYT Competition a success.

We look forward to seeing you at
the next one!

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