



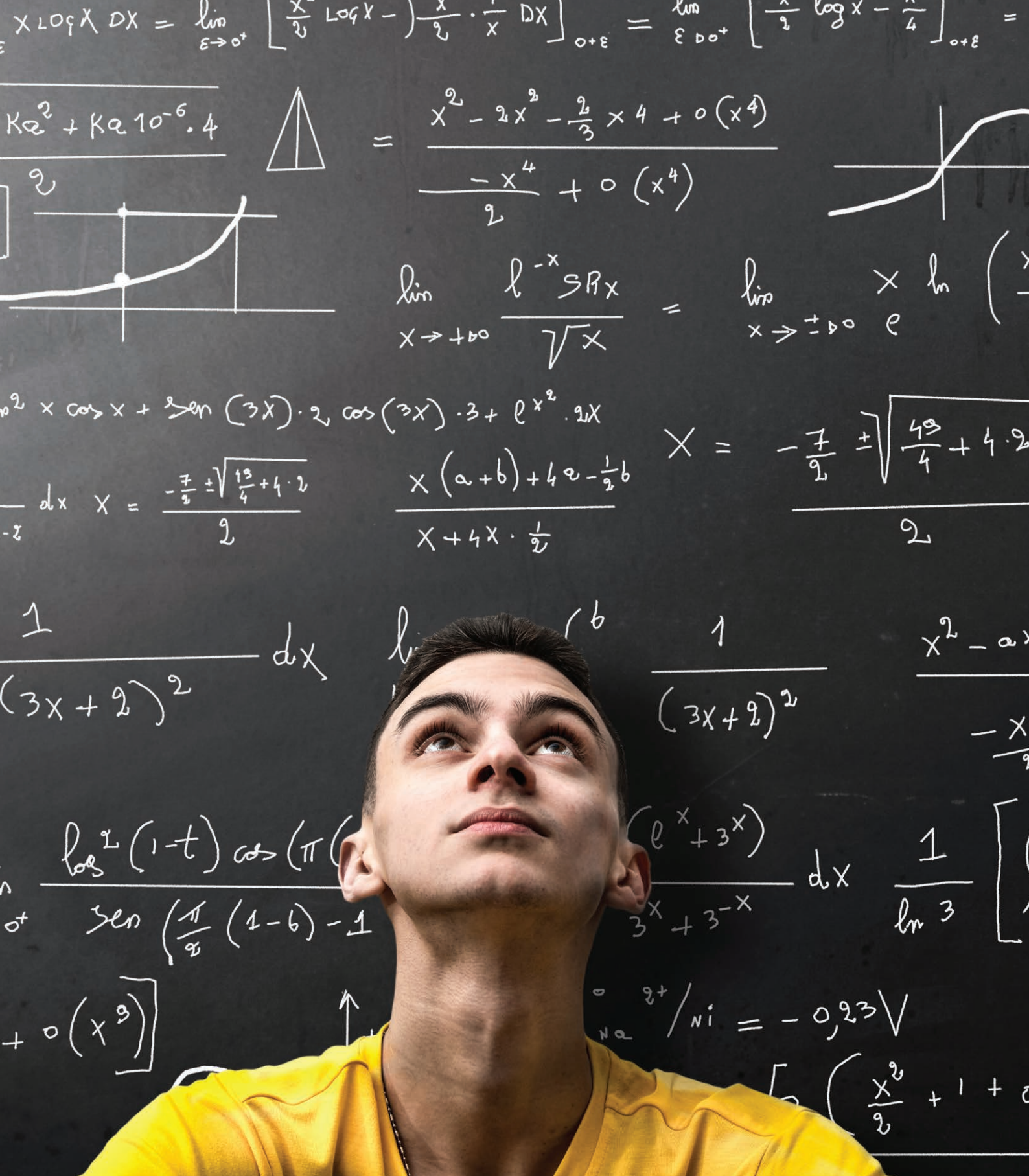
**VAAAL UNIVERSITY
OF TECHNOLOGY**

Inspiring thought. Shaping talent.

RESEARCH REPORT

2020





$$\int x \log x \, dx = \lim_{\varepsilon \rightarrow 0^+} \left[\frac{x^2}{2} \log x - \left(\frac{x^2}{2} \cdot \frac{1}{x} \right) dx \right]_{0+\varepsilon} = \lim_{\varepsilon \rightarrow 0^+} \left[\frac{x^2}{2} \log x - \frac{x}{2} \right]_{0+\varepsilon} =$$
$$\frac{K a^2 + K a 10^{-6} \cdot 4}{2} \quad \triangle$$
$$= \frac{x^2 - 2x^2 - \frac{2}{3} \times 4 + o(x^4)}{\frac{-x^4}{2} + o(x^4)}$$
$$\lim_{x \rightarrow +\infty} \frac{e^{-x} \sin x}{\sqrt{x}} = \lim_{x \rightarrow +\infty} \frac{x \ln \left(\frac{1}{e} \right)}{e}$$
$$2 \times \cos x + \sin(3x) \cdot 2 \cos(3x) \cdot 3 + e^{x^2} \cdot 2x$$
$$x = \frac{-\frac{7}{2} \pm \sqrt{\frac{49}{4} + 4 \cdot 2}}{2}$$
$$\frac{x(a+b) + 4a - \frac{1}{2}b}{x + 4x \cdot \frac{1}{2}}$$
$$X = \frac{-\frac{7}{2} \pm \sqrt{\frac{49}{4} + 4 \cdot 2}}{2}$$
$$\frac{1}{(3x+2)^2} dx \quad \int \frac{1}{(3x+2)^2} dx$$
$$\frac{1}{(3x+2)^2} dx \quad \frac{1}{(3x+2)^2}$$
$$\frac{\log^2(1-t) \cos(\pi(1-t))}{\sin\left(\frac{\pi}{2}(1-t) - 1\right)}$$
$$\frac{1}{\ln 3} \left[\frac{e^x + 3^x}{3^x + 3^{-x}} \right] dx$$
$$+ o(x^3) \quad \uparrow$$
$$\frac{1}{ni} = -0,23V$$
$$\int \left(\frac{x^2}{2} + 1 + \dots \right)$$

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MESSAGE FROM THE ACTING DEPUTY VICE-CHANCELLOR:

RESEARCH, INNOVATION, COMMERCIALISATION AND INTERNATIONALISATION

In the year 2020, the Vaal University of Technology monitored the global Covid-19 outbreak in real-time. The combined proficiency and committed efforts of all Vaal University of Technology community members to prevent, contain, prepare for, respond to, and recover the potential effects of this emerging infectious pandemic.

Our goals are:

- Maintain and strengthen our general formative degree offering and the research nexus which enables our students to access powerful knowledge;
- Enable access to postgraduate students and provide them with conditions that allow them to flourish as critical and engaged citizens;
- Maintain and strengthen our unique institutional niche/centres as a Research University;
- Ensure financial and environmental sustainability practices through good governance, leadership and management;
- Attract, nurture and retain staff of high-calibre and maintain an inclusive, welcoming, affirming and positive intellectual environment; and
- Provide relevant and appropriate academic infrastructure, equipment and facilities to support our academic project.

It is upon all of us to re-imagine our University as one in which sustainability permeates every aspect of our academic endeavour, including an elevated sense of awareness and responsibility of our graduates for building sustainable communities. It calls upon us to ensure that we are simultaneously locally responsive and globally engaged. It calls upon us to advance social justice and do all we can to restore dignity and humanity.

We move from where Research is usually understood to have a research question problem for which a solution must be sought to innovation. Research must now convert the answer to the situation into a possible prototype that can be commercialised. The Research cycle reflects the integration of Research, Research development, Technology transfer, Innovation and Commercialisation.

In June 2019, the Senate of the Vaal University of Technology approved the Research Ethics Policy, the Terms of Reference of the committees, and the Standard Operating Procedures for

Research Ethics at the University. In 2020 we formally established and operationalised the Central Research Ethics Committee (CREC) for the Faculties of Human Sciences, Management Sciences, Applied and Computer Sciences, and Engineering.

Applications from within and outside the University for both degree and non-degree research projects were processed. The interface between Research Ethics processes and the control over Intellectual Property (in line with the entrepreneurial ethos of the University) were established. Research Ethics govern the standards of conduct for researchers. It is essential to adhere to ethical principles to protect the dignity, rights and welfare of research participants.

The year 2020 means there is a lot of inspiration out there for researchers, and it can be applied in a broad range of ways. It is important to remember that Research does not exist in a vacuum. It is surrounded by business operations, drawing on ideas that improve insight, process, communications and more. However, it can be easy to forget this – to fall into ‘research blinkers’ that narrow our field of view.

PROF C.M. VAN DER BANK



MESSAGE FROM THE: DIRECTOR OF RESEARCH

The Vaal University of Technology has its core missions of teaching, research, and community engagement. These missions were greatly impacted on by the COVID- 19 and its associated effects including national lockdown for most part of the year 2020. However, whilst classroom contact sessions for teaching was greatly stopped for the year 2020, research continued within that period.

The Directorate of Research used the period of national lockdown to evaluate and build upon the research structures of the university. The main goal of these research evaluation activities was improved on research outputs, outcomes and ensure research accountability at all levels of the university.

The Directorate revised and developed eight (8) research related policies which were in their final stages to be submitted to MANCOM. These include Research Funding Policy, Grants and Contracts Policy, Adjunct Appointee and Visiting Scholar Policy, Postdoc Policy, IP Policy, Commercialization Policy, Research Professors Policy and Research Data Management Policy.

The Directorate further worked on improving data aggregation of all activities undertaken by the directorate so to improve on reporting and decision making on research at the university. The University capacity Development Grant is a core source of funding for research capacity development at VUT. In 2020, the directorate developed customized programme and its related activities with an overarching goal if helping 22 staff members acquire doctoral degrees by the end of 2023.

On core research activities, research publications increased in 2020. There was an increase from 128 journal article units in 2019 to 211 units in 2020. Conference units was 5.833. It is noteworthy that there was a further significant decrease in the Conference Proceedings submissions due to the travel restrictions imposed by the Covid-19 pandemic. The university's target set for Publication units per permanent instructional/ research staff in 2020 was 0.30. That target was exceeded by 0.02 will the actual been 0.32. The increase in the target can be attributed to that fact that Research/Academic staff had the needed time to work through the data and publish since teaching workload was reduced due to COVID -19 lockdown.

On Research output units, the university achieved 124.217 units exceeding the target of 124 units set for the year under review. The target set for the Number of staff contributing to research publication outputs – 260 was not met. Only 116 staff

contributed to the number of publications. The reason for the negative variance amongst others included the academic year was disrupted by Lockdown leading to disruption of field work and reduced laboratory activities.

On Postgraduate Studies, the number of masters students enrolled in the year 2020 was 507, which exceeded the expected target of 347. Doctoral enrolment was at 127, exceeding the 2020 target of 101 across all faculties. There was a steady increase in the number of M and D graduates for 2020 with 48 Masters graduates (2020 target of 35) and 18 (2020 target of 7) doctoral graduates.

One important task the Directorate undertook was Review of existing Research Entities. The review was successful carried out and based on the outcome, a newly developed framework for the operationalization of the research entities was also approved by MANCOM in December 2020.

On research A total of R18 234 147,44 was received from external sources, which was over R10 million less than the target for 2020. One new rating (Y2 rating) was approved in 2020, and there was a rating re-evaluation from a Y2 to a C3 rating. At the end of 2020 we had 7 NRF rated researchers at VUT.

The Central Research Ethics Committee of the University was duly constituted in 2020. The CREC approved 24 research projects, whereas the FREC has approved 87, these applications were from all faculties at VUT

COVID-19 had some impact on lab work but overall, it was good year for researchers to publish their research which have been on hold due to other engagements. We look forward to improving on research outputs and partnerships with key stakeholders in 2021.

DR S.M. NELANA



A woman with blonde hair is wearing a VR headset and interacting with a virtual environment using hand gestures. She is in a cafe-like setting with coffee cups on a table in the foreground. The background is blurred, showing other people and interior lights.

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Research is usually understood
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A LOT OF INSPIRATION
OUT THERE





TECHNOLOGY TRANSFER & INNOVATION

MESSAGE FROM THE EXECUTIVE DIRECTOR

DR J. MOLETE



The Technology Transfer & Innovation, as part of the Vaal University of Technology Research community, has continued to generate new knowledge and innovations, all challenged in these uncertain times and responding to the challenges presented by the Covid-19 pandemic.

Reflecting on the past year and the challenges of the past few months, one can only portray an incredible admiration for the ingenuity, brilliance and drive of the community of Innovators from Technology Transfer & Innovation. These Innovators adapted to unprecedented changes in their Research and rose to the challenge by creating many innovations to address the Covid-19 pandemic. This pandemic has heightened the role that great Universities of Technology play in understanding and responding to the biggest challenges facing our world.

Besides the bad news that 2020 brought upon our world, it was time to take stock of what we have done in the past. We decided how to amend operational models to keep up with the new demands of the Covid-19 pandemic, reaching South Africa.

One of the Professors in our circle remarked that “it is time to toss the bread in the water and work with what came back”. The Technology Transfer & Innovation established a Teams Working Group late in March 2020 to establish what role we, with the advanced manufacturing precinct, can play to assist society and the Vaal University of Technology in overcoming the problem of affordable access to Personal Protective Equipment (PPE).

In this process, we identified the first Research Project to reverse engineer a “world war II” mechanical ventilator since all statistics indicated a national shortage. In the process, the Vaal University of Technology Engineers produced a PA 12 sintered manifold. It proved that the sintered module could replace aluminium with proper O-ring sealing adequately on the polyamide surface. We submitted an NPV 1 proposal to develop a continuous Positive Airway Pressure based on a Triparty Collaboration Agreement.

The Triparty was unsuccessful, but fortunately, merSETA called a Bilevel Positive Airway Pressure (BPAP) device, and a new consortium with UJ, VUT, CUT, TUT and NWU was created and successfully appointed by merSETA. The consortium of Universities wants to use this exercise to determine the feasible opportunities in the ventilator market to solicit an industrial partner to participate in the industrialisation of a unique consortium designed and developed BPAP device.

The Technology Transfer & Innovation, as part of the Vaal University of Technology Research community, has continued to generate new knowledge and innovations, all challenged in these uncertain times and responding to the challenges presented by the Covid-19 pandemic.

The Technology Transfer & Innovation Inventors are recognised for continuing to push the boundaries of knowledge. I hope the Technology Transfer & Innovation’s effort of discovery and innovation impact inspire a generation of new Researchers at the Vaal University of Technology.

The resiliency of Transfer Technology & Innovation’s research support initiative is one of the unit’s greatest strengths. With this sense of persistence and confidence, the Technology Transfer & Innovation Management is gratified to share the Annual Research Report. The Technology Transfer & Innovation team is honoured to support the Vaal University of Technology community of Innovators in their work to ensure that the results of their Research and scholarly activities positively impact society.

The Technology Transfer & Innovation reported four prototypes completed, delivered to satisfied clients, and four new start-up companies launched.

DR J. MOLETE



Postgraduate Staff Qualifications Completed in 2020

Name: Mauchline, D.A.

Qualification: MEng

Dissertation Thesis Title: Evaluation of EOS PA2221 as a possible replacement for PA2200 in a South African context

University/Institution: Northwest University
Conferences

Papers and posters presented

Presenter and co-presenters: du Rand, F., van Tonder, P.J.M. & van der Merwe, A.F.

Title of Paper: Application of machine learning models for powder bed defect analysis

Conference: RAPDASA 2020

Place: Stellenbosch

Date: 04-06 November 2020

ISBN/ISSN: 978-0-620-90354-7

Presenter and co-presenters: Motlhabane, A.T., Matjila, M.A., Thaba, T.P., Nyembwe, K. & van Tonder, P.J.M.

Title of Paper: A review of possible sand reclamation methods for additive manufacturing processes

Conference: RAPDASA 2020

Place: Stellenbosch

Date: 04-06 November 2020

ISBN/ISSN: 978-0-620-90354-7

Presenter: van der Merwe, H.L.

Title of Paper: A view on the manufacturing future integrated with concepts like blockchain, 3D printing and the internet of things

Conference: RAPDASA 2020

Place: Stellenbosch

Date: 04-06 November 2020

Seminars/Workshops Presented

Title: 4IR summit – 3D printing technology within 4IR

Presented to: Department of Communications and Digital Technologies, NEMISA

Place: Birchwood Hotel, Boksburg

Date: 10-12 March 2020

Title: Intro to 3D CAD and 3D printing

Presented to: E-Skills Students

Place: VUT Science Park, Fablab

Date: 10-14 February 2020, 24-28 February 2020, 02-06 March 2020

Title: I2P workshop presentation on 3D CAD and 3D printing in future classrooms

Presented to: Department of Education, Educators and School Learners

Place: Mohloli Maritime Secondary School of Specialisation

Date: 07 February 2020

Title: merSEAT virovent reverse engineering and product development workshops

Presented to: merSETA Consortium

Place: Online, Teams

Date: 29 October 2020, 3 November 2020, 12 November 2020



Publications (Books/Chapters in Books)

Author and co-authors: Havenga, S.P., de Beer, D.J., Campbell, R.I., & van Tonder, P.J.M.

Chapter: Can digital fabrication education affect the South African science, technology and innovation objectives through curriculum infiltration?

Title: Industry 4.0 – Shaping the Future of The Digital World

Publisher: Taylor & Francis CRC Press/Balkema

Date: 2020

Page numbers of chapter:269-274

ISBN: 978-0-367-42272-1

Publications (Journals)

Author and co-authors: van Tonder, P.J.M., de Beer, D.J., & Wichers, J.H.

Title: A quality assurance framework for sulphonic acid-coated sand used in 3d printing applications

Journal: South African Journal of Industrial Engineering

Volume: Vol 31, N03;

Issue: 3

Page numbers of article:218-229

ISSN: ISSN 2224-7890 (on-line)

Research in Progress

Researcher: la Grange, J.J.

Title: Development of a quality assurance framework for 3 dimensional printed moulds

Field: Industrial Engineering

Researcher: Tshabalala, N.

Title: Casting defects due to chromite sand: evaluation of South African chromite sand

Field: Metallurgical Engineering

Researcher: Msani, Ms A.

Title: An investigation of financial models for rapid sand casting

Field: Metallurgical Engineering

Researcher: Chauke, Ms J.

Title: Evaluation of local chromite sands for rapid sand casting applications

Field: Metallurgical Engineering

Researcher: du Rand, F.

Title: Development of a quality management framework for powder-based additive manufacturing systems

Field: Industrial Engineering

Researcher: Mwai, P.

Title: Novel technique of platinum catalyst deposition for polymer electrolyte membrane fuel cells

Field: Electrical Engineering

Researcher: van der Merwe, H.L.

Title: Block chain technology to protect intellectual property in additive manufacturing

Field: Industrial Engineering

Research Partnerships/Collaboration

Researchers: du Rand, F. van der Merwe, A. & van Tonder, P.J.M.

Title of research: Development of a quality management framework for powder-based additive manufacturing systems

Higher Education Institutions: Stellenbosch University/Vaal University of Technology

Industry: Additive Manufacturing

Researchers: van der Merwe, H.L. & van der Merwe, A.F.

Title of research: Block chain technology to protect intellectual property in additive manufacturing

Higher Education Institutions: Stellenbosch University/Vaal University of Technology

Industry: Additive Manufacturing

Researchers: Tshabalala, N., Nyembwe, K. & van Tonder, P.J.M.

Title of research: Casting defects due to chromite sand: evaluation of South African chromite sand

Higher Education Institutions: University of Johannesburg/Vaal University of Technology

Industry: Additive Manufacturing

Researchers: Msani, A. Nyembwe, K. & van Tonder, P.J.M.

Researchers: Msani, A. Nyembwe, K. & van Tonder, P.J.M.

Title of research: An investigation of financial models for rapid sand casting.

Higher Education Institutions: University of Johannesburg/Vaal University of Technology

Industry: Additive Manufacturing

Researchers: Chauke, J. Nyembwe, K. & van Tonder, P.J.M.

Title of research: Evaluation of local chromite sands for rapid sand casting applications

Higher Education Institutions: University of Johannesburg/Vaal University of Technology

Industry: Additive Manufacturing

Research Partnerships with International Universities/ Collaboration

Researchers: Campbell, R.I. & Havenga, S.P.

Title of research: Directional composites through manufacturing innovation (DiCoMI)

Higher Education Institution: Loughborough University, The Technical University of Cluj- Napoca, Lund University, FH Aachen, National Aerospace University Sabanci University & Vaal University of Technology

Research institutes: Central Metallurgical Research and Development Institute, Scion

Artefacts

Artefact Name: Shredder

Description: A small scale prototype shredder used to shred data devices.

Target Group: E-waste/Electronic security

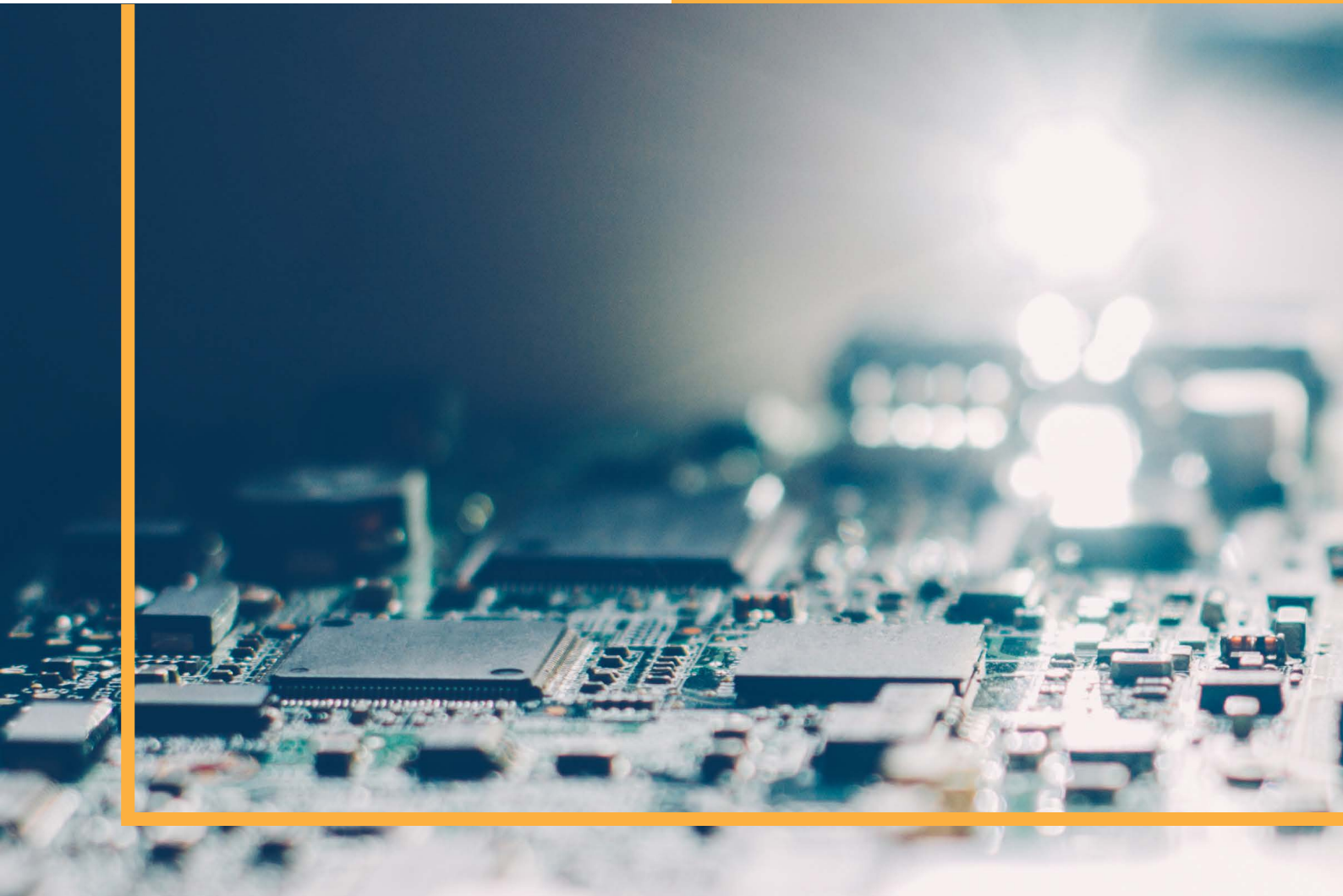
Peer reviewed: Yes

Artefact Name: Electrical tonneau cover

Description: The electrical powered tonneau cover is aimed at the automotive industry as an aftermarket accessory for bakkies (pick-ups). The cover can be remotely activated to close or open.

Target Group: Automotive

Peer reviewed: Yes



Artefact Name: Car distance waning Light

Description: A warning led display attached to the rear window alerts rear vehicles that they should keep a safe following distance.

Target Group: Automotive

Peer reviewed: Yes

Artefact Name: Multifunctional side handle baton

Description: The multifunctional side handle baton is a piece of self-defence equipment used by law enforcement officers. It has four tools integrated into one, a baton stick, cable tie capsule, a torch and pepper spray.

Target Group: Security

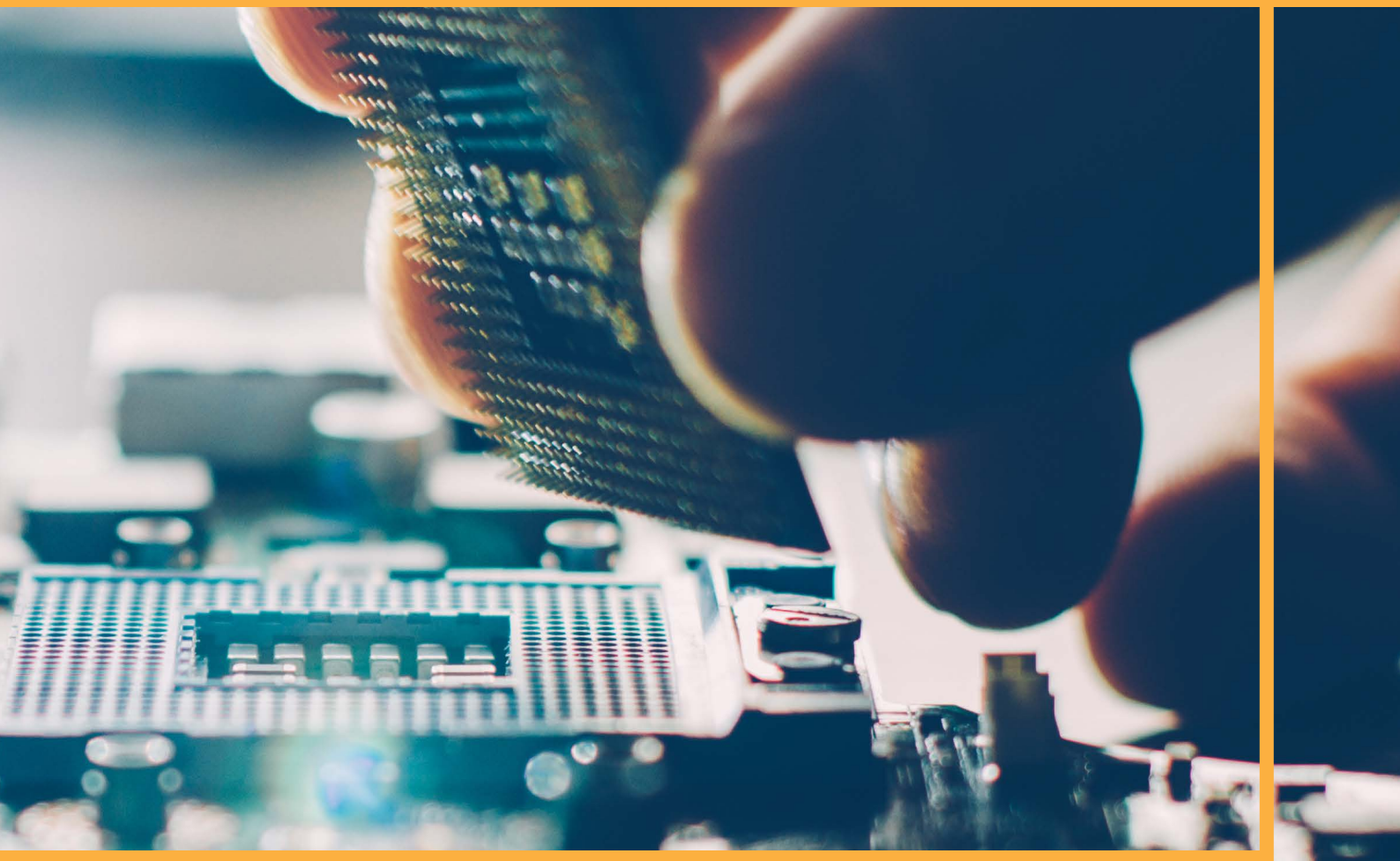
Peer reviewed: Yes

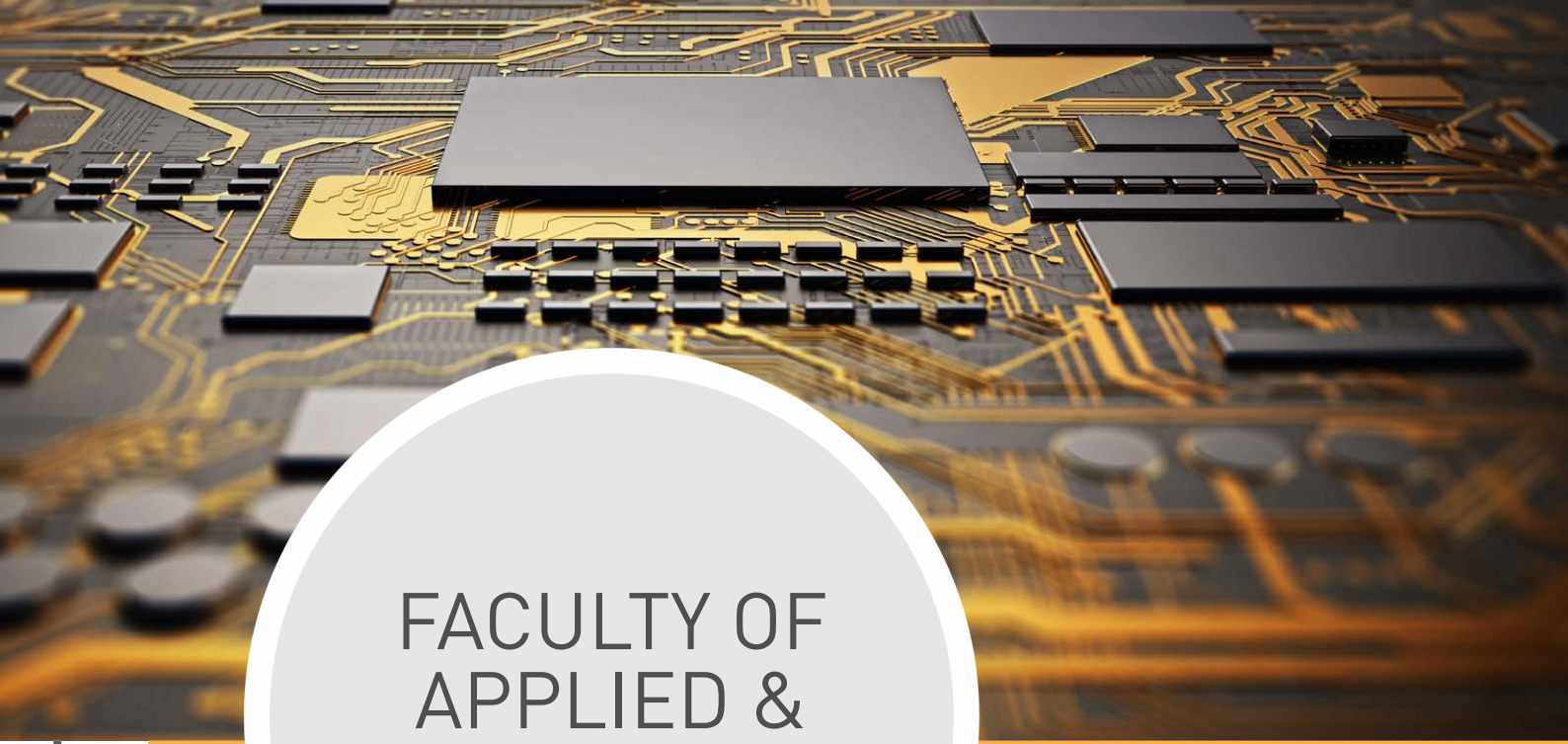
Artefact Name: Custom art piece

Description: Manufacturing of a small-scale art piece, for a Saudi Arabian sheikh.

Target Group: Art

Peer reviewed: Yes





FACULTY OF APPLIED & COMPUTER SCIENCES

MESSAGE FROM THE EXECUTIVE DIRECTOR

PROF B.R. MABUZA



Believing that there is great power in working together with others, our Researchers have forged exceptional partnerships with industry, national and international researchers in the same field of Research.

What a year 2020 was. It brought unexpected surprises and changes to the Faculty of Applied and Computer Sciences. This was due to the Covid-19 pandemic, which came upon the whole world uninvited. It immensely affected how we communicated with our postgraduate students. One can only imagine the anxiety, confusion, and frustration experienced by postgraduate students and Research staff.

Building on the traditional strengths of our researchers, postgraduate students, and postdoctoral fellows, the Faculty has grown from strength to strength. The Faculty Research is comprehensive and is based on the following research focus areas: (1) Science Education, (2) Water and Remediation, (3) Medical, Health and Wellbeing and (4) Information Systems and Smart Technology Applications.

The main objective of the Faculty Research is to make discoveries that fuel job creation, protect the environment and improve the quality of life. The Faculty has made notable advances across all its research focus areas.

Although postgraduate students had to step away from their work in the laboratories and much of the work had to move off-site, Research continued in the Faculty amid a global pandemic.

As I say every year, our researchers, talented postgraduate students, and postdoctoral fellows achieve so much without adequate funding. Several research papers were published, and a few masters and doctoral degree students graduated.

The Faculty Research provides the insights and innovations necessary to promote and sustain the environment, society, health, and the wellbeing of humans.

Believing that there is great power in working together with others, our Researchers have forged exceptional partnerships with industry, national and international researchers in the same field of Research.

The Faculty is committed to the Research that matters, which focuses on knowledge in action. Our Research has relevance beyond the confines of our Faculty. It is infused into our teaching and creates experiential and educational opportunities that enrich the students' experience. Our masters and doctoral degree graduates are more competitive in the job market because they have acquired transferable skills.

Thank you for working around the clock, day, and night, without rest or relief, to all our researchers, students, and postdocs. You had to adjust your work schedules and find new ways of conducting your Research. I have seen your efforts, and I appreciate all your contributions and your extraordinary service.

PROF B.R. MABUZA



Personal Particulars (Faculty Representative)

Faculty: Faculty of Applied and Computer Sciences

Department: Faculty Research Professor

Title: Prof

Initials: S.J.

Surname: Modise

Postgraduate Staff Qualifications Completed in 2020

Short term contract staff:

Name: Chihomvu, P.

Qualification: PhD Biotech

Thesis Title: The effect of solar irradiated salmonella typhimurium and campylobacter jejuni on the proliferation and activation of macrophages in vitro

University/Institution: Vaal University of Technology

Name: Madike, L.

Qualification: PhD Biotech

Thesis Title: The effect of crude water extracts of tulbaghia violacea Harv. On scaffolds with cardiovascular applications.

University/Institution: Vaal University of Technology



Conferences (Papers and posters presented)

Presenter and co-presenters: Xaba, T., Mitema, A. & Feto, N.A.

Title of Paper: Microbial detoxification of aflatoxins in food and feeds: advances in molecular and bio-analytical approach

Conference: XI International Scientific Agriculture Symposium "AGROSYM 2020" virtual conference

Place: Bosnia and Herzegovina

Date: 8-9 October 2020

ISBN/ISSN: n.a.

Presenter: Pillay, M.

Title of Paper: Conserving the diversity of crop plants

Conference: International Conference on Emerging Trends in Biotechnology (ICETB)

Place: Vellore, Tamil Nadu, India

Date: 14-16 December 2020

ISBN/ISSN: not published

Presenter and co-presenters: Chalwe, J.M., Mukherjee, U., Grobler, C.J., Mbambara, S. & Oldewage-Theron, Prof W.H.

Title of Paper: Association between hypertension, obesity and dietary intake in postmenopausal women from rural Zambian communities

Conference: National Health Research Authority, Quarterly Research/Scientific Meeting (NHRA 2020)

Place: Lusaka, Zambia via Zoom (Virtual)

Date: 26 August 2020

ISBN/ISSN:

Presenter and co-presenters: Malatji, W.R, Zuva, T. & van Eck, R.

Title of Paper: Acceptance of biometric authentication security technology on mobile devices

Conference: ICCCES 2020

Place: Coimbatore, India

Date: 21-22 October 2020

ISBN/ISSN: 1876-1100

Presenter and co-presenters: Moloto, M., Harmse, A. & Zuva, T.

Title of Paper: Impact of agile methodology use on project success in South African banking sector

Conference: ICCCES 2020
Place: Coimbatore, India
Date: 21-22, October 2020
ISBN/ISSN: 1876-1100

Presenter and co-presenter: Zuva, T. & Zuva, K.
Title of Paper: Virtual group movie recommendation system using social network information
Conference: ICCCES 2020
Place: Coimbatore, India
Date: 21-22, October 2020
ISBN/ISSN: 1876-1100

Presenter and co-presenter: Feukeu, E.A. & Zuva, T.
Title of Paper: Dynamic broadcast storm mitigation approach for VANETs
Conference: Future Generation Computer Systems
Place:
Date: 21-22, October 2020
ISBN/ISSN: 0167-739X

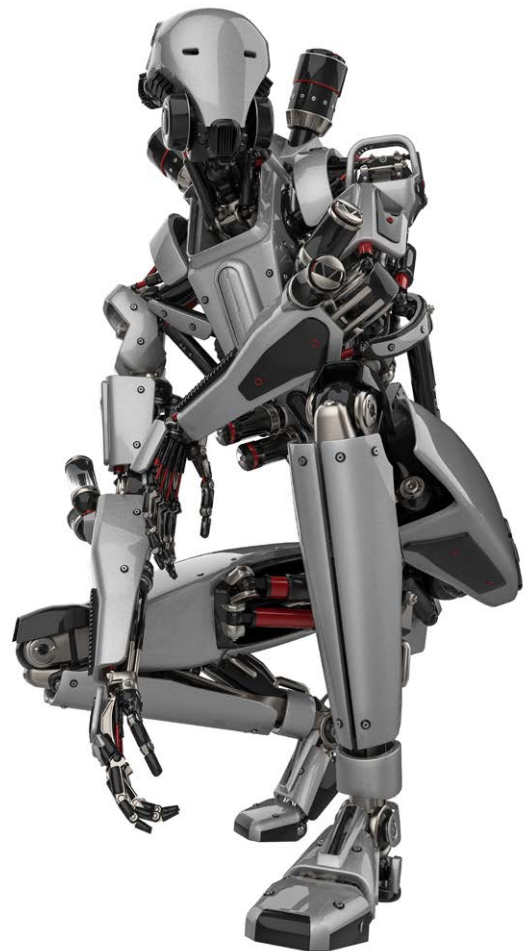
Presenter and co-presenters: Mokoena, T., Appiah, M. & Zuva, T.
Title of Paper: Understanding the usage, modifications, limitations and criticisms of technology acceptance model (TAM)
Conference: The 9th Computer Science On-line Conference (CSOC2020) in the Springer Series: Advances in Intelligent Systems and Computing
Place: Online
Date: June 2020
ISBN/ISSN: 2194-5357

Presenter and co-presenters: Oyetade, K.E., Zuva T. & Harmse, A.
Title of Paper: Technology adoption in education: a systematic literature review
Conference: The 9th Computer Science On-line Conference (CSOC2020) in the Springer Series: Advances in Intelligent Systems and Computing
Place: Online
Date: June 2020
ISBN/ISSN: 2194-5357

Presenter and co-presenters: Mhlongo, S., Oyetade, K.E. & Zuva, T.
Title of Paper: The effectiveness of collaboration using the hackathon to promote computer programming skills
Conference: IEEE International Multidisciplinary Information Technology and Engineering Conference (IEEE IMITEC 2020)
Place: Kimberley, South Africa
Date: 25-27 November 2020
ISBN/ISSN: 978-1-7281-9521-6

Presenter and co-presenters: Oyetade, K.E., Harmse, A. & Zuva, T.
Title of Paper: Technology adoption factors in education: a review
Conference: International Conference on Artificial Intelligence, Big Data, Computing and Data Communication Systems (icABCD 2020)
Place: Durban, South Africa
Date: 6-7 August
ISBN/ISSN: 978-1-7281-6769-5

Presenter and co-presenter: Mpela, M.D. & Zuva, T.
Title of Paper: A mobile proximity job employment recommender system
Conference: International Conference on Artificial Intelligence, Big Data, Computing and Data Communication Systems (icABCD 2020)
Place: Durban, South Africa
Date: 6-7 August 2020
ISBN/ISSN: 978-1-7281-6769-5



Presenter and co-presenters: Manamolela, L., Appiah, M. & Zuva, T.
Title of Paper: A survey of content-based filtering techniques for personalized recommendations
Conference: ACM International Conference on Intelligent and Innovative Computing Applications (ICONIC)
Place: Port Louis, Mauritius, Republic of Mauritius
Date: 24-25 September 2020
ISBN/ISSN: 978-1-4503-7558-0

Presenter and co-presenter: Iranga, E.K. & Zuva, T.
Title of Paper: Mobile crowdsourcing in crop production for farmers in rural areas of the South Kivu (DRC)
Conference: ACM International Conference on Intelligent and Innovative Computing Applications (ICONIC)
Place: Port Louis, Mauritius, Republic of Mauritius
Date: 24-25 September 2020
ISBN/ISSN: 978-1-4503-7558-0

Seminars/Workshops Presented

Title: Referencing styles
Presented to: Postgraduate students
Place: Vaal University of Technology
Date: April 2020
Publications (Books/Chapters in Books)
Author: Matli, W.
Chapter: The Changing Nature and Use of the Concept NEET in Contemporary Society: Normalising the NEET Age Cohort.

Title: Handbook of research on institutional, economic, and social impacts of globalization and liberalization
Publisher: IGI Global
Date: September 2020
Page numbers of chapter:394-411
ISBN: 9781799844594
Author: Pillay, M.
Chapter: Genome Editing Technologies for Crop Improvement

Title: Quantitative genetics, genomics and plant breeding
Publisher: Cabi
Date: April 2020
Page numbers of chapter:394-411
ISBN: 9781789240214
Author and co-author: Smith, M. & Pillay, M.
Chapter: An Overview of Genetic Improvement in Banana over the Last Century

Title: Achieving sustainable cultivation of bananas Vol 2
Publisher: Burleigh Dodds
Date: 2020

Page numbers of chapter:1-27
ISBN: 978-1-78676-344-0

Publications (Journals)

Author and co-authors: Brandi, A., Piersimoni, L., Feto, N.A., Spurio, R., Alix, J.H., Schmidt, F. & Gualerzi, C.
Title: Translation initiation factor IF2 contributes to ribosome assembly and maturation during cold adaptation
Journal: Nucleic Acid Research
Volume: 47
Issue: 9
Page numbers of article: 4652-4662
ISSN: 0305-1048

Author and co-author: Mitema, A. & Feto, N.A.
Title: Molecular and vegetative compatibility groups characterization of aspergillus flavus isolates from Kenya
Journal: AIMS Microbiology
Volume: 6
Issue: 3
Page numbers of article: 231-249
ISSN: 2471-1888

Author and co-authors: Madike, L.N., Pillay, M. & Popat, K.
Title: Antithrombogenic properties of tulbaghia violacea loaded polycaprolactone (PCL) nanofibers
Journal: Journal of Bioactive and Compatible Polymers
Volume: 35
Issue: 2, 2020
Page numbers of article: 102-116
ISSN: 15308030
DOI: <https://doi.org/10.1177%2F0883911520903748>

Author and co-authors: Madike, L.N., Takaidza, S., Ssemakalu, C. & Pillay, M.
Title: The effect of extracts of tulbaghia violacea on the proliferation of a murine macrophage cell line
Journal: South African Journal of Botany
Volume: 130
Issue: May 2020
Page numbers of article: 185-197
ISSN: : 02546299

Author and co-authors: Madike, L.N., Pillay, M., & Popat, K.
Title: In vitro cell adhesion, proliferation and differentiation of adipose derived stem cell on *Tulbaghia violacea* loaded polycaprolactone (PCL) nanofibers
Journal: Journal of Biomaterials and Tissue Engineering
Volume: 9
Issue: 11

Page numbers of article: 1485-1498
ISSN: 21579083
DOI: <https://doi.org/10.1166/jbt.2019.2184>

Author and co-authors: Wilson, V., Tenkouano, A. & Pillay, M.
Title: Paternal contribution to banana (*musa sapientum* L.) & plantain (*musa paradisiaca* L.) progenies & progeny ploidy composition in a polycross mating system using RAPD & flow cytometry
Journal: Asian Journal of Biochemistry, Genetics and Molecular Biology
Volume: 2
Issue: 4
Page numbers of article: 1-14
ISSN: 25823698

Author and co-authors: Pontsho, T.P., Mitema, A., Baburam, C. & Feto, N.A.
Title: Breakthroughs in the discovery and use of different peroxidase isoforms of microbial origin

Journal: AIMS Microbiology
Volume: 6
Issue: 3
Page numbers of article: 330-349
ISSN: DOI: <https://doi.org/10.3934/microbiol.2020020>

Author and co-authors: Mitema, A., Feto, N.A. & Rafudeen, M.S.
Title: Development and validation of TOF/Q-TOF MS/MS, HPLC method and in-vitro bio-strategy for aflatoxin mitigation
Journal: Food Additives & Contaminants: Part A
Volume: 37
Issue: 12
Page numbers of article: 2149-2164
ISSN: DOI: <https://doi.org/10.1080/19440049.2020.1815861>

Author and co-authors: Hadebe, M., Stegmann, P., Pierneef, R., Pandian, S. & Pillay, M.
Title: Genetic diversity of *seriphium plumosum* - a grassland encroacher plant in South Africa



Journal: Journal of Crop Improvement
Volume: DOI: 10.1080/15427528.2020.1828213
Issue:
Page numbers of article: online
ISSN: 15427528

Author: Matli, W.
Title: The changing work landscape as a result of the covid-19 pandemic: insights from remote worker's life situations in South Africa
Journal: International Journal of Sociology and Social Policy
Volume: 40
Issue: 9/10
Page numbers of article:1237- 1256
ISSN: 0144-333X

Author and co-author: Zewdu, T. & Zuva, T.
Title: A proactive university library book recommender system
Journal: 4th Computational Methods in Systems and Software 2020 in the Springer Series
Volume: 1295
Issue: 2020
Page numbers of article: 327-335
ISSN: 2194-5357

Author and co-authors: Manamolela, L., Appiah, M. & Zuva, T.
Title: Collaborative filtering recommendation systems algorithms, strengths and open issues
Journal: 4th Computational Methods in Systems and Software 2020 in the Springer Series
Volume: 1295
Issue: 2020
Page numbers of article: 148-163
ISSN: 2194-5357

Author and co-author: Kolo, D., & Zuva, T.
Title: E-learning readiness frameworks and models
Journal: 4th Computational Methods in Systems and Software 2020 in the Springer Series
Volume: 1295
Issue: 2020
Page numbers of article: 200-211
ISSN: 2194-5357

Author and co-authors: Moloto, M., Harmse, A. & Zuva, T.
Title: Impact of agile methodology use on project success in organizations - a systematic literature review
Journal: 4th Computational Methods in Systems and Software 2020 in the Springer Series
Volume: 1295
Issue: 2020

Page numbers of article: 267-280
ISSN: 2194-5357

Author and co-author: Olaifa, M.& Zuva, T.
Title: Principal component analysis enhanced multi-layer perceptron for multi-economic indicators in Southern African economic prediction
Journal: Software Engineering Perspectives in Intelligent Systems. CoMeSySo 2020
Volume: 1295
Issue: 2020
Page numbers of article: 674-684
ISSN: 2194-5357

Author and co-author: Zuva, J. & Zuva, T.
Title: Enhancing sustainable lifelong learning through competency-based education and training in Zimbabwe polytechnics
Journal: International Journal of Business and Management Studies
Volume: 12
Issue: 1
Page numbers of article: 133-146
ISSN: 1309-8047

Author and co-author: Julies, B.D. & Zuva, T.
Title: Review paper: IOT smart home issues, challenges and countermeasures
Journal: 4th Computational Methods in Systems and Software 2020 in the Springer Series
Volume: 1295
Issue: 2020
Page numbers of article: 1073-1089
ISSN: 2194-5357

Author and co-authors: Oyetade, K.E., Zuva, T. & Harmse, A.
Title: A systematic literature review, advances in science
Journal: Technology and Engineering Systems Journal
Volume: 5
Issue: 6
Page numbers of article:108-112
ISSN: 2415-6698

Author and co-authors: Malatji, W.R., van Eck, R. & Zuva, T.
Title: Understanding the usage, modifications, limitations and criticisms of technology acceptance model (TAM)
Journal: Advances in Science, Technology and Engineering Systems Journal (ASTESJ)
Volume: 5
Issue: 6

Author and co-authors: Moyo, M., Modise, S.J. & Pakade, V.E.
Title: Palladium nanoparticles dispersed on functionalized macadamia nutshell biomass for formic acid-mediated removal of chromium (VI) from aqueous solution
Journal: Science of the Total Environment
Volume: 743
Issue:
Page numbers of article: 140614
ISSN: 0048-9697

Author and co-authors: Moukangoe, G.P., Laloo, N., Pakade, V., Mtunzi, F., Monapathi, M.E., Modise, S.J. & Klink, M.J.
Title: Synthesis and antibacterial activity of cobalt-thiourea nanoparticles on selected waterborne bacterial pathogens
Journal: Digest Journal of Nanomaterials and Biostructures
Volume: 15
Issue: 3
Page numbers of article: 831-840
ISSN: 1842 3582

Author and co-authors: Xaba, B.M., Modise, S.J., Okoli, B.J., Monapathi, M.E. & Nelana, S.M.
Title: Characterization of selected polymeric membranes used in the separation and recovery of palladium-based catalyst systems
Journal: Membranes
Volume: 10
Issue: 8
Page numbers of article: 91-105
DOI: <https://doi.org/10.3390/membranes10080166>
ISSN: 2077 0375

Author and co-authors: Tsotetsi, L.K., Reddy, P., Modise, S.J. & Monapathi, M.E.
Title: Isolation and identification of xylanase producing thermophilic bacteria from compost piles and optimization of xylanase production
Journal: Journal of Biotech Research
Volume: 11



Issue:**Page numbers of article:** 122-132**ISSN:** 1944-3285**Author and co-authors:** Monapathi, M.E., Bezuidenhout, C.C. & Rhode, O.H.J.**Title:** Aquatic yeasts: diversity, characteristics and potential health implications**Journal:** Journal of Water and Health**Volume:** 18**Issue:** 2**Page numbers of article:** 91-105**DOI:** <https://doi.org/10.2166/wh.2020.270>**ISSN:** 1477 8920**Author and co-authors:** Monapathi, M.E., Bezuidenhout, C.C. & Rhode, O.H.J.**Title:** Physico-chemical parameters and culturable yeast diversity in surface water: a consequence of pollution**Journal:** Water SA**Volume:** 46**Issue:** 4**Page numbers of article:** 593–601**DOI:** <https://doi.org/10.17159/wsa/2020.v46.i4.9072>**ISSN:** 0378 4738**Author and co-authors:** Olayinka, S., Awofiranye & Sekomeng J. Modise & Naidoo, E.B.**Title:** Overview of polymer-TiO₂ catalyst for aqueous degradation of pharmaceuticals in heterogeneous photocatalytic process**Journal:** J. Nanopart. Res. (2020)**Volume:** 22**Issue:** 168**Page numbers of article:** 1-24**DOI:** <https://doi.org/10.1007/s11051-020-04877-9>**ISSN:** 1388 0764**Author and co-authors:** Olayinka, S., Awofiranye & Sekomeng J. Modise & Naidoo, E.B.**Title:** Design and synthesis of polyvinyl alcohol derived conjugated polyene modified TiO₂ for visible-light degradation of chloramphenicol**Journal:** Journal of Environmental Chemical Engineering**Volume:** 8**Issue:** 3, June 2020, 103755**Page numbers of article:** n.a.**DOI:** <https://doi.org/10.1016/j.jece.2020.103755>**ISSN:** 2213 3437

Research in Progress

Researcher: Chalwe, J.M.**Title:** Impact of soya bean on the 17 β -estradiol status and biochemical markers of cardiovascular disease in postmenopausal women from a peri-urban South African community**Field:** Biotechnology**Researcher:** Mosia, E.M.**Title:** Analyses and treatment of potable water in Parys municipality with nanofiltration polymer membranes**Field:** Membrane Technology, Water Quality Monitoring**Researcher:** Mgiba, N.G.**Title:** Detection and photodegradation of selected endocrine disrupting compounds from drinking water sources in Letlhabile, North West province, South Africa.**Field:** Water Quality Monitoring, Catalysis**Researcher:** Chauke, T.D.M.**Title:** Monitoring and electrocoagulation supported membrane treatment of wire galvanizing effluent plant in Vanderbijlpark, South Africa**Field:** Membrane Technology, Water Quality Monitoring, Electrolysis**Researcher:** Twala, J.**Title:** The efficacy of drinking water plant in (Parys) Ngwathe municipality using physico-chemical and microbial indices**Field:** Membrane Technology, Water Quality Monitoring, Electrolysis**Researcher:** Monapathi, M.E.**Title:** Water quality and bacterial population of wetlands in the Vaal, Gauteng province, South Africa**Field:** Water Quality Monitoring

Contract Research

Research Partnerships/Collaboration

Researchers: Ralekoa, Ms W.

Title of research: Water quality monitoring in Letlhabile**Company:** Magalies Water**Industry:** Water Board**International:** n.a.

Research Partnerships with International Universities/ Collaboration

Researchers: Oldewage-Theron, Prof W.H.

Title of research: Nutritional status and cardiovascular disease

Higher Education Institution: Texas Tech University or Company, USA

Researchers: Oldewage-Theron, Prof W.H.

Title of research: Impact of soya bean on the 17β -estradiol status and biochemical markers of cardiovascular disease in postmenopausal women from a peri-urban South African community

Higher Education Institution: Texas Tech University, USA

Researchers: Hewetson, Dr M.

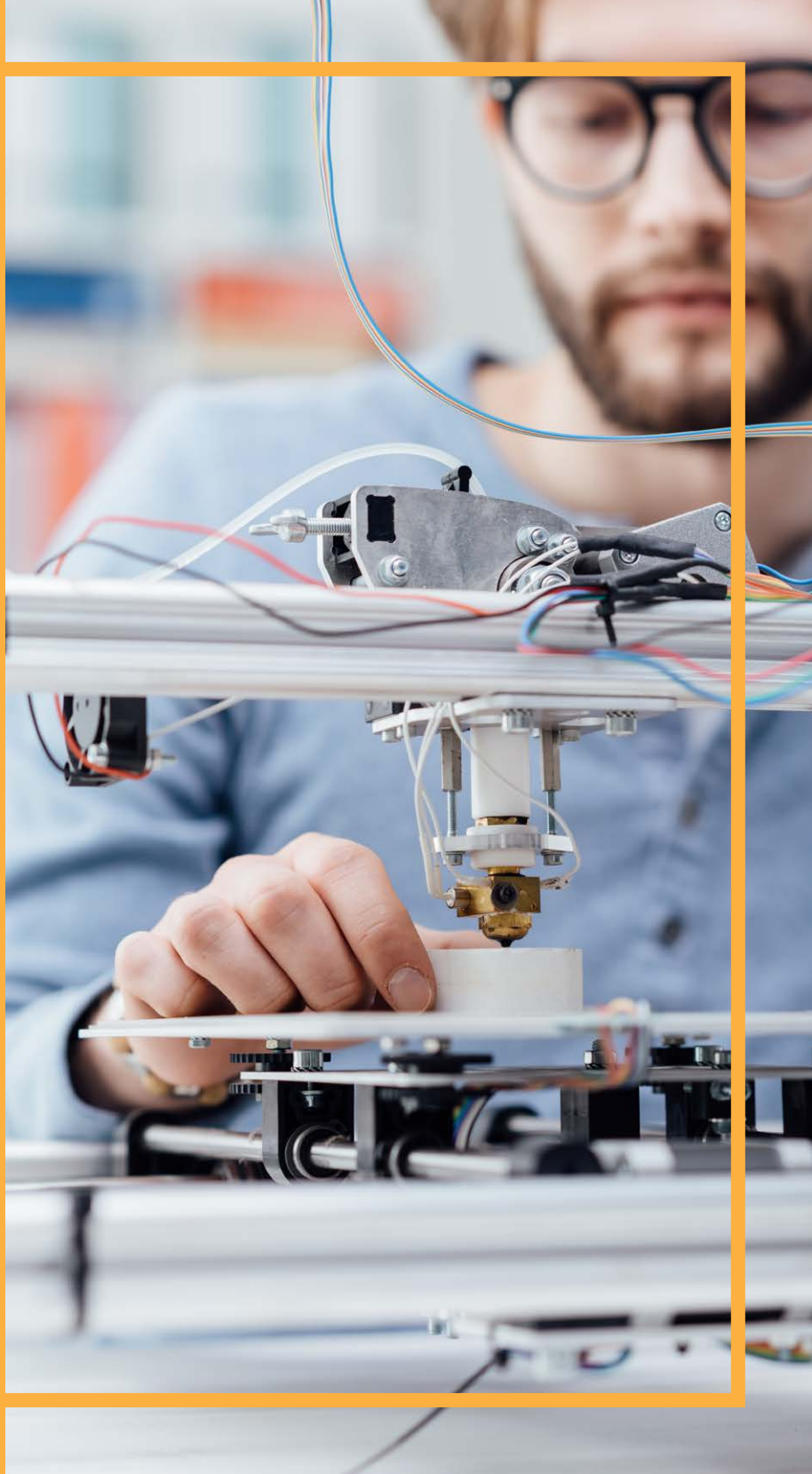
Title of research: Troponin as prognostic marker in African horse sickness

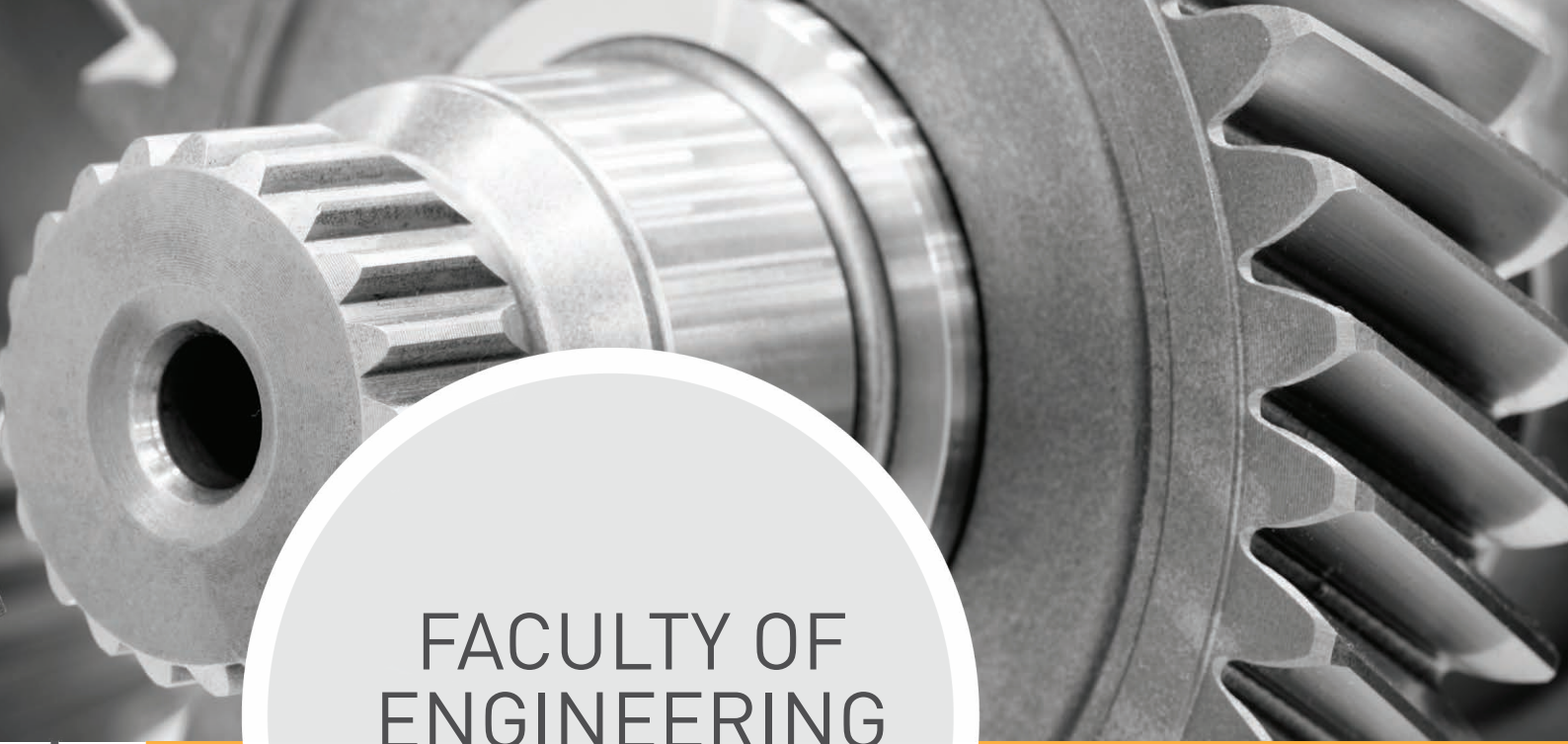
Higher Education Institution: The Royal Veterinary College, UK

Researchers: Takaba, H.

Title of research: Membrane Technology

Higher Education Institution: Kogakuin University





FACULTY OF ENGINEERING & TECHNOLOGY

MESSAGE FROM THE EXECUTIVE DIRECTOR

PROF P.O. OSIFO



The foundation of academic development is based on research which forms the bedrock of academic achievement. The Faculty of Engineering has used this thinking to strategically push research to form a greater part of the faculty academic development.

The foundation of academic development is based on Research which forms the bedrock of academic achievement. The Faculty of Engineering has used this thinking to strategically push Research to create a more significant part of the faculty academic development.

To improve innovation and commercialisation, the Faculty refocused its Research Strategy to address the most challenging issues in the world today such as unprecedented energy challenges, water resources, pollution control and digital information technology.

Therefore, most of the Faculty Research undertaken is built around renewable/alternative energy, water treatment and reuse, and air pollution control. Kindly note that research in these areas formed part of the drive in meeting the Institutional Strategic Research Objectives and the goals of the National Vision-2030.

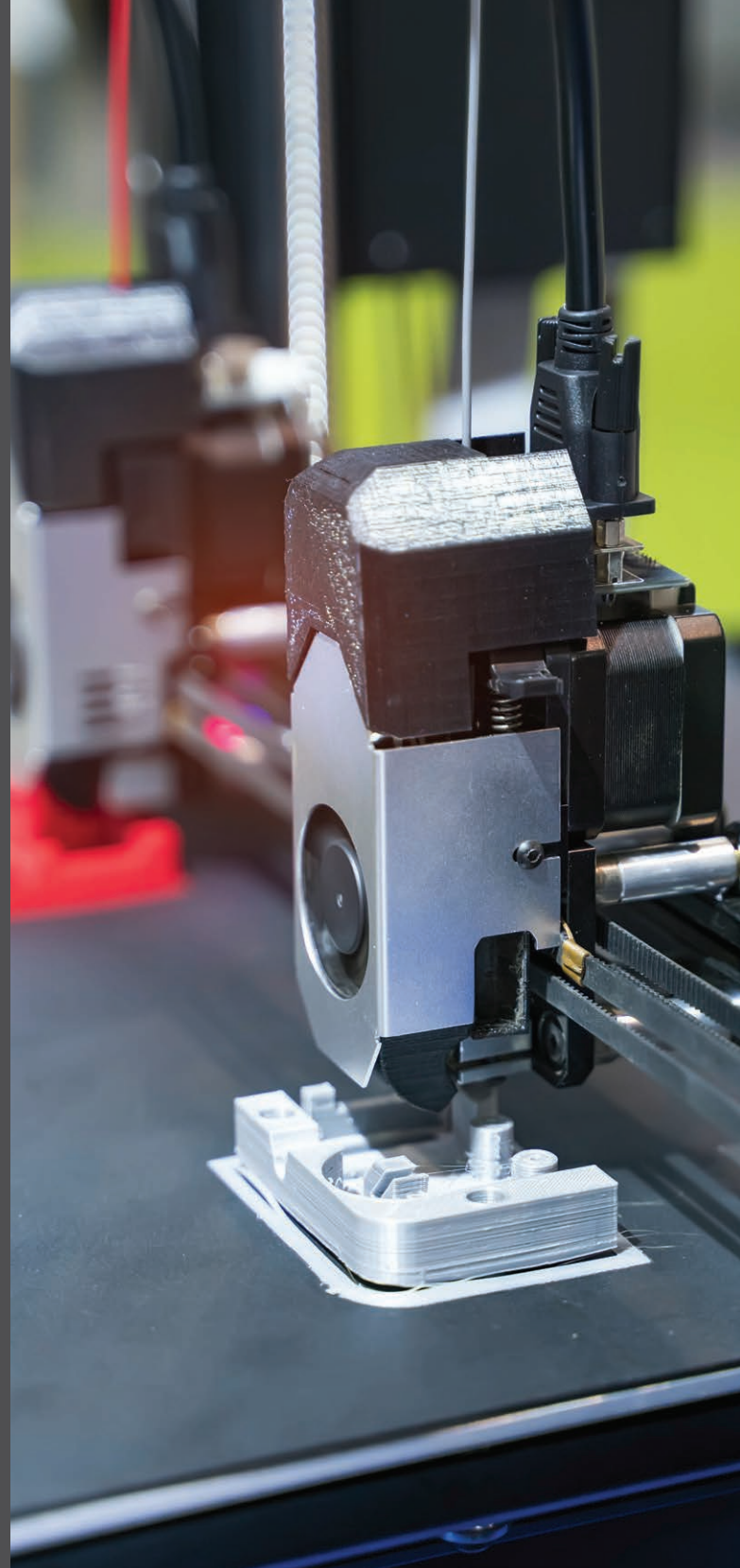
Therefore, it is evident that the Faculty has aligned its priorities to the demands/needs of future challenges. The digital technology, which addresses the 4IR skills shortage, is anchored in some of the Research Projects in the Faculty.

In an attempt to support the faculty research endeavour the Faculty has developed a Master's degree of Engineering in Energy Efficiency. More than 25 students have been registered since the start of the course being offered in January 2020. There is also an ongoing development for a Master's degree in Engineering in Engineering Education that may start in 2022.

Despite the Covid-19 pandemic that almost ravaged societal activities in 2020, especially the impact on the University Academic Plan of 2020, the Faculty was still able to maintain its pursuit to achieve the Faculty Research Strategic Objectives.

The Faculty continued its engagement in more vital terms through collaboration with industries, institutions and research organisations. These include amongst others SASOL, Eskom, Telkom, CHIETA, WRC, NRF, CSIR, and PEESA. Indeed, these collaborations have pushed the research capacity to a higher level of achievement within the Institution. This is evidenced by the increase in the Research Outputs in recent years, and in the numbers of postgraduate students involved in the Research Projects due to the funding supports received from our collaborators.

PROF P.O. OSIFO



Postgraduate Staff and Students Qualifications Completed in 2020

Name: Kohitlhetse, I.C

Qualification: MEng

Dissertation/Thesis Title: An investigation into the effect of physico-chemical factors affecting the extraction of calcium from iron and steel slag

University/Institution: Vaal University of Technology

Name: Nhlapo, M

Qualification: MTech

Dissertation/Thesis Title: Impact of equal channel angular pressing operational parameters on the mechanical properties of characterised titanium-based powders

University/Institution: Vaal University of Technology

Name: Vilakazi, L.N

Qualification: MTech

Dissertation/Thesis Title: Identification and analysis of steam temperature maldistribution in super heater tubes via measured and derived parameters

University/Institution: Vaal University of Technology

Name: Sozinando, D.F

Qualification: MEng

Dissertation/Thesis Title: Identification and analysis of steam temperature maldistribution in super heater tubes via measured and derived parameters

University/Institution: Vaal University of Technology

Name: Mphahlele, K

Qualification: MTech

Dissertation/Thesis Title: Characterisation of streams and performance evaluation of the coprolysis of sewage sludge and lignite for bio-oil production

University/Institution: Vaal University of Technology

Name: Seodigeng, R.C.F

Qualification: MEng

Dissertation/Thesis Title: Characterisation of streams and performance evaluation of the coprolysis of sewage sludge and lignite for bio-oil production

University/Institution: Vaal University of Technology

Name: Ojo-Sereki, D.F

Qualification: MEng

Dissertation/Thesis Title: Design and implementation of personal health data monitoring and retrieval system for health providers

University/Institution: Vaal University of Technology

Name: Mbedzi, R

Qualification: MEng

Dissertation/Thesis Title: Optimisation of iron exchange process on the removal of heavy metals from cooling tower water and regeneration of ion exchange

University/Institution: Vaal University of Technology

Name: van Rooyen, J

Qualification: MTech

Dissertation/Thesis Title: A testing and verification protocol for a modern bus bar transfer scheme based on the transfer philosophy and theory of voltage decay

University/Institution: Vaal University of Technology

Name: Chingowo, S.T

Qualification: MTech

Dissertation/Thesis Title: Effect of furnace atmosphere during heat treatment on the microstructure, residual stress and alpha casing of Ti6Al4V components produced by additive manufacturing

University/Institution: Vaal University of Technology

Name: Cobbinah, P.V

Qualification: MTech

Dissertation/Thesis Title: The evaluation of Ta contents on strengthening effect and oxidation resistance of gamma titanium aluminide (γ -TiAl-%Ta) alloys

University/Institution: Vaal University of Technology

Name: Mogale, N.F

Qualification: MTech

Dissertation/Thesis Title: The effect of chromium addition on the microstructure and mechanical properties of Ti-aluminides intermetallics

University/Institution: Vaal University of Technology

Name: Nemavhola, M. K

Qualification: MTech

Dissertation/Thesis Title: Development of a potentially low young's modulus (Ti-34Nb-25Zr-XFe) base alloy for orthopaedic device application

University/Institution: Vaal University of Technology

Name: Okoli, O.U

Qualification: MTech

Dissertation/Thesis Title: Development of a multifunctional titanium alloy surface by laser processing

University/Institution: Vaal University of Technology

Name: Kohitlhetse, I.C

Qualification: MTech

Dissertation/Thesis Title: An investigation into the effect of

physico-chemical factors affecting the extraction of calcium from iron and steel slag

University/Institution: Vaal University of Technology

Name: Mvoulabolo, M

Qualification: MEng

Dissertation/Thesis Title: Design and implementation of an inventory management system in libraries using radio frequency identification technology

University/Institution: Vaal University of Technology

Name: Oluokun, O.O

Qualification: MTech

Dissertation/Thesis Title: Selective recovery of base and precious metals from printed circuit board physical processing dust

University/Institution: Vaal University of Technology

Name: Chiliza, M.Z.M

Qualification: MEng

Dissertation/Thesis Title: Acid mine drainage remediation using pyrite coated with silane

University/Institution: Vaal University of Technology

Name: Tebo, E.P.T

Qualification: MEng

Dissertation/Thesis Title: Lateral torsional stability of curved 6061-T6 structural aluminium alloys

University/Institution: Vaal University of Technology

Name: Matsimbi, M

Qualification: MEng

Dissertation/Thesis Title: Topology optimisation of a unitary automotive chassis: chassis design through simple structural surfaces and finite element analysis methods

University/Institution: Vaal University of Technology



Name: Andezai, A. M

Qualification: MEng

Dissertation/Thesis Title: Experimental investigation of dynamic elastic properties of particulate composites

University/Institution: Vaal University of Technology

Name: (Bele) Gabara, T

Qualification: MTech

Dissertation/Thesis Title: Redesigning a computer rail system to accommodate passengers with special needs

University/Institution: Vaal University of Technology

Name: Sob, P.B

Qualification: DTech

Dissertation/Thesis Title: Controllability and stability of selectively wettable nanostructured membrane for oil/water separation

University/Institution: Vaal University of Technology

Name: Alo, A

Qualification: DTech

Dissertation/Thesis Title: Development of conducting multiphase polymer composite for fuel cell bipolar plate

University/Institution: Vaal University of Technology

Name: Igberase, E

Qualification: PhD

Dissertation/Thesis Title: The adsorption of heavy metal ions by chitosan derivatives in synthesised acid mine drainage

University/Institution: Vaal University of Technology

Name: Tewo, R

Qualification: PhD

Dissertation/Thesis Title: Thermomechanical and rheological properties of investment casting patterns

University/Institution: Vaal University of Technology

Name: Motsetse, C.K

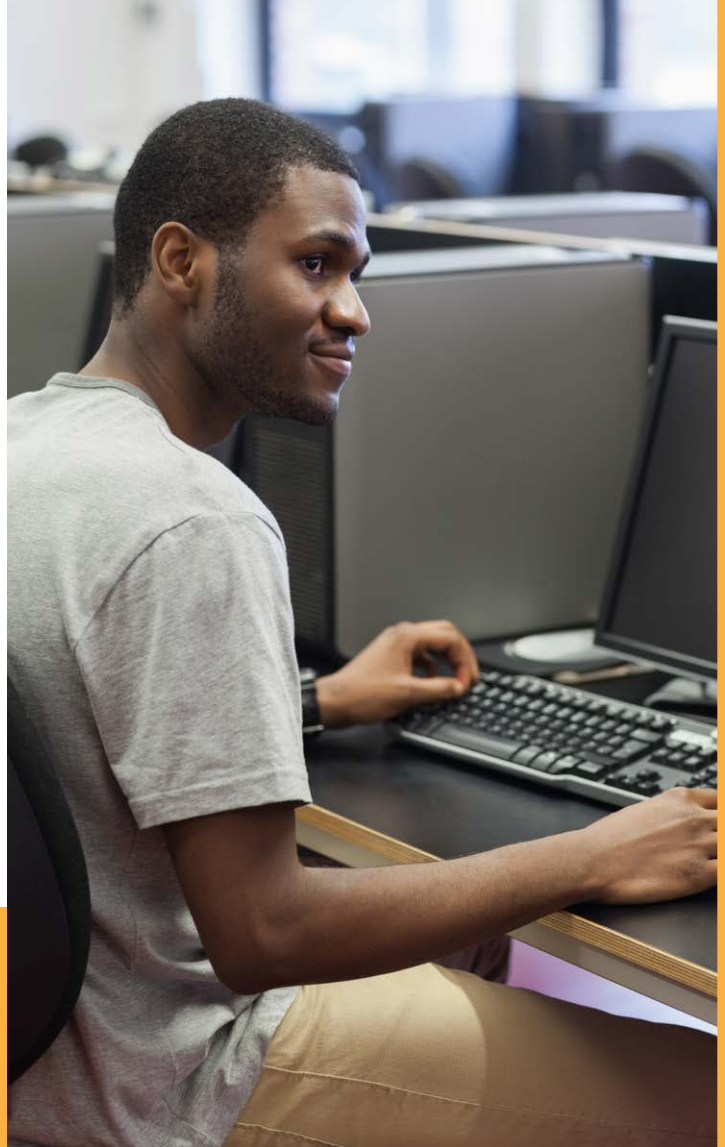
Qualification: Doctor of Engineering in Metallurgical Engineering

Dissertation/Thesis Title: Process design for concentration and extraction of nickel from a South African nickel laterite ore

University/Institution: Tshwane University of Technology

Conferences (Papers and posters presented)

Presenter and co-presenter: Prithiraj, A., Merwe, J. Otunniyi, I. O. & Osifo, P.



Title of Paper: Copper alloys Cu-Ni (70-30) and Cu-Ni (90-10) exposed to a mixed bacterial culture found in cooling towers

Conference: Global Virtual Summit on Materials Science and Engineering: Materials Science for better Future

Place:

Date: 28-30 August 2020

ISBN/ISSN:

Presenter and co-presenter: Okoli, U.O., Otunniyi, I. O, & Adebisi, D.I.

Title of Paper: Dry sliding wear behaviour of binary powder laser cladded Ti-6Al-4V using SiC and Al

Conference: International Symposium on Nanostructured, Nanoengineered and Advanced Materials

Place: Johannesburg, South Africa
Date:
ISBN/ISSN: Material Today: Proceedings
URL: <https://doi.org/10.1016/j.matpr.2020.05.560>

Presenter and co-presenter: Alo, A. O., Otunniyi, I. O., Pienaar, H.C.vZ. & Sadiku, E.R.
Title of Paper: Electrical and mechanical properties of polypropylene/epoxy blend-graphite/carbon black composite for proton exchange membrane fuel cell bipolar plate
Conference: International Symposium on Nanostructured, Nanoengineered and Advanced Materials
Place: Johannesburg, South Africa
Date:
ISBN/ISSN: Materials Today: Proceeding
URL: <https://doi.org/10.1016/j.matpr.2020.03.642>

Presenter and co-presenter: Mogale, N., Matizamhuka, W., Machaka, R., Shongwe, M. & Yamabe-Mitarai, Y.
Title of Paper: The effect of Cr additions and oxidation on densification, microstructure, phase constituents and mechanical properties of TiAlCr alloys produced by SPS
Conference: ISNNAM 2020 Conference
Place: Virtual
Date: 28 April-03 May 2020
ISBN/ISSN: 2214-7853

Presenter and co-presenter: Mahundla, M.R., Matizamhuka, W.R. & Shongwe, M.B.
Title of Paper: The effect of densification on hardness of Ti, Ti-6Al-4V, Ti-34Nb-25Zr alloy produced by spark plasma sintering
Conference: ISNNAM 2020 Conference
Place: Virtual
Date: 28 April-03 May 2020
ISBN/ISSN: 2214-7853

Presenter and co-presenter: Cobbinah, P.V., Matizamhuka, W., Machaka, R., Shongwe, M.B. & Yamabe-Mitarai, Y.
Title of Paper: The high-temperature performance of Ti-46.5 Al-% xTa (x= 0.8, 4 and 8 at.%) alloys produced using SPS.
Conference: ISNNAM 2020 Conference
Place: Virtual
Date: 28 April-03 May 2020
ISBN/ISSN: 2214-7853

Presenter and co-presenter: Bekker, W.J. & Viljoen, M.
Title of Paper: 25-kW grid-tie solar system for the engineering s-building at Vaal University of Technology in Vanderbijlpark, South Africa

Conference: EU PVSEC
Place: Online
Date: 07-10 September 2020
ISBN/ISSN: 3-936338-73-6/2196-0992

Presenter and co-presenter: Viljoen, M. & Bekker, W.J.
Title of Paper: Optimisation of a 4.6-kW residential hybrid solar photovoltaic (PV) system – a case study
Conference: EU PVSEC
Place: Online
Date: 07-10 September 2020
ISBN/ISSN: 3-936338-73-6/2196-0992

Publications (Books/Chapters in Books)

Author and co-authors: Nturanabo, F., Masu, L.M. & Kirabira, J.B.
Chapter: Novel applications of Aluminium metal matrix composites
Title: Aluminium alloys and composites
Publisher: IntechOpen
Date: 10 May 2020
Page numbers of chapter: 71-94
ISBN: 978-1-78984-515-0

Author and co-authors: Tebo, E.T., Masu, L.M. & Nziu, P.K.
Chapter: Effects of Factors That Influence Out-of-Plane Lateral-Torsional Buckling on Freestanding Circular Arches
Title: Advanced aspects of engineering research
Publisher: Book Publisher International
Date: 08 December 2020
Page numbers of chapter: (12 pages)
ISBN: 978-93-90149-84-1

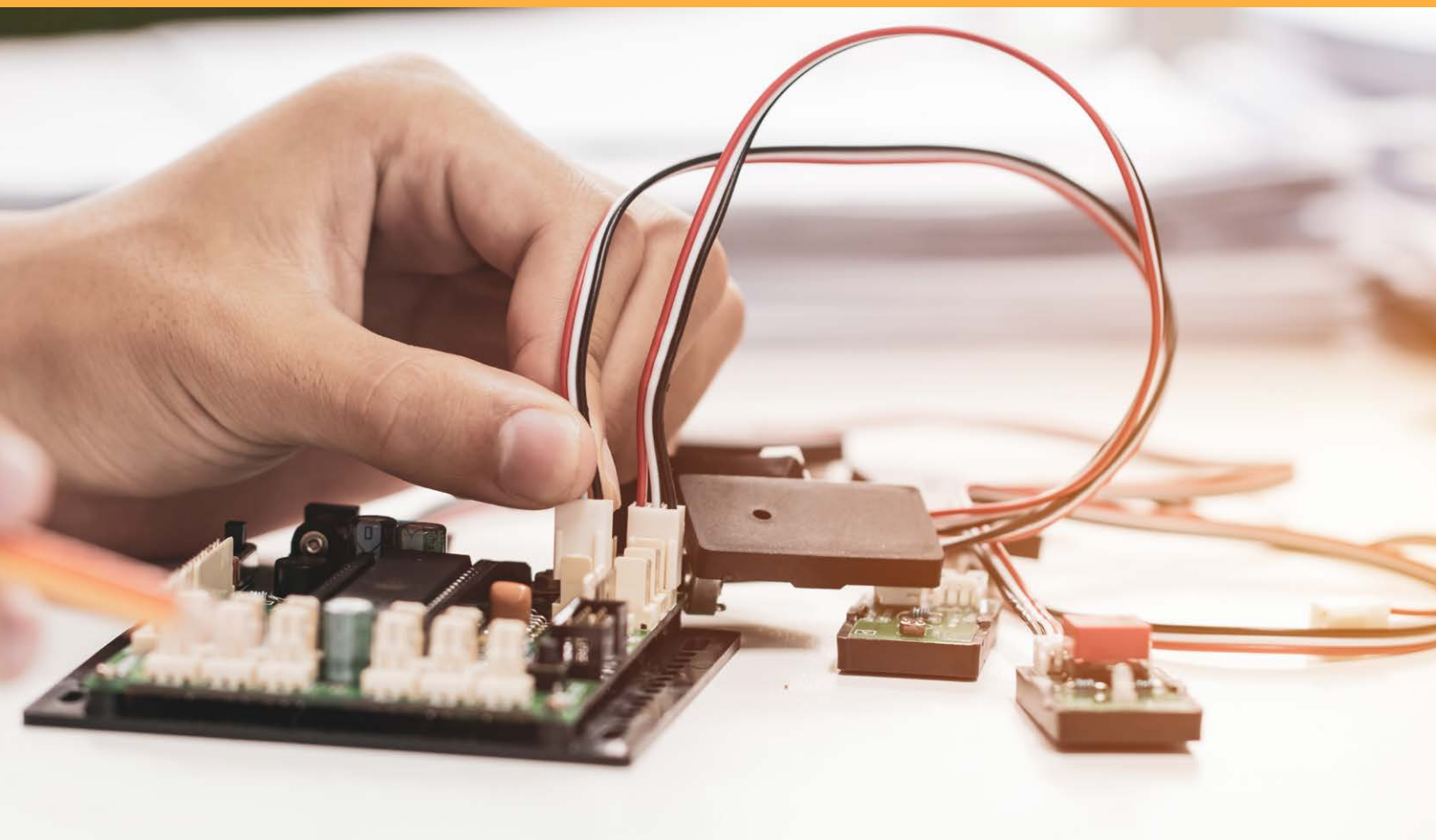
Publications (Journals)

Author and co-authors: Oyewole, G.J
Title: Heuristic to solve the fixed charge solid location and transportation problem with truck-load constraint
Journal: 31st Annual Southern African Institute for Industrial Engineering Conference
Place: Virtual, South Africa
Date: 05-07 October 2020
Page numbers of article: 484-495
ISSN: 2308-8265

Author and co-authors: Muhanelwa, T.J., Sob, P.B., Alugongo, A.A. & Tengen, T.B.
Title: The design of spray nozzle for washing aggregates in the mining industry
Conference: 2nd African International Conference on Industrial Engineering and Operations Management
Place: Harare, Zimbabwe
Date: 08-10 December 2020
Page numbers of article: 400-410
ISSN: 2169-8767 (U.S. Library of Congress)

Page numbers of article: 300-315
ISSN: 2169-8767 (U.S. Library of Congress)

Author and co-authors: Oyewole, G.J
Title: Heuristic to solve the fixed charge solid location and transportation problem with truck-load constraint
Journal: 31st Annual Southern African Institute for Industrial Engineering Conference
Place: Virtual, South Africa
Date: 05-07 October 2020



Author and co-authors: Lekalakala, T.S., Sob, P.B., Alugongo, A.A. & Tengen, T.B.
Title: Improving the efficiency and stability of a centrifugal pump filtration system using membrane system
Journal: 2nd African International Conference on Industrial Engineering and Operations Management
Place: Harare, Zimbabwe
Date: 08-10 December 2020

Page numbers of article: 484-495
ISSN: 2308-8265

Author and co-authors: Muiruri, A., Maringa, M., du Preez, W. & Masu, L.M.
Title: The effect of stress relieving heat treatment on the high strain rate dynamic compressive properties of additively manufactured Ti6Al4V(ELI)

Journal: Journal of Metals 2020

Volume: 10

Issue: 5

Page numbers of article: 653-55

ISSN: <http://doi.org/10.3390/met10050653>

Author and co-authors: Andezai, A.M., Masu, L.M. & Maringa, M.

Title: experimental investigation of dynamic elastic properties of reinforced coconut shell powder/epoxy resin composites

Journal: International Journal for Engineering Research and Technology

Volume: 13

Issue: 10

Page numbers of article: 2712-2719

ISSN: 0974-3154

Author and co-authors: Andezai, A.M., Masu, L.M. & Maringa, M.

Title: Investigating the mechanical properties of reinforced coconut shell powder/epoxy resin composites

Journal: International Journal for Engineering Research and Technology

Volume: 13

Issue: 10

Page numbers of article: 2742-2751

ISSN: 0974-3154

Author and co-authors: Andezai, A.M., Masu, L.M. & Maringa, M.

Title: Chemical and morphological characterisation of coconut shell powder, epoxy resin and coconut shell powder/epoxy resin composites

Journal: International Journal for Engineering Research and Technology

Volume: 13

Issue: 12

Page numbers of article: 4269-4275

ISSN: 0974-3154

Author and co-authors: Bichanga, D.O., Masu, L.M. & Nziu, P.K.

Title: Bioplastics properties of fish scales and their effects on the mechanical properties in biocomposites: a review

Journal: International Journal for Engineering Research and Technology

Volume: 13

Issue: 12

Page numbers of article: 4297-4304

ISSN: 0974-3154

Author and co-authors: Maube, O. & Masu, L.M.

Title: Ann based prediction of performance and emission characteristics of a diesel engine fueled by distilled tyre pyrolysis oil

Journal: International Journal for Engineering Research and Technology

Volume: 13

Issue: 9

Page numbers of article: 2124-2131

ISSN: 0974-3154

Author and co-authors: Matsimbi, M., Masu, L.M., Maringa, M. & Nziu, P.K.

Title: Topology optimisation of automotive body structures; a review

Journal: International Journal for Engineering Research and Technology

Volume: 13

Issue: 12

Page numbers of article: 4282-4296

ISSN: 0974-3154

Author and co-authors: Matsimbi, M., Nziu, P.K., Masu, L.M. & Maringa, M.

Title: A review of methods used to determine the overall stiffness of unitary automotive body structures

Journal: International Journal for Engineering Research and Technology

Volume: 13

Issue: 12

Page numbers of article: 4666-4678

ISSN: 0974-3154

Author and co-authors: Kiplagat, N., Masu, L.M. & Nziu, P.K.

Title: Effects of geometric stress concentration in the design of thick compound cylinders- a review

Journal: International Journal for Engineering Research and Technology

Volume: 13

Issue: 9

Page numbers of article: 2252-2265

ISSN: 0974-3154

Author and co-authors: Nziu, P.K. & Masu, L.M.

Title: Elastic strength of high-pressure vessels with an offset circular cross bore

Journal: International Journal of Mechanical and Production Engineering Research and Development

Volume: 10

Issue: 3

Page numbers of article: 655-662

ISSN: 2249-6890

Author and co-authors: Nziu, P.K. & Masu, L.M.

Title: Cross bore size and thickness ratio effects on stress distribution along the transverse plane of a radial circular cross bore in elastic pressurised pressure vessels

Journal: International Journal of Mechanical and Production Engineering Research and Development (IJMPERD)

Volume: 10

Issue: 3

Page numbers of article: 997-1006

ISSN: 2249-6890

Author and co-authors: Nziu, P.K. & Masu, L.M.

Title: Elastic strength of high-pressure vessels with an offset elliptical cross bore

Journal: International Journal of Mechanical and Production Engineering Research and Development

Volume: 10

Issue: 3

Page numbers of article: 4897-4914

ISSN: 2249-6890

Author and co-authors: Nziu, P.K. & Masu, L.M.

Title: Comparison of elastic strength between high pressure vessels having circular and elliptical cross bores at radial and offset positions

Journal: International Journal of Engineering Research and Technology

Volume: 13

Issue: 8

Page numbers of article: 1813-1822

ISSN: 0974-3154

Author and co-authors: Nziu, P.K. & Masu, L.M.

Title: Formulae to predict elastic axial stresses across the transverse edge of a radial circular cross-bore in thick walled cylinders

Journal: International Journal of Engineering Research and Technology

Volume: 13

Issue: 9

Page numbers of article: 2332-2342

ISSN: 0974-3154

Author and co-authors: Nziu, P.K. & Masu, L.M.

Title: Behavioural trend of radial stress along a radial circular cross bore in thick walled cylinders

Journal: International Journal of Engineering Research and Technology

Volume: 13

Issue: 9

Page numbers of article: 2343-2346

ISSN: 0974-3154

Author and co-authors: Nziu, P.K. & Masu, L.M.

Title: Formulae to predict elastic hoop stresses across the transverse edge of a large radial circular cross bore in thick cylinders

Journal: International Journal of Engineering Research and



Technology

Volume: 13

Issue: 10

Page numbers of article: 3048-3054

ISSN: 0974-3154

Author and co-authors: Nziu, P.K. & Masu, L.M.

Title: Effects of offset oblique circular cross bores on elastic pressurised thick-walled cylinders

Journal: International Journal of Engineering Research and Technology

Volume: 13

Issue: 12

Page numbers of article: 4311-4317

ISSN: 0974-3154

Author and co-authors: Ladipo, T.L., Masu, L.M. & Nziu, P.K.

Title: Solid additives and their lubrication effects on polyetheretherketone polymers – a review

Journal: International Journal of Engineering Research and Technology

Volume: 13

Issue: 12

Page numbers of article: 4262-4268

ISSN: 0974-3154

Author and co-authors: Tebo, E.T., Masu, L.M. & Nziu, P.K.

Title: Effects of factors that influence out-of-plane lateral-torsional buckling on freestanding circular arches

Journal: Journal of Engineering, Design and Technology

Volume: 2020



Issue:

Page numbers of article:

ISSN: <https://doi.org/10.1155/2020/4892070>

Author and co-authors: Tebo, E.T., Masu, L.M. & Nziu, P.K.

Title: Comparison between elastic and inelastic lateral torsional buckling load on circular fixed channel section arches under transverse point load

Journal: International Journal of Engineering Research and Technology

Volume: 13

Issue: 9

Page numbers of article: 2239-2254

ISSN: 09743154

Author and co-authors: Tebo, E.T., Masu, L.M. & Nziu, P.K.

Title: Inelastic lateral-torsional buckling load on fixed circular channels arches under transverse point load

Journal: International Journal of Engineering Research and Technology

Volume: 13

Issue: 10

Page numbers of article: 2851-2863

ISSN: 09743154

Author and co-authors: Tebo, E.T., Masu, L.M. & Nziu, P.K.

Title: Elastic lateral-torsional buckling load on circular fixed channels arches under transverse point load

Journal: International Journal of Engineering Research and Technology

Volume: 13

Issue: 10

Page numbers of article: 2870-2883

ISSN: 09743154

Author and co-authors: Webo, W., Maringa, M. & Masu, L.M.

Title: The combined effect of mercerisation, silane treatment and acid hydrolysis on the mechanical properties of sisal fibre/epoxy resin composites

Journal: MRS Advances © 2020 Materials Research Society

Volume: 2020

Issue:

Page numbers of article:

ISSN: DOI: 10.1557/adv.2020.122

Author and co-authors: Webo, W., Masu, L.M. & Maringa, M.

Title: The morphology and thermal behaviour of treated and untreated sisal fibre-epoxy resin composites

Journal: International Journal of Engineering Research and Technology

Volume: 10

Issue: 2

Page numbers of article: 1285–1294
ISSN: 0974-3154

Author and co-authors: Webo, W., Masu, L.M., Maringa, M. & Nziu, P.K.
Title: A review of the state of research and utilisation of biomaterials in the manufacture of composite materials to date
Journal: International Journal of Engineering Research and Technology
Volume: 13
Issue: 6
Page numbers of article: 1065-1075
ISSN: 0974-3154

Author and co-authors: Webo, W., Maringa, M., Nziu, P.K. & Masu, L.M.
Title: Nanocellulose and their composites: a review
Journal: International Journal of Mechanical and Production Engineering Research and Development
Volume: 10
Issue: 3
Page numbers of article: 793-800
ISSN: 2249-6890

Author and co-authors: Tlhabadira, I., Daniyan, I., Masu, L.M. & Mpofu, K.
Title: Development of a model for the optimisation of energy consumption during the milling operation of titanium alloy (Ti6Al4V)
Journal: International symposium on Nanostructured, Nanoengineered and Advanced Materials: Materials Today: Proceedings
Volume: ISNNAM 2020
Issue:
Page numbers of article:
ISSN:

Author and co-authors: Letwaba, L.J., Tlhabadira, I., Daniyan, I.A., Seerane, M., Sadiku, E.R. & Masu, L.M.
Title: Development and micrograph analysis of beta-SiAlONs produced by spark plasma sintering
Journal: International symposium on Nanostructured, Nanoengineered and Advanced Materials: Materials Today: Proceedings
Volume: ISNNAM 2020
Issue:
Page numbers of article:
ISSN:

Author and co-authors: Tlhabadira, I., Daniyan, I., Masu, L.M. & Mpofu, K.
Title: Computer aided modelling and experimental validation

for effective milling operation of titanium alloy (Ti6Al4V)
Journal: Procedia CIRP 91
Volume: Procedia CIRP 91 (2020)
Issue:
Page numbers of article: 113-120
ISSN: CIRP 00 (2017) 000–000

Author and co-authors: Ilesanmi, D., Tlhabadira, I., Phokobye, S., Mrausi, S., Mpofu, K. & Masu, L.M.
Title: Modelling and optimisation of the cutting parameters for the milling operation of titanium alloy (Ti6Al4V)
Journal: 2020 IEEE
Volume: 11th International Conference on Mechanical and Intelligent Manufacturing Technologies
Issue:
Page numbers of article: 68-72
ISSN: 978-1-7281-5332-2/20/\$31.00

Author and co-authors: Tchomeni, B.X., Sozinando, D.F. & Alugongo, A.A.
Title: Influences of hydrodynamic forces on the identification of the rotor-stator-rubbing fault in a rotating machinery
Journal: International Journal of Rotating Machinery
Volume: 2020
Issue: 1
Page numbers of article: 18
ISSN: 1542-3034

Author and co-authors: Tchomeni, B.X. & Alugongo, A.A.
Title: Theoretical and experimental analysis of an unbalanced and cracked twin-rotor in the vicinity of the critical speed
Journal: Mathematical Models in Engineering
Volume: 6
Issue: 1
Page numbers of article: 34-49
ISSN: 13928716

Author and co-authors: Sob, P., Alugongo, A.A. & Tengen, T.B.
Title: A Conceptual model based on nanoscience and nanotechnology in design of smart home for energy efficiency operation
Journal: International Journal of Engineering Research and Technology.
Volume: 13, Number 1 (2020)
Issue:
Page numbers of article: 100-106
ISBN: 0974-3154

Author and co-authors: Sob, P.B., Alugongo, A.A. & Tengen, T.B.
Title: The stochastic effect of nanoparticles inter-separation distance on membrane wettability during oil/water separation
Journal: International Journal of Engineering Research and

Technology

Volume: 13, Number 5 (2020)

Issue:

Page numbers of article: 742-766

ISBN: 0974-3154

Author and co-authors: Muhanelwa, T.J., Sob, P.B., Alugongo, A.A. & Tengen, T.B.

Title: The design of spray nozzle for washing aggregates in the mining industry

Conference: International Conference on Industrial Engineering and Operations Management

Volume: 2nd African International Conference on Industrial Engineering and Operations Management, online Harare, Zimbabwe, December 8-10, 2020

Issue:

Page numbers of article: 400-410

ISSN: 2169-8767 (U.S. Library of Congress)

Author and co-authors: Lekalakala, T.S., Sob, P.B., Alugongo, A.A. & Tengen, T.B.

Title: Improving the efficiency and stability of a centrifugal pump filtration system using membrane system

Journal: International Conference on Industrial Engineering and Operations Management

Volume: 2nd African International Conference on Industrial Engineering and Operations Management, online Harare, Zimbabwe, December 8-10, 2020

Issue:

Page numbers of article: 300-315

ISSN: 2169-8767 (U.S. Library of Congress)

Author and co-authors: Sob, P.B.

Title: Optimising the velocity and discharge produced by a spray nozzle for efficient washing of aggregates in a mining industry

Journal: International Conference on Industrial Engineering and Operations Management

Volume: 2nd African International Conference on Industrial Engineering and Operations Management, online Harare, Zimbabwe, December 8-10, 2020

Issue:

Page numbers of article: 330-342

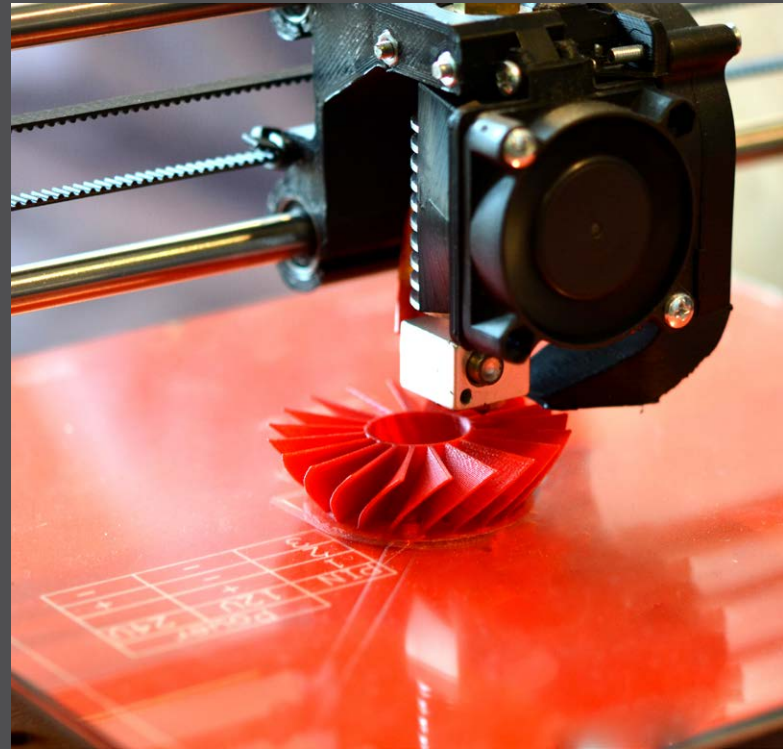
ISSN: 2169-8767 (U.S. Library of Congress)

Author and co-authors: Sob, P.B. & Pita, M.

Title: Designing and simulation a centrifugal pump shaft with enhanced mechanical properties during backpressure

Journal: International Conference on Industrial Engineering and Operations Management

Volume: 2nd African International Conference on Industrial Engineering and Operations Management, online Harare,



Zimbabwe, December 8-10, 2020

Issue:

Page numbers of article: 230-242

ISSN: 2169-8767 (U.S. Library of Congress)

Author and co-authors: Sob, P.B. & Pita, M.

Title: Simulating and optimising the stress distribution on a centrifugal pump shaft due to varying backpressure intensity

Journal: International Conference on Industrial Engineering and Operations Management

Volume: 2nd African International Conference on Industrial Engineering and Operations Management, online Harare, Zimbabwe, December 8-10, 2020

Issue:

Page numbers of article: 630-642

ISSN: 2169-8767 (U.S. Library of Congress)

Author and co-authors: Sob, P.B. & Pita, M.

Title: Experimental study on the performance of a vertical packing cooling tower at various flow rates

Journal: 2020 IEEE

Volume: 11th International Conference on Mechanical and Intelligent Manufacturing Technologies

Issue:

Page numbers of article: 80-92

ISBN: 978-1-7281-5331-5

Volume: 13, Number 12 (2020)

Issue:

Page numbers of article: 4276-4281

ISBN: 0974-3154

Author and co-authors: Letsapa, A.E., Sob, P.B., Alugongo, A.A. & Tengen, T.B.

Title: Characterising of pore size on asymmetric membrane for efficient and stable wettability during oil/water separation process

Journal: International Journal of Surface Engineering & Materials Technology

Volume: 9, No. 1, July-December 2020

Issue:

Page numbers of article: 4276-4281

ISSN: 2249-7250

Author and co-authors: Njokweni, E.L., Sob, P.B., Alugongo, A.A. & Tengen, T.B.

Title: Characterising of solute additives for thermal stability on nanocrystalline material produced by accumulative roll bonding

Journal: International Journal of Surface Engineering & Materials Technology

Volume: 9, No. 1, July-December 2020

Issue:

Page numbers of article: 4276-4281

ISSN: 2249-7250

Author and co-authors: Maome, T.G., Sob, P.B., Alugongo, A.A. & Tengen, T.B.

Title: Minimising cluster on ceramic membrane during nanoparticle coating by jet spray gun for efficient wettability during oil/water separation

Journal: International Journal of Surface Engineering & Materials Technology

Volume: 9, No. 1, July-December 2020

Issue:

Page numbers of article: 4276-4281

ISSN: 2249-7250

Author and co-authors: Mashimbye, N.C., Sob, P.B., Alugongo, A.A. & Tengen, T.B.

Title: Improving surface homogeneity in nanoparticle scattering during dip coating for stable and efficient wettability during oil/water separation

Journal: International Journal of Surface Engineering & Materials Technology

Volume: 9, No. 1, July-December 2020

Issue:

Page numbers of article: 4276-4281

ISSN: 2249-7250

Author and co-authors: Sob, P.B

Title: Modelling the effect of pressure waves and velocity of flow on membrane performance during oil-water separation
Journal: International Journal of Scientific and Technology Research

Volume: 13, Number 12 (2020)

Issue:

Page numbers of article: 4191-4198

ISSN: 2277-8616

Author and co-authors: Mashimbye, N.C., Sob, P.B., Alugongo, A.A. & Tengen, T.B.

Title: Improving surface homogeneity in nanoparticle scattering during dip coating for stable and efficient wettability during oil/water separation

Journal: International Journal of Surface Engineering & Materials Technology

Volume: 9, No. 1, July-December 2020

Issue:

Page numbers of article: 4276-4281

ISSN: 2249-7250

Author and co-authors: Sob, P.B

Title: Modelling the separability process of oil-water molecular motion for stable and efficient wettability process

Journal: International Journal of Scientific and Technology Research

Volume: 13, Number 12 (2020)

Issue:

Page numbers of article: 4211-4217

ISSN: 2277-8616

Author and co-authors: Sob, P.B

Title: Modelling the Impacts of Liquid Entry Pressure on Membrane Performance during Oil-Water Separation

Journal: International Journal of Scientific and Technology Research

Volume: 13, Number 12 (2020)

Issue:

Page numbers of article: 4163-4170

ISSN: 2277-8616

Author and co-authors: Sob, P.B

Title: Improving the mechanical efficiency of a pelton wheel impulse turbine at low head during operation

Journal: IJERT

Volume: 13, Number 7 (2020)

Issue:

Page numbers of article: 1508-1515

ISBN: 0974-3154

Author and co-authors: Sob, P.B

Title: Modelling and simulation of kinetic energy and its impact on the conservation of energy in an automotive hydraulic shock absorber during damping process

Journal: IJERT

Volume: 13, Number 7 (2020)

Issue:

Page numbers of article: 1575-1583

ISBN: 0974-3154

Author and co-authors: Sob, P.B

Title: Performance improvement of a centrifugal pump filtration system for industrial and domestic applications

Journal: IJERT

Volume: 13, Number 5 (2020)

Issue:

Page numbers of article: 942-966

ISBN: 0974-3154

Author and co-authors: Sob, P.B

Title: Strain rate effect of size variants and tensile behaviour of 6082T6 aluminium during deformation by accumulative roll bonding

Journal: IJERT

Volume: 13, Number 5 (2020)

Issue:

Page numbers of article: 542-566

ISBN: 0974-3154

Author and co-authors: Sob, P.B

Title: Enhancing nanocrystalline material yield strength during ARB process by using solute atoms as reinforcement

Journal: IJERT

Volume: 13, Number 9 (2020)

Issue:

Page numbers of article: 2519-2525

ISBN: 0974-3154

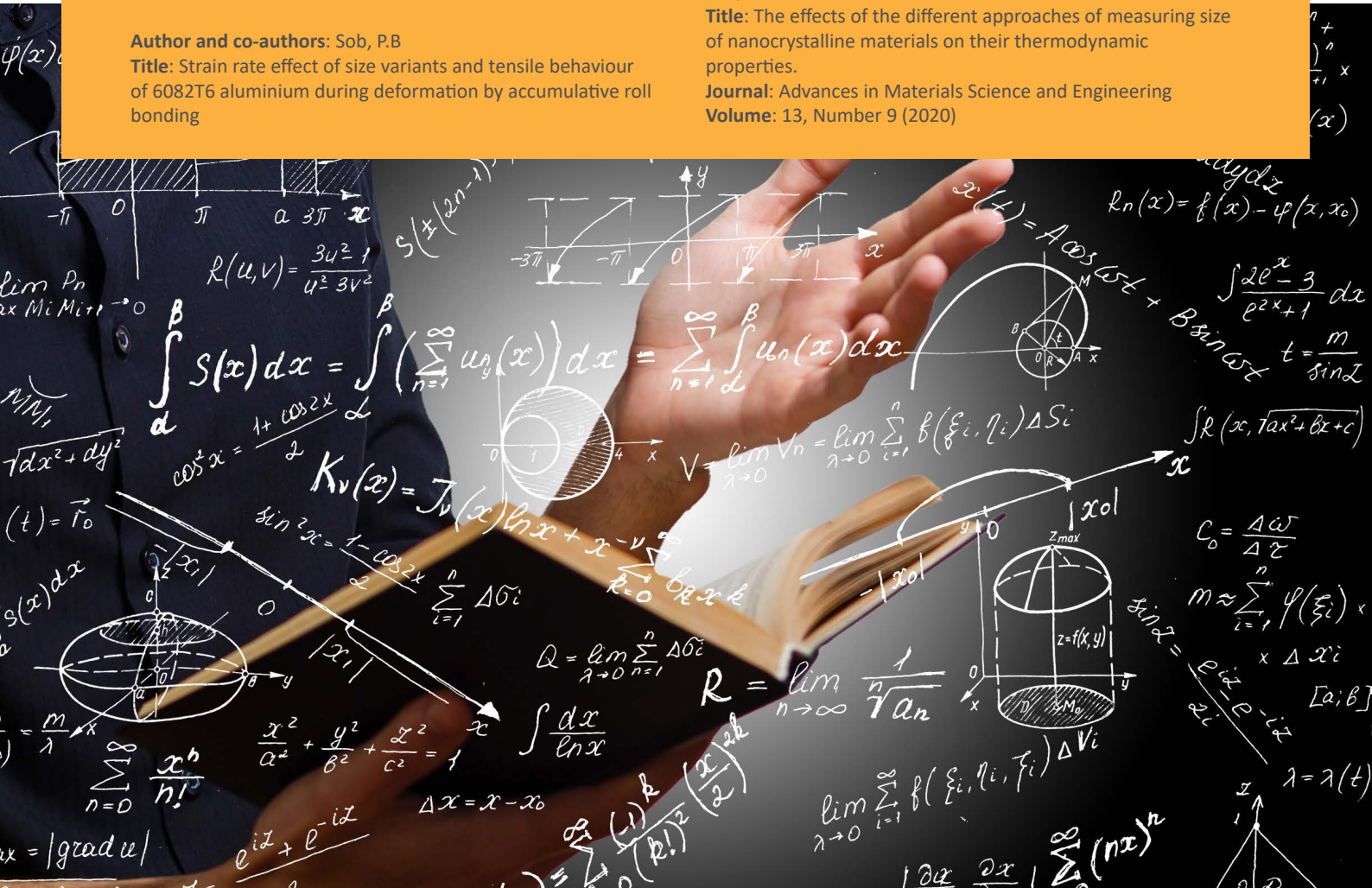
Author and co-authors (surname, initials, main author first):

Sob, P.B

Title: The effects of the different approaches of measuring size of nanocrystalline materials on their thermodynamic properties.

Journal: Advances in Materials Science and Engineering

Volume: 13, Number 9 (2020)



Issue:

Page numbers of article: 2505-2510

ISBN: 1687-8434

Author and co-authors: Sob, P.B

Title: Modelling the design of a centrifugal pump shaft that can withstand fatigue failure rate, stress and strain during backpressure

Journal: Advances in Materials Science and Engineering

Volume: 13, Number 10 (2020)

Issue:

Page numbers of article: 3017-3024

ISBN: 1687-8434

Author and co-authors: Sob, P.B

Title: Modelling and simulating stress distribution on a centrifugal pump shaft during backpressure

Journal: Advances in Materials Science and Engineering

Volume: 13, Number 10 (2020)

Issue:

Page numbers of article: 3037-3048

ISBN: 1687-8434

Author and co-authors: Alo, O. A. & Otunniyi, I. O.

Title: Graphite-filled polyethylene/epoxy blend for high-conductivity applications: the immiscibility edge

Journal: Polymer-Plastics Technology and Materials

Volume: 60

Issue: 1

Page numbers of article: 105-116

ISSN: URL: <https://doi.org/10.1080/25740881.2020.1793195>

Author and co-authors: Moja, G. M., Otunniyi, I. O., & Mendonidis, P.

Title: Thiol collector blends for improved PGM recovery: a case study of a UG2 ore

Journal: Journal of the Southern African Institute of Mining and Metallurgy

Volume: 120

Issue: June 2020

Page numbers of article: ???

ISSN: URL: <http://dx.doi.org/10.17159/2411-9717/179/2020>

Author and co-authors: Alo, O. A., Otunniyi, I. O. & Pienaar, H.C.vZ.

Title: Development of graphite-filled polymer blends for application in bipolar plates

Journal: Polymer Composites

Volume: 41

Issue: 8

Page numbers of article: 3364-3375

ISSN: URL: <https://doi.org/10.1002/pc.25625>

Author and co-authors: Oluokun, O. O. & Otunniyi, I. O.

Title: Kinetic analysis of Cu and Zn dissolution from printed circuit board physical processing dust under oxidative ammonia leaching

Journal: Hydrometallurgy

Volume: 193

Issue:

Page numbers of article: ????

ISSN: URL: <https://doi.org/10.1016/j.hydromet.2020.105320>

Author and co-authors: Malibongwe, M., Matibidi, K., Otunniyi, I.O., Thubakgale, C.K., Corin, K.C. & Wiese, J.G.

Title: Behaviour of mixtures of sodium iso-butyl xanthate and sodium di-ethyl dithiophosphate during the flotation of a Cu-Ni-Pt ore in degrading water quality

Journal: Minerals

Volume: 10

Issue:

Page numbers of article: 123 ????

ISSN: URL: <https://doi.org/10.3390/min10020123>

Author and co-authors: Oluokun, O. O. & Otunniyi, I. O.

Title: Chemical conditioning for wet magnetic separation of printed circuit board dust using octyl phenol ethoxylate

Journal: Separation and Purification Technology

Volume: 240

Issue:

Page numbers of article: ????

ISSN: URL: <https://doi.org/10.1016/j.seppur.2020.116586>

Author and co-authors: Manono, M. S., Matibidi, K., Otunniyi, I. O., Thubakgale, C. K., Corin K. C. & Wiese, J. G.

Title: The behaviour of mixtures of sodium iso-butyl xanthate and sodium di-ethyl dithiophosphate during the flotation of a Cu-Ni-Pt ore in degrading water quality

Journal: Minerals

Volume: 10

Issue: 2

Page numbers of article: 1-11

ISSN: 2075-163X

Author and co-authors: Cobbinah, P.V., Nzeukou, R.A., Onawale, O.T. & Matizamhuka, W.R.

Title: Laser powder bed fusion of potential superalloys: a review

Journal: Metals

Volume: 11

Issue: 1

Page numbers of article: 58

ISSN:

Author and co-authors: Mogale, N.F. & Matizamhuka, W.R.
Title: A study on the effect of ultrafine SiC additions on corrosion and wear performance of alumina-silicon carbide composite material produced by SPS sintering.

Journal: Metals

Volume: 10

Issue: 10

Page numbers of article: 1337

ISSN:

Author and co-authors: Mogale, N.F. & Matizamhuka, W.R.
Title: Spark plasma sintering of titanium aluminides: a progress review on processing, structure-property relations, alloy development and challenges

Journal: Metals

Volume: 10

Issue: 8

Page numbers of article: 1080

ISSN:

Author and co-authors: Mahundla, M.R., Matizamhuka, W.R., Yamamoto, A., Shongwe, M.B. & Machaka, R.

Title: Corrosion behaviour of Ti-34Nb-25Zr alloy fabricated by spark plasma sintering.

Journal: Journal of Bio-and Tribo-Corrosion

Volume: 6

Issue: 2

Page numbers of article: 01-09

ISSN:

Author and co-authors: Cobbinah, P.V., Matizamhuka, W., Machaka, R., Shongwe, M.B. & Yamabe-Mitarai, Y.

Title: The effect of Ta additions on the oxidation resistance of SPS-produced TiAl alloys

Journal: The International Journal of Advanced Manufacturing Technology

Volume: 106

Issue: 7

Page numbers of article: 3203-3215

ISSN:

Author and co-authors: Mathebula, C., Matizamhuka, W. & Bolokang, A.S.

Title: Effect of Nb content on phase transformation, microstructure of the sintered and heat-treated Ti (10-25) wt.% Nb alloys

Journal: The International Journal of Advanced Manufacturing Technology

Volume: 108

Issue:

Page numbers of article: 23-34

ISSN:

Author and co-authors: Rwanga, S. & Ndambuki, J.M.

Title: Solving groundwater problems fraught with uncertain recharge: an application to central Limpopo, South Africa

Journal: Journal of Groundwater for Sustainable Development

Volume: 10 (100305)

Issue: 10

Page numbers of article: 12

ISSN: 2352801X

Author and co-authors: Rwanga, S. & Ndambuki, J.M.

Title: Dataset of development of stochastic groundwater flow under uncertain recharge

Journal: MethodX Science Direct

Volume: 7 (2020) 100907

Issue:

Page numbers of article: 15

DOI of original article: 10.1016/j.gsd.2019.100305

Author and co-authors: Isabirye, A. K. & Orlando, M.

Title: Organisational justice: a matrix for ethics and integrity for improving construction productivity in South Africa

Journal: International Journal of Business and Management Studies

Volume: 12

Issue: 2

Page numbers of article: 340-355

ISSN: 1309-8047

Research in Progress

Researcher: Mdaka, N

Title: Electrochemical interaction of pentlandite and pyrrhotite with different thiol collectors

Field: Metallurgical Engineering; Froth Flotation Electrochemistry

Researcher: Khambule, K.P

Title: Alternatives for zinc recovery from basic oxygen furnace mud and grit

Field: Metallurgical Engineering; Extractive Metallurgy

Researcher: Bone, H

Title: Improving pentlandite concentrate quality by selective depression of pyrrhotite

Field: Metallurgical Engineering; Froth Flotation

Researcher: Lepule, M.L

Title: Computational modelling and heat treatment of titanium based alloys

Field: Material Science



Researcher: Baloyi, N.M

Title: Characterisation of Ti6Al4v Eli parts build via SLM for qualification

Field: Metallurgical Engineering, Physical Metallurgy

Researcher: Mwai, P

Title: Development of a platinum catalyst deposition technique for fabrication of fuel cell membrane electrode assemblies

Field: Electrochemistry

Researcher: Janse van Rensburg, N

Title: Development of a PV-H₂ generator power supply design platform with matlab/simulink

Field: Electronics

Researcher: Zungu, N

Title: Development of sulphated chitosan membrane modified with inorganic nano-fillers and organic materials for fuel cell applications.

Field: Electrochemistry

Researcher: Benson, M

Title: Constructing a multi-protocol supervisory control and data acquisition device for use in renewable energy systems.

Field: Computer Systems, Electronics

Researcher: Oluokun, O

Title: Selective recovery of base and precious metals from printed circuit boards physical processing dust

Field: Electrochemistry

New **MEng (Energy Efficiency)** students, with research proposals submitted:

Researcher: Maloka, T. V

Title: Optimising the tilt angles for PV modules in the Highveld region of South Africa in winter season

Field: Solar Systems

Researchers: Letebele, S. & Mbongo, J.

Title: Study of alternative energy technologies in comparison with the fossil fuel technologies in use within Sasol's plants in Sasolburg

Field: Alternative Energy

Researcher: Ramabulane, S

Title: Developing energy efficient power plant to increase capacity to the national grid

Field: Energy Efficiency

Researcher: Mahlangu, E. Z

Title: Cooling a photovoltaic surface to improve its performance.

Field: Solar Systems

Researcher: Ramolefo, E

Title: Energy optimisation and scheduling in office buildings using artificial neural network

Field: Energy Efficiency

Researcher: Duvenage E. E

Title: Calcium Hydroxide versus Ammonia for thermochemical energy storage

Field: Energy Efficiency

Researcher: Makgai, L, M

Title: Investigation of power system abnormalities using machine learning techniques

Field: Energy Efficiency

Researcher: Morwamotshe, P

Title: Investigating the impact of distributed generation (DG) on traditional protection in radial distribution systems

Field: Energy Efficiency

Research Partnerships/ Collaboration

Researchers: Lepule, M. L, Olubambi, P.A. & Wallace, W.

Title of research: Computational modelling and heat treatment of titanium based alloys

Higher Education Institution: University of Johannesburg and Vaal University of Technology

Industry: Education

Researcher: Dr Chalmier, J

Title of research: Fuel cell membrane assemblies

Higher Education Institution: University of Cape Town

Industry: Fuel Cells

Research Partnerships with International Universities/ Collaboration

Researcher: Prof Gruenwaldt, N

Title of research: PEESA III

Higher Education Institution: Hochschule Wismar, Germany





Researcher: Prof Pfaffenberger, K
Title of research: PEESA III
Higher Education Institution: Fachhochschule Flensburg,
Germany

Researcher: Prof Batog, J
Title of research: PEESA III
Higher Education Institution: University of Szczecin, Poland

Researchers: Prof Dumitrascu, D
Title of research: PEESA III
Higher Education Institution: University of Lucien Blaga, Sibiu,
Romania



FACULTY OF HUMAN SCIENCES

MESSAGE FROM THE EXECUTIVE DIRECTOR

PROF C.M. VAN DER BANK



The Faculty of Human Science is diverse and wide and ideal placed to conduct transdisciplinary research. As such the faculty seeks to position itself as a leader in research, teaching and community engagement in a transformed manner.

The Faculty of Human Sciences is diverse and wide and ideally placed to conduct transdisciplinary research. The Faculty seeks to position itself as a leader in research, teaching and community engagement in a transformed manner.

The demand for a responsive curriculum that produces competent graduates, leading entrepreneurs and innovators has seen the Faculty aligning its research response to various national, regional, and international agendas. These are the National Development Plan 2030, Agenda 2030 on Sustainable Development and Agenda 2063, also dubbed Africa We Want. The Faculty has thus shown a steady growth of Research Outputs over the years across its five departments.

The Researchers recorded a record of 26.04 output units during 2019 from journals, conferences and book chapters. The Department of Education, Legal Sciences and Hospitality, Tourism and PR Management recorded most outputs being more than five units per department. Unfortunately, 2020 saw a decline of outputs to 20.07, marking a drop of 5.97 units due to the devastating impact of the Covid-19 pandemic.

The COVID-19 pandemic affected several fieldwork activities and resulted in conference cancellations which adversely affected the final outputs. Although all the departments in the Faculty recorded a slump in outputs, there was a strong showing by the Department of Hospitality, Tourism and PR, which saw outputs shooting up from 5 units in 2019 to 8.33 in 2020.

The department was the only one to surpass the five units' mark. The Faculty also celebrated one of its staff members who obtained a National Research Foundation (NRF) rating at the end of 2020, becoming the first rated researcher from the Faculty and one of the 8 in the university.

The Faculty's future position looks solid, with many staff members having Masters and PhD qualifications. We believe that investment in postgraduate recruitment and supervision will boost future research outputs. As the Faculty grows, the hosting of post-Doctoral and other research fellows can leverage and catapult faculty research positions to greater heights. The staff members and students who were under challenging circumstances prepared to put in the time and contribute to the Faculty Research outputs has humbled the Faculty.

PROF C.M. VAN DER BANK



Postgraduate Staff Qualifications Completed in 2020

Name: Doman, J. A

Qualification: MTech: Photography

Dissertation/Thesis Title: A method to establish the sensitometric characterisation of a digital still & motion camera (DSMC)

University: Vaal University of Technology, Vanderbijlpark

Name: Nieman, C. M

Qualification: MA: Intercultural Communication

Dissertation Title: Tertiary education in a second language: A case study of the linguistic repertoires and experiences of multilingual students at a South African tertiary institution who previously had French as medium of instruction.

University: Stellenbosch University

Name: Nkosi M.S

Qualification: MA: English Studies

Dissertation Title: Teaching and learning poetry in a linguistically and culturally diverse context: A case study of FET classrooms in a township school

University: UNISA

Conferences (Papers and posters presented)

Presenter and co-presenter: Chmela-Jones, K. A. & Maharajh, R.

Title of Paper: Gradients of blended learning -lessons from the lockdown

Conference: HELTASA

Place: University of the Free State, Bloemfontein, South Africa (virtual)

Date: 30 November - 03 December 2020

Presenter: Chmela-Jones, K. A

Title of Paper: Exploring project-based learning in graphic design for the attainment of self-directed learning outcomes.

Conference: SSASEA, UNESCO conference

Place: North-West University, Potchefstroom, South Africa (virtual)

Date: 01 December -04 December 2020

Presenter: Maharajh, R

Title of Paper: Rasa and resilience: where to from here?

Conference: Rethinking Resilience

Place: Rhodes University, Makhanda, Grahamstown, South Africa (virtual)

Date: 05 October - 09 October 2020

Presenter and co-presenter: Makwela, M. J. & Mokhuhlane, O. R.

Title of Paper: The meaning of Africa-centred knowledge in visual arts: art educators and the making

Conference: SSASEA, UNESCO conference

Place: North-West University, Potchefstroom, South Africa (virtual)

Date: 01 December - 04 December 2020

Presenter and co-presenter: Mahlobo, R. K. & Lebelo, R. S.

Title of Paper: Impact of replacing supplementary examinations with second opportunity examinations in a South African University of Technology

Conference: 2020 International Conference on Multidisciplinary Research (MyRes)

Place: Bagatelle, Moka, Mauritius

Date: 14-15 December 2020

ISBN: 978-99949-0-615-4

ISSN: 1694-3597

Presenter: van der Bank, C. M

Title of Paper: The influence of climate change on sustainable tourism: an environmental threat

Conference: 13th Annual Conference of the EuroMed Academy of Business Theory and Practice Across Industries and Markets

Place: Online

Date: 09-10 September 2020

ISBN: 978-9963-711-89-5

ISSN: 2547-8516

Publications (Books/Chapters in Books)

Author and co-author: Dube, K. & Nhamo, G.

Chapter: Major global aircraft manufacturers and emerging responses to the SDGs Agenda

Title: Scaling up of SDGs

Publisher: Switzerland: Springer

Date: 2020

Page numbers of chapter: 99-113

ISBN/ISSN: 978-3-030-33216-7

Author and co-authors: Dube, K., Nhamo, G. & Mearns, K.

Chapter: &Beyond's response to the twin challenges of pollution and climate change in the context of SDGs

Title: Scaling up of SDGs

Publisher: Switzerland: Springer

Date: 2020

Page numbers of chapter: 87-98

ISBN/ISSN: 978-3-030-33216-7

Author and co-authors: Dube, K., Nhamo, G. & Chikodzi, D.
Chapter: Sustainable Development Goals: Concept and Challenges of Global Development Goal Setting
Title: Handbook of global health
Publisher: Springer, Cham
Date: 2020
Page numbers of chapter: 1-40
ISBN/ISSN: 978-3-030-05325-3

Author and co-authors: Dube, K., Nhamo, G. & Chikodzi, D.
Title: Counting the Cost of COVID-19 on the Global Tourism Industry
Publisher: Springer, Cham
Date: 2020

Page numbers of chapter: 1-418
ISBN/ISSN: 978-3-030-56231-1
Publications (Journals)

Author and co-authors: Adesanya, A. O., Egere, A. C., Ukaegbu, J. C. & Lebelo, R. S.
Title: Influence of temperature-dependent properties on a gravity-driven thin film along inclined plate
Journal: Nonlinear Engineering
Volume: 9
Issue: 1
Page numbers of article: 118-123
ISSN: 21928010



Author and co-authors: Akindeinde, S. O., Adesanya, S. O., Lebelo, R. S. & Moloi, K. C.
Title: A new multistage parker-sochacki method for solving the troesch's problem
Journal: International Journal of Engineering & Technology
Volume: 9
Issue: 2
Page numbers of article: 592-601
ISSN: 592-601

Author: de Klerk, A
Title: Photographer–camera–place relations: reflections on postphenomenology and landscape photography practice
Journal: Visual Studies
Volume: 35
Issue: 2-3
Page numbers of article: 201-215
ISBN/ISSN: Print ISSN: 1472-586X Online ISSN: 1472-5878

Author: Dube, K
Title: Tourism and sustainable development goals in the African context
Journal: International Journal of Economics and Finance Studies
Volume: 12
Issue: 1
Page numbers of article: 88-102
ISSN: 1309-8055

Author and co-author: Dube, K. & Nhamo, G.
Title: Vulnerability of nature-based tourism to climate variability and change: case of Kariba resort town, Zimbabwe
Journal: Journal of Outdoor Recreation and Tourism
Volume: 29
Page numbers of article: 1-13
ISSN: 2213-0780

Author and co-author: Dube, K. & Nhamo, G.
Title: Evidence and impact of climate change on South African national parks. Potential implications for tourism in the Kruger National Park
Journal: Environmental Development
Volume: 33
Issue:
Page numbers of article: 1-11
ISSN: 2211-4645

Author and co-author: Dube, K. & Nhamo, G.
Title: Sustainable development goals localisation in the tourism sector: lessons from Grootbos Private Nature Reserve, South Africa
Journal: GeoJournal
Volume:
Issue:
Page numbers of article: 1-18
ISSN: 0343-2521





Author and co-author: Dube, K. & Nhamo, G.

Title: Tourist perceptions and attitudes regarding the impacts of climate change on Victoria Falls

Journal: Bulletin of Geography. Socio-economic Series

Volume: 45

Issue: 45

Page numbers of article: 27-44

ISSN: 2083-8298

Author and co-author: Dube, K., Nhamo, G. & Chikodzi, D.

Title: Covid-19 cripples global restaurant and hospitality industry

Journal: Current Issues in Tourism

Issue: 1

Page numbers of article: 1-4

ISSN: 1747-7603

Author and co-author: Dube, K. & Nhamo, G.

Title: Greenhouse gas emissions and sustainability in Victoria Falls: focus on hotels, tour operators and related attractions

Journal: African Geographical Review

Page numbers of article: 1-17

ISSN: 2163-2642

Author and co-author: Dube, K. & Nhamo, G.

Title: Tourism business operators' perceptions, knowledge and attitudes towards climate change at Victoria Falls

Journal: The Journal for Transdisciplinary Research in Southern Africa

Volume: 16

Issue: 1

Page numbers of article: 1-10

ISSN: 0145-2134

Author and co-authors: Fouche, A., Fouche, D. F. & Theron, L. C.

Title: Child protection and resilience in the face of Covid-19 in South Africa: A rapid review of C-19 legislation

Journal: Child Abuse & Neglect

Volume: 16

Issue: 1

Page numbers of article: 1-10

ISSN: 0145-2134

Author and co-authors: Fouche, A., Truter, E. & Fouche, D. F.

Title: Safeguarding children in South African townships against child sexual abuse: the voices of our children

Journal: Child abuse review

Volume: 28

Issue: 6

Page numbers of article: 455-472

ISSN: 1099-0852

Author and co-author: Khashane, R. & Lekaota, L.

Title: Perceptions of local communities on the benefits of

tourism in the protected areas

Journal: African Journal of Hospitality, Tourism and Leisure

Volume: 9

Issue: 1

Page numbers of article: 1-14

ISBN/ISSN: 2223-814X

Author and co-author: Kruger, S. & Venter, D.

Title: I can't buy happiness but could own a motorcycle: does leisure life matter?

Journal: African Journal of Hospitality, Tourism and Leisure

Volume: 9

Issue: 4

Page numbers of article: 469-483

ISSN: 2223-814X

Author: Lebelo, R. S

Title: On heat transfer of a two-step radiating slab of variable thermal conductivity

Journal: Materials Science Forum

Volume: 987

Issue: 1

Page numbers of article: 137-141

ISBN/ISSN: 1662-3752

Author and co-authors: Lebelo, R. S., Moloi, K. C. & Jaffer, S.

Title: Corona virus pandemic and change to online learning in one South African private higher education institution: an action research

Journal: Loyola Journal of Social Sciences

Volume: 34

Issue: 2

Page numbers of article: 51-74

ISBN/ISSN: 0971-4960

Author: Lenz, R.

Title: Foregrounding Boundaries Between Self and Other in South Africa: A Comparative Analysis of The Lostness of Alice, The Good Doctor and Lost Ground

Journal: Journal of Literary Studies

Volume: 36

Issue: 2

Page numbers of article: 1-17

ISSN: 256-4718

Author and co-author: Lenz, R. & Moloi, K. C.

Title: Finding identity and meaning in the face of despair: Athol Fugard's statements after an arrest under the immorality act

Journal: South African Theatre Journal

Volume: 32

Issue: 2

Page numbers of article: 108-122

ISSN: 1013-7548

Author and co-authors: Mazibuko, M. & Lloyd, T.

Title: Prevalence of teenage pregnancy in schools: an ecosystemic approach

Journal: Transylvanian Review

Volume: 27

Issue: 50

Page numbers of article: 15136-15146

ISSN: 1221-1249

Author and co-authors: Mokwena, R. J., Motseki, M. M. &

Dube, N. C.

Title: Evaluating the role of criminal investigators during bail application

Journal: International Journal of Social Sciences and Humanity Studies

Volume: 12

Issue: 1

Page numbers of article: 161-174

ISSN: 1309-8063

Author and co-author: Motseki, M. & Mofokeng, J. T.

Title: stakeholders as catalyst to human trafficking: a case study of three selected areas of Gauteng province, South Africa

Journal: Cogent Social Sciences

Volume: 6

Issue: 1

Page numbers of article: 1-14

ISSN: 23311886

Author and co-author: Motseki, M. & Mofokeng, J. T.

Title: The effects of human trafficking on victims: a case study of three areas in the Gauteng province, South Africa

Journal: International Journal of Social Sciences and Humanity Studies

Volume: 12

Issue: 2

Page numbers of article: 513-528

ISSN: 1309-8063

Author: Motseki, M

Title: Understanding policing of human trafficking in Gauteng province, South Africa: the phenomena, challenges and effective responses

Journal: International Journal of Criminology and Sociology

Volume: 9

Issue: 2

Page numbers of article: 1312-1321

ISSN: 1929-4409/20

Author and co-authors: Motseki, M., Maluleke, W. & Dlamini, S.
Title: Military role in democratic transition and succession: lessons from the Kingdom of Lesotho
Journal: Cogent Social Sciences
Volume: 6
Issue: 1
Page numbers of article: 1-17
ISSN: 23311886

Author and co-authors: Olaniyi, S., Okosun, K. O., Adesanya, S. O. & Lebelo, R. S.
Title: Modelling malaria dynamics with partial immunity and protected travellers: optimal control and cost-effectiveness analysis

Journal: Journal of Biology Dynamics
Volume: Online
Page numbers of article: 1-6
ISSN: 1607-0658

Author and co-authors: Otitoola, O., Oldewage-Theron, W. & Egal, A. A.
Title: Prevalence of overweight and obesity among selected schoolchildren and adolescents in Cofimvaba, South Africa
Journal: South African Journal of Clinical Nutrition
Volume: 14
Issue: 1
Page numbers of article: 90-115
ISSN: 21928010



Author and co-authors: Oldewage-Theron, W., Morales, S. & Egal, A. A.

Title: Change in soy and nutrition knowledge and perceptions of smallholder South African farmers after attending a single one day soy nutrition training workshop: a pilot study

Journal: African Journal of Food, Agriculture, Nutrition & Development

Volume: 2

Issue: 6

Page numbers of article: 16604-16621

ISSN: 1684-5374

Author and co-author: Senekal, Q. & Lenz, R.

Title: Decolonising the South African Higher Education Curriculum: An Investigation into the challenges

Journal: International Journal of Social Sciences and Humanity Studies

Volume: 12

Issue: 1

Page numbers of article: 146-160

ISSN: 1309-8063

Author and co-author: Senekal, Q. & Lenz, R.

Title: Transformational leadership: enabling others to act
Journal: International Journal of Business and Management Studies

Volume: 12

Issue: 2

Page numbers of article: 532-543

ISSN: 1309-8047

Author and co-author: van der Bank, M. & Karsten, J.

Title: Climate change and South Africa: A critical analysis of the earthlife earth-life Africa Johannesburg and another v Minister of Energy and others 65662/16 (2017) case and the drive for concrete climate practices

Journal: Air, Soil and Water Research

Volume: 13

Page numbers of article: 1-11

ISSN: 11786221

Author: Venter, D

Title: Angolan battlefield tourism: Impact on the quality of life of South African Defence Force (SADF) veterans

Journal: Journal of Psychology in Africa

Volume: 30

Issue: 5

Page numbers of article: 451-458

ISSN: 1433-0237





Research in Progress

Researcher: Cilliers, C. D

Title: A Critical assessment of marine wildlife voluntourism in Southern Africa

Field: PhD: Tourism Management

Researcher: Makwela, M. J

Title: Reclaiming liberation struggle memories in a post-apartheid South Africa in the Sedibeng District Municipality through short animated films

Field: D Phil: Visual Arts

Researcher: Erasmus, V

Title: Impact measurement of a nutrition education programme on knowledge retention and dietary intake behaviour on primary school children in Gauteng

Field: D Tech: Food Service Management

Researcher: Erasmus, T

Title: A comparison of place attachment as a cultural ecosystem service in South African National Parks: an adaptive management strategy

Field: PhD: Environmental Management

Researcher: Thwala, K. C

Title: A critical review of the application of marketing mediums in the accommodation sector: An SME perspective

Field: PhD: Tourism Management

Researcher: Maharajh, R

Title: Seeming, being, becoming: an intimate, rasa-led performance art exploration

Field: PhD: Visual Arts

Researcher: Mosebi, L. J

Title: The teaching of English poetry in selected schools in Gauteng

Field: Comparative Education

Researcher: van der Walt, D

Title: Personalising the elements and principles of graphic design: an exploratory autoethnographic case study

Field: MTech: Graphic Design

Researcher: Radebe, M. L

Title: Symbolism in sangoma cloth: A South African printmaking journey from the liminal to the liminoid

Field: MTech: Fine Art

Researcher: Ismail, F. in progress

Field: BA Honours: Integrated Organisational Communication



E-LEARNING



FACULTY OF MANAGEMENT SCIENCES

MESSAGE FROM THE EXECUTIVE DIRECTOR

PROF M. DHURUP



Within the area of Research, some of these challenges included, among other things, the inability to meet in person with postgraduate students, cancellation of most academic conferences and emotional instability as staff and students were agitated by the effects of the pandemic.

The emergence of the Covid-19 pandemic brought numerous extraordinary challenges to the Faculty of Management Sciences (FMS). Within the area of Research, some of these challenges included, among other things, the inability to meet in person with postgraduate students, cancellation of most academic conferences and emotional instability as staff and students were agitated by the effects of the pandemic. There were also difficulties in collecting research data, a decline in academic collaborations and the postponement/cancellation of Research Development initiatives such as workshops and symposia.

The Faculty had to adopt a paradigm shift to address these challenges and become innovative in how research staff conduct their business. The enhanced adoption of various online systems and platforms as the primary communication media for driving Research was a profound innovation. The Faculty of Management Sciences applaud their members for the untiring efforts to drive Research within the four departments (Marketing, Logistics and Supply Chain Management, Accountancy & Human Resources Management). They put all the effort into research to achieve the Strategic Research goals of the University as documented in the current VUT Strategic Plan (2020-2025). The Faculty saw significant contributions made in all disciplines towards research outputs in accredited articles, conference proceedings and postgraduate Masters and Doctoral qualifications.

As acting Faculty Research professor, we must applaud Prof Mokoena as he steered the Faculty to achieve the expected Research outputs. A concerted effort between Prof Mokoena, Heads of Departments and my office provided strategic direction for coordinating various research activities within the Faculty. The research trajectory of the FMS showed a steady growth in the registered number of Masters and Doctoral students (Masters 146; Doctoral 41). A total of 12 Masters and three Doctoral qualifications were awarded in 2020. Staff members in the FMS were also provided with support to complete their Master and Doctoral qualifications. Amid the Covid-19 regulations and protocols, the Faculty made 14 virtual presentations at conferences and published 31.74 units in accredited journals. Staff members also participated in the external review of articles, books and related research. However, a key challenge faced by postgraduate students was the execution of their Research fieldwork in industries, businesses and local communities due to the Covid-19 restrictions.

The University recognised various staff members for their research efforts. Dr F Mahomed was placed first in the Faculty and third in the University in the Research Achievement category. Dr Chinomona was ranked second in the Faculty and third in the University in the Research Excellence category. Prof M Dhurup

was placed first in the Faculty and second in the University in the Research Excellence category.

Due to the Covid-19 restrictions, only one face-to-face induction session was conducted to strengthen research support for the postgraduate students in the Faculty. However, postgraduate supervision and guidance continued via online applications and MS teams due to emergency remote teaching (ERT).

Further, the Faculty's Research area is honed on addressing institutional, local, provincial, and national research and innovation priorities. Research focus area projects were encouraged to be interdisciplinary with researchers and students from the departments within the Faculty and the institution combining their expertise to solve complex research problems. The research and innovation focus areas are essential to promote a sustainable research and innovation culture by building onto academic staff's current capacity and capabilities within the Faculty. To this end, the Faculty encourages research efforts in communities, municipalities, small enterprises and state-owned enterprises (SOEs).

Even though the Faculty has made great strides in research, much still has to be accomplished. A new Strategic Plan is being developed for the next phase, calling for more activities to enrich staff and students' research journeys and experiences and conduct breakthrough research. New innovative postgraduate programmes introduced in the Faculty may facilitate this breakthrough. This may change the Faculty's Research "DNA" as all stakeholders reflect on the current socio-economic changes. The Faculty will continue to provide the research space and support to all of its staff and students. Further, the support of research grants and other funding provided by the Research Directorate to all staff and students in the FMS is acknowledged.

As efforts to charter a way forward to develop a rich ecosystem of Researchers in the Faculty continue, a dire need exists for more Professors and Associate Professors within the Faculty to drive research and undertake postgraduate supervision and co-supervision duties. We are hopeful that this void will be filled in the coming years.

PROF. M. DHURUP

Postgraduate Staff and Students Qualifications Completed in 2020

Name: Ekujumi, T.M

Qualification: MTech: Human Resource Management

Dissertation/Thesis Title: The relationship between perceived organizational support, frustration with work and occupational commitment among public secondary school educators in the Sedibeng West District

University/Institution: Vaal University of Technology

Name: Mahlatsi, M

Qualification: MTech: Logistics

Dissertation/Thesis Title: Green supply chain management practices, environmental performance and supply chain performance in the beverage industry of South Africa

University/Institution: Vaal University of Technology

Name: Masitenyane, L.A

Qualification: DTech: Marketing

Dissertation/Thesis Title: Dimension and outcomes of buyer-seller relationship intentions for concrete products in the construction environment

University/Institution: Vaal University of Technology

Name: Mosai, K

Qualification: MTech: Logistics

Dissertation/Thesis Title: Perceptions of motorists towards e-tolls in Gauteng province: South Africa.

University/Institution: Vaal University of Technology

Name: Mba, E.A

Qualification: MTech: Logistics

Dissertation/Thesis Title: Influence of supply chain collaborations and information sharing on the performance of



Name: Makhubela, V

Qualification: MTech: Marketing

Dissertation/Thesis Title: The influence of selected consumer-based brand equity elements on brand preference and purchase intention towards store brands

University/Institution: Vaal University of Technology

Name: Maphanga, M.E

Qualification: MTech: Business Administration

Dissertation/Thesis Title: Leadership power bases' influences on quality of work-life and intention to stray among employees at a selected retail outlet

University/Institution: Vaal University of Technology

small to medium enterprises in a district municipality.

University/Institution: Vaal University of Technology

Name: Lt Mutekwe, A

Qualification: MTech: Logistics

Dissertation/Thesis Title: A model for supply chain risk management and operational performance in the food retail industry in Zimbabwe

University/Institution: Vaal University of Technology

Name: Mothibi, G

Qualification: PhD: Business Administration

Dissertation/Thesis Title: A framework for the implementation of e-procurement procurement practices in the South African public sector

University/Institution: Vaal University of Technology

Name: Nkumane, M.R

Qualification: MTech: Human Resource Management

Dissertation/Thesis Title: The influence of organizational commitment and job satisfaction on employee corporate social responsibility participation in a financial institution in Gauteng

University/Institution: Vaal University of Technology

Name: Ngonkem-Ngobena, N

Qualification: MTech: Business Administration

Dissertation/Thesis Title: Business growth challenges and opportunities for small and medium enterprises in the Sedibeng region

University/Institution: Vaal University of Technology

Name: Nwele, K

Qualification: MTech: Logistics

Dissertation/Theses Title: Factors influencing buyer-supplier commitment and competitive performance among small and medium enterprises in the Southern Gauteng

University/Institution: Vaal University of Technology

Name: Phillips, M

Qualification: PhD: Business Administration

Dissertation/Thesis Title: The relationship between human resource management practices, corporate entrepreneurship and business performance in medium and large business in Gauteng province

University/Institution: Vaal University of Technology

Name: Seeku, V

Qualification: MTech: Logistics

Dissertation/Thesis Title: Reverse logistics practices and business performance in manufacturing firms in the Vaal Triangle

University/Institution: Vaal University of Technology

Conferences (Papers and posters presented)

Presenter & co-presenter: Chinomona, E. & Mangoapegne Ngouapengne, C.N.

Title of Paper: Content analysis study: An investigation of the impact of green supply chain practices on green performance: Case of Gauteng province

Conference: ICSS

Place: North-West University

Date: 02-04 September 2020

Presenter & co-presenter: Chinomona, E & Mangoapegne

Ngouapengne, C.N.

Title of Paper: An investigation of the impact of green supply chain practices on green performance: Case of Gauteng province

Conference: 11th Global Conference on Business and Social Sciences, Bangkok Thailand

Place: Virtual Conference

Date: 11-12 December 2020

Presenter & co-presenter: Chinomona, E. & Bikissa-Macongue, M.B.

Title of Paper: The impact of student motivation, satisfaction and loyalty on student performance in Universities

Conference: 11th Global Conference on Business and Social Sciences, Bangkok Thailand

Place: Virtual Conference

Date: 11-12 December 2020

Presenter: Dunga, H

Title of Paper: An analysis of household food security: A case of townships in Gauteng South Africa

Conference: ICSS

Place: North-West University

Date: 02-04 September 2020

Presenter: Isabirye, A

Title of Paper: Organisational justice: A matrix for ethics and integrity for organisational justice: A matrix for ethics and integrity for improving construction productivity in South Africa

Conference: ICSS

Place: North-West University

Date: 02-04 September 2020

Presenter & co-presenter: Mahao, B. & Dlodlo, N.

Title of Paper: The green-consumption decision-making styles of undergraduate students towards the purchase of digital books

Conference: ICSS

Place: North-West University

Date: 02-04 September 2020

Presenter & co-presenter: Masitenyane, L.A. & Mokoena, B.A.

Title of Paper: Relationship intentions, relationship quality and commitment in a business-to-business concrete product environment

Conference: ICSS

Place: North-West University

Date: 02-04 September 2020

Presenter & co-presenters: Matsheke, M., van der Merwe, S.P. & Mafini, C.

Title of Paper: Utilisation of information sources by prospective student entrepreneurs to screen business opportunities

Conference: ICSS
Place: North-West University
Date: 02-04 September 2020

Presenter & co-presenter: Matsheke, O.T. & Dhurup, M.
Title of Paper: Examining the readiness of students towards becoming entrepreneurs
Conference: ICSS
Place: North-West University
Date: 02-04 September 2020

Presenter: Sharp, K.L
Title of Paper: Evaluating the effectiveness of customer experience management at Transnet freight rail in Gauteng
Conference: ICSS
Place: North-West University
Date: 02-04 September 2020

Presenter & co-presenters: Mokoena, B.A., Mafini, C. & Dhurup, M.
Title of Paper: The influence of market orientation barriers on University performance: A developing country perspective
Conference: ICSS
Place: North-West University
Date: 02-04 September 2020

Presenter & co-presenter: Sharp, K.L. & Govender, C.N.
Title of Paper: An investigation into the effectiveness of the customer relationship management information system of IBM South Africa
Conference: ICSS
Place: North-West University
Date: 02-04 September 2020

Presenter: van der Westhuizen, J.P
Title of Paper: Evaluation of the perceived leadership practice of postgraduate students at a University of Technology
Conference: ICSS
Place: North-West University
Date: 02-04 September 2020

Presenter: Sharp, K.L
Title of Paper: Students' attitudes towards the use of a virtual learning environment with the presence of advertisement at a South African University of Technology pilot study results
Conference: 11th Global Conference on Business and Social Sciences, Bangkok Thailand
Place: Virtual Conference
Date: 11-12 December 2020

Induction sessions

Name: Dhurup, M
Title: Research orientation
Presented to: Postgraduate Students
Place: Library training room, Vaal University of Technology
Date: 07 March 2020

Publications (Book/Chapters in Books)

Author and co-authors: Isabirye, A, Dlodlo, N. & Mbatl, L.
Chapter: Impediments to the use of e-learning technology in applied sciences and technology at a University in South Africa
Title: In trends –e-business-government
Publisher: EFE Academy; Istanbul (Turkey)
Date:
Page numbers of chapter: 57-70 (2020) Pg. 59
ISBN: 978-625-7729-46-8.
O. Eydin (Editor). ISBN: 978-625-7729-47-5 eBook:

Publications (Journals)

Author and co-authors: Chilimba, T., Dunga, H. & Mafini, C.
Title: The impact of microfinance programme participation on household food security in Malawi
Journal: International Journal of Economics and Financial Studies
Volume: 12
Issue: 1
Page numbers of article: 204-222
ISSN: 1309-2019

Author and co-author: Chinomona, E. & Khotso, M.
Title: Motorists attitudes towards Implementation of e-tolls in Gauteng Province, South Africa
Journal: International Journal of eBusiness and eGovernment Study
Volume: 12
Issue: 1
Page numbers of article: 48-62
ISSN: 2146-0744

Author and co-authors: Chinomona, E., Poopola, B.A. & Poopola, O.O.
Title: The influence of entrepreneurial training, access to finance, entrepreneurial capacity, entrepreneurial atmosphere on youth entrepreneurship
Journal: African Journal of Business and Economic Research
Volume: 15
Issue: 1
Page numbers of article: 83-109
ISSN: 1750-4562

Author: Chinomona, E
Title: Use of corporate entrepreneurship to gain competitive advantage in a small manufacturing company: A development economics
Journal: Acta Commercill
Volume: 5
Issue:1
Page numbers of article: 1-10
ISSN: 2518-4855

Author and co-authors: Chinomona, E., Mutekwe, L.T. & Mafini, C.
Title: Supply chain risk management and operation performance in the food retail industry in Zimbabwe
Journal: Acta commercill
Volume: 17
Issue:2
Page numbers of article: 1-15
ISSN: 1684-1999

Author and co-author: Chinomona, E. & Magoukou-Ngoupegne, C.N.
Title: Organic food: A case of Gauteng in South Africa
Journal: The Retail and Marketing Review
Volume: 16
Issue: 21
Page numbers of article: 1-10
ISSN: 1817-4428

Author and co-author: Dlodlo, N. & Mahao, B.B.
Title: The influence of demographics on the online purchase decision-making styles of undergraduate students
Journal: International Journal of Business and Management Studies
Volume: 12
Issue: 2
Page numbers of article: 486-500
ISSN: 1309-8047

Author: Dunga, H.M
Title: An empirical analysis on determinations of food security among female-headed households in South Africa
Journal: International Journal of Social Sciences and Humanity Studies
Volume: 12
Issue: 2
Page numbers of article: 66-81
ISSN: 1309-8063

Author and co-author: Dunga, H.M. & Dunga, S.H.
Title: An analysis of household food security: A case study of townships in Gauteng South Africa



Journal: International Journal of Economics and Finance Studies
Volume: 12
Issue: 2
Page numbers of article: 388-405
ISSN: 1309-8055

Author and co-authors: Dunga, H.M., Mafini, C. & Chilimba, T.
Title: The impact of microfinance programme participation on household food security in Malawi
Journal: International Journal of Economics and Finance Studies
Volume: 12
Issue: 1
Page numbers of article: 204-222
ISSN: 1309-8055

Author and co-author: Dunga, H.M. & Moyo, D.
Title: The introduction of higher banknotes and inflation in Malawi: A case of bi-causality
Journal: African Journal of Business and Economics Research
Volume: 15
Issue: 1
Page numbers of article: 137-163
ISSN: 1750-454



Author and co-authors: Dhurup, M., Surujlal, J. & Kot, S.
Title: Retirement planning: comparison between Polish and South Africa professional soccer player
Journal: Economics and Sociology
Volume: 13
Issue: 2
Page numbers of article: 100-109
ISSN: 2071-789X

Author and co-authors: Dhurup, M., Jonck, P. & Surujlal, J.
Title: Perceptions of and satisfaction with video assistance refereeing in soccer
Volume: 14
Issue: 9
Page numbers of article: 677-691
ISSN: 2201-1323

Author and co-author: Govender, C.N. & Sharp, K.
Title: An investigation into the use of the customer relationship a management tooling system of IBM South Africa
Journal: International Journal of Business and Management Studies
Volume: 12
Issue: 2
Page numbers of article: 1309-8047
ISSN: 1309-8055

Author and co-author: Isabirey, A. & Orlando, M.
Title: Organisational justice: a matrix for ethics and integrity for improving construction productivity in South Africa
Journal: International Journal of Business and Management Studies
Volume: 12
Issue: 2
Page numbers of article: 340
ISSN: 1309-8047

Author and co-authors: Johnathan, E., Mafini, C. & Badhury, J.
Title: Supply chain risk mitigation in South Africa: a case study of Eskom
Journal: Benchmarking: An International Journal
Volume: 27
Issue: 3
Page numbers of article: 1105-1125
ISSN: 1463-5771

Author and co-author: Janse van Rensburg, C. & Rothmann, S.
Title: Towards positive institutions and positive practices and employees' experiences in higher education institutions
Journal: South African Journal of Industrial Psychology
Volume: 46
Issue: 0
Page numbers of article: 1-11
ISSN: 2071-0763

Author and co-author: Kok, L. & Mojapelo, T.J.
Title: Exploring trade union relevance amongst University of Technology youth employees in South Africa
Journal: Exploring trade Union Relevance amongst University of Technology youth Employees in South Africa
Volume: 12
Issue: 2
Page numbers of article: 466
ISSN: 1309-8063

Author: Kok, L
Title: Relationship between skills development, development, employee motivation and organisational performance in South African organisations
Journal: International Journal of Business and Management Studies
Volume: 12
Issue: 1
Page numbers of article: 163-175
ISSN: 1309-8047

Author and co-authors: Loury-Okuomba, W.V., Mafini, C. & Bhadury, J.
Title: Supply chain risk management and organizational performance: evidence from SME's in South Africa
Journal: Africa Journal of Management
Volume: 6
Issue: 4
Page numbers of article: 295-326
ISSN: 2332-2373

Author and co-authors: Madzimore, J., Mafini, C. & Dhurup, M.
Title: E-procurement, supplier integration, and supply chain performance in small and medium enterprises in South Africa
Journal: South African Journal of Business Management
Volume: 51
Issue: 1
Page numbers of article: 1-12
ISSN: 2078-5976

Author and co-author: Madamombe-Gomera, P.M. & Mafini, C.
Title: Supply chain management enablers, barriers and disruptions in the animal feed industry in the Western Cape province of South Africa
Journal: Journal of Transport and Supply Chain Management
Volume: 14
Issue: 0
Page numbers of article: 1-12
ISSN: 1995-5235

Author and co-author: Mahlatsi, M.K. & Chinomona, E.
Title: Green supply chain practices and supply chain

performance in the packaging industry of South Africa
Journal: Journal of Contemporary Management
Volume: 17
Issue: 2
Page numbers of article: 295-325
ISSN: 1815-7445

Author and co-authors: Masitenyana, L.A., Dhurup, M., Mokoena, B.A. & Muposhi, A.
Title: Antecedents of relationship intentions in SA construction industry B2B environments: A factor analytical structure.
Journal: International Journal of Business and Management Studies (IJBMS)
Volume: 12
Issue: 1
Page numbers of article: 147-162
ISSN: 1309-8047 (Online) Open

Author and co-author: Masitenyane, L.A. & Mokoena, B.A.
Title: Antecedents of relationship marketing in a business-to-business concrete product environment
Journal: International Journal of Business and Management-to-Business Concrete Production Environment
Volume: 12
Issue: 2
Page numbers of article: 454-469
ISSN: 1309-8047

Author and co-author: Masitenyane, L.A. & Dhurup, M.
Title: Antecedents of relationship intentions and its association with supplier's relationship quality in a business-to-business environment
Journal: International Journal of Innovative Technology and Exploring Engineering
Volume: 29
Issue: 2
Page numbers of article: 175-192
ISSN: 2005-4238

Author and co-authors: Masitenyane, L., Dhurup, M., Muposhi, A. & Mokoena, B.A.
Title: Antecedents of relationship intentions in business-to-business environments: a factor analytical approach
Journal: International Journal of Business and Management Studies
Volume: 12
Issue: 1
Page numbers of article: 147-162
ISSN: 1309-8047

Author and co-author: Matthews, M. & Mokoena, B.A.
Title: The influence of service quality dimensions on customer satisfaction within visa facilitation centres in South Africa
Journal: International Journal of e-Business and e-Government Studies
Volume: 12
Issue: 2
Page numbers of article: 112-125
ISSN: 2146-0744

Author and co-author: Mazibuko, M. & Dlodlo, N.
Title: The influence of informational heuristics in determining the evaluation of microblog music review credibility
Journal: International Journal of Social science and Humanity Studies
Volume: 12
Issue: 2
Page numbers of article: 82-97
ISSN: 1309-8063

Author and co-authors: Mokoena, B.A., Mafini, C. & Dhurup, M.
Title: The Influence of market orientation barriers on University performance: A developing country perspective
Journal: International Journal of Business and Management Studies
Volume: 12
Issue: 2
Page numbers of article: 356-370
ISSN: 1309-8047

Author and co-authors: Mutekwe, L.T., Mafini, C. & Chinomona, E.
Title: Supply chain risk management and operational performance in the food retail industry in Zimbabwe
Journal: Acta Commercii
Volume: 20
Issue: 1
Page numbers of article: 1-15
ISSN: 1684-1999

Author and co-author: Mosala, K. & Chinomona, E.
Title: Motorists attitudes towards implementation of e-toll in Gauteng province, South Africa.
Journal: International Journal of e-Business and e-Government Studies
Volume: 12
Issue: 1
Page numbers of article: 48-62
ISSN: 2146-0744

Author and co-authors: Ngo Ndjama, J.D., Dhurup, M. & Joubert, P.A.
Title: Exploring the relationship between organization

identification and organizational citizenship behaviour among employees in a University of Technology in South Africa
Journal: International Journal of e-Business and Management Studies
Volume: 12
Issue: 1
Page numbers of article: 84-100
ISSN: 1309-8047

Author and co-author: Ngo Ndjama, J.D. & Joubert, P.A.
Title: Organisational identification among academics in a high education institution in South Africa: Effects of age, work experience and job grade levels
Journal: International Journal of Social Sciences and Humanity Studies
Volume: 12
Issue: 2
Page numbers of article: 433
ISSN: 1309-8063

Author and co-author: Omoruyi, O. & Mba, E.A.
Title: The influence of supply chain management on the performance of small to medium enterprises in Southern Gauteng
Journal: International Journal of Economics and Finance Studies
Volume: 12
Issue: 1
Page numbers of article: 172-188
ISSN: 1309-8055

Author: Omoruyi, O
Title: Logistics objectives, capability and benefits: The case of SMEs in Emfuleni municipal district
Volume: 12
Issue: 2
Page numbers of article: 289
ISSN: 1309-8047

Author and co-author: Omoruri, O. & Nwele, U.K.
Title: Influence buyer-supplier commitment and competitive performance among small and medium enterprises in Southern Gauteng
Volume: 12
Issue: 2
Page numbers of article: 501
ISSN: 1309-8047

Author and co-author: van der Westhuizen, J. & Ntshingila, L.
Title: The effect of supplier selection, supplier development and information sharing on SME's business performance in Sedibeng

Journal: International Journal of Economics and Finance Studies
Volume: 12
Issue: 2
Page numbers of article: 290-304
ISSN: 1309-8055

Research in Progress

Researcher: Cassim R,
Title: Development and validation of bankruptcy prediction indicators of JSE listed companies
Field: PhD: Accountancy

Researcher: Khumalo, R
Title: A qualitative study of tax compliance among cryptocurrency users in South Africa
Field: PhD: Accountancy

Researcher: Magapa , T.J
Title: Online permission-based marketing practices and their impact in customer acquisition and retention
Field: PhD: Marketing Management

Researcher: Mofokeng, T.M
Title: The impact of green practices on supply chain performance in the textile and clothing industry
Field: Supply chain management (PhD to be completed)

Researcher: Matsheke, M.J
Title: A comparative study of entrepreneurship education and entrepreneurial intentions amongst students at selected South African institutions of higher education
Field: PhD: Business Admin

Researcher: Matsheke, O.T
Title: The influence of entrepreneurial alertness towards social entrepreneurship among current and past ENACTUS students
Field: PhD: Business Admin

Researcher: Masete, J
Title: Employee Academics' perceptions of the effectiveness of the performance management system at one South African University of Technology
Field: Management

Researcher: Masoka, J
Title: The influence of employee fit dimensions on job



satisfaction, organizational citizenship behaviour and intention to stay in selected South African municipalities
Field: Human Resource Management

Researcher: Mlaza, T
Title: The relationship between secondary school educators, work engagement, general happiness and career satisfaction
Field: Human Resource Management

Researcher: Moletsane, M
Title: Master of Commerce (Title still to be approved)
Field: Management

Researcher: Moolman, R
Title: Postgraduate Diploma in Management
Field: Management

Researcher: Ndlangamandla, M
Title: Exploring the capabilities and functioning of human resource departments in pursuit of effective human resource management in higher education institutions
Field: Industrial Psychology

Researcher: Rangaza, K
Title: Modelling the standard of living among youth-headed households in South Africa
Field: Economics

Researcher: Rundora, R
Title: Financial literacy, entrepreneurial intention and entrepreneurial readiness of University students
Field: PhD: Accountancy

Researcher: Poole, B
Title: Signalling internal audit effectiveness
Field: PhD: Accountancy

Researcher: Tshabalala, M
Title: Flourishing: Exploration, development, validation, and application of a new instrument within the South African context
Field: Industrial Psychology

Researcher: Mudhombo, I
Title: Multicollinearity and shrinkage techniques in the regression quantile framework
Field: PhD: Accountancy

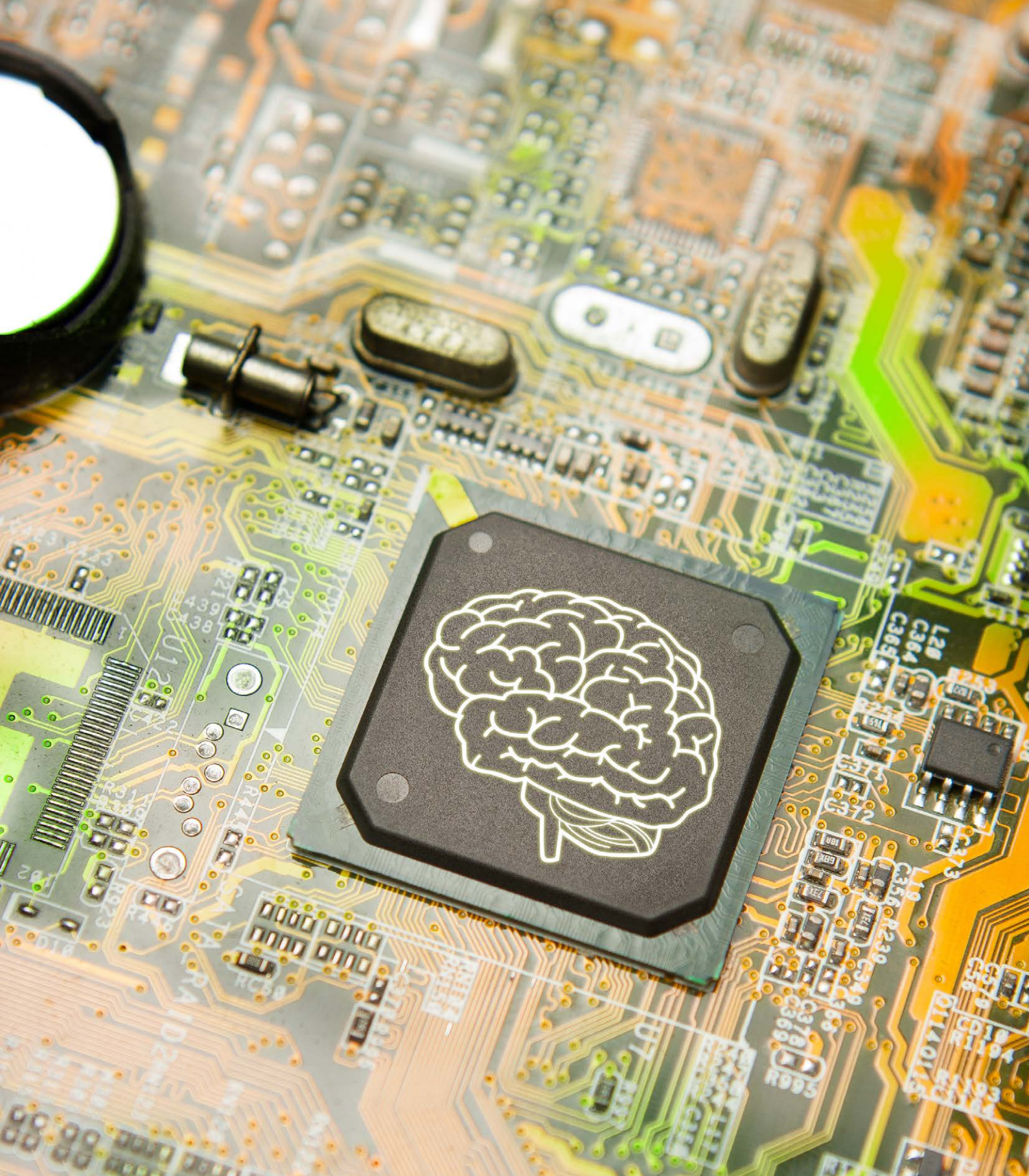
Researcher: Robbette, N
Title: Incorporating social media into management accounting education
Field: PhD: Accountancy

Researcher: Makhuvele, Mr
Title: Financial literacy amongst VUT employees
Field: Masters: Accountancy

Researcher: Zeni, M
Title: Validation of the employability of entry-level HR graduates in the South African labour context
Field: Human Resource Management

Research Events/Capacity Building

Dr C. Marais. ILOITC – Employment and decent work for peace and resilience. 29 June 2020-07 Augustus 2020 Online (Turin, Italy)



RESEARCH FOCUS AREAS/INSTITUTES/CENTRES

The following are approved Research Focus Areas/Institutes/Centres:

Centre/Institute	Director
Centre of Sustainable Livelihoods	
Centre for Alternative Energy	Dr Johan Bekker
Centre for Renewable Energy and Water	Prof. George Ochieng

Focus Areas	Research Leader
Plant Molecular Genetics/Biotechnology	Prof Michael Pillay
Materials and Minerals Technology	Prof Peter Mendonidis

Technology Transfer and Innovation	Leader
Innovative Product Development and Advanced Manufacturing Technology	

CENTRE FOR ALTERNATIVE ENERGY (CAE)

The productive progress of applied Research was under extreme pressure in 2020, and within the CAE, it was no different. However, the CAE made progress, and successes were achieved in quite a few areas. Some postgraduate students made good progress with their research; we had one DEng completion and an MEng submission, among other progressions. The MEng (Energy Efficiency) was launched under challenging circumstances, with 25 students registering in March 2020 and 22 still active, with most completing the four theoretical modules. There will be a massive attempt in 2021 to complete Research Projects and will have our first group of graduates soon.

Furthermore, the solar installation in the S-block keeps on generating electricity, and in the process, saving the University significantly on the electricity bill. We discussed installations of solar generation systems in other buildings and parking areas within VUT at meetings, and finalisation of these projects are expected in 2021. Collaboration with other institutions continues with a new Memorandum of Agreement signed with the University of Cape Town for Fuel Cell Membrane Research.



In conclusion, I would like to express our appreciation and gratitude towards Telkom and ATC SA for their generous financial support towards our research and students.

The CAE focus on:

- Off-grid electricity supply to rural communities
- Energy Efficiency in buildings and households
- General Alternative Energy supply
- Fuel Cell and Hydrogen research
- Printing of Fuel Cell Membrane Electrode Assemblies.

Collaboration:

- University of Cape Town (UCT) - Fuel Cell Membrane Research
- DST Hydrogen Infrastructure Centre of Competence (HySa Infrastructure) at North-West University (NWU)
- Through the PEESA III project:
 1. Hochschule Wismar in Germany
 2. Fachhochschule Flensburg in Germany
 3. USZ (Szczecin) in Poland
 4. ULBS (Sibiu) in Romania
 5. Cape Peninsula University of Technology
 6. Durban University of Technology
 7. Tswane University of Technology

External Financial Support

- Telkom SOC Pty Ltd (Telkom Centre of Excellence)
- American Tower Company (ATC) SA
- Personalised Engineering Education in South Africa (PEESA III); supported by the European Union through the Erasmus+ programme.
- Hydrogen South Africa (HySa) through UCT and NWU.

PROF JOHAN BEKKER
CENTRE for ALTERNATIVE ENERGY

ACCREDITED RESEARCH OUTPUTS FOR VUT, 2012-2020

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020*
Units	75.30	94.96	100.80	76.16	101.95	126.76	149.74	164.76	In process
*Submitted to DHET - not yet approved									

National Research Foundation (NRF)

The NRF rating system is a benchmarking system through which individuals that exemplify the highest standards of research, as well as those demonstrating strong potential as researchers, are identified by an extensive network of South African and international peer reviewers.

NRF Rated Researchers in 2020

Surname	Initials	Title	Rating Category
Campbell	RI	Prof	C1
Okosun	O	Dr	C2
Osifo	PO	Prof	C2
Pakade	VE	Dr	Y2
Pillay	M	Prof	C3
Rutto	HL	Prof	C3
Tengen	TB	Prof	C3

Postdoctoral Research Fellows and Visiting Lecturers, 2020

Surname	Title	Name	Postdoc/ Visiting Professor	Faculty	Department	PI
Chiririwa	Dr	Harry	Postdoctoral Research Fellow	Applied and Computer Sciences	Chemistry	Prof EB Naidoo
Diagboya	Dr	Paul Nkem	Postdoctoral Research Fellow	Applied and Computer Sciences	Chemistry	Prof ED Dikio
Omwoyo	Dr	Wesley Nyaigoti	Postdoctoral Research Fellow	Applied and Computer Sciences	Chemistry	Prof MJ Moloto
Dunga	Dr	Hannah Mayamiko	Postdoctoral Research Fellow	Management Sciences	Logistics	Prof C Mafini
Nziu	Dr	Patrick Kiola	Postdoctoral Research Fellow	Engineering and Technology	Mechanical	Prof LM Masu
Akpotu	Dr	Samson Oghenemauro	Postdoctoral Research Fellow	Applied and Computer Sciences	Chemistry	Dr M Klink
Apollo	Dr	Seth Otieno	Postdoctoral Research Fellow	Engineering and Technology	Chemical Engineering	Dr J Kabuba
Olaifa	Dr	Moses Oluwasogo	Postdoctoral Research Fellow	Applied and Computer Sciences	ICT	Prof T Zuva
Lawal	Dr	Isiaka Ayobamidele	Postdoctoral Research Fellow	Applied and Computer Sciences	Biotechnology	Dr M Klink
Matjie	Dr	Ratale Henry	Visiting Lecturer	Engineering and Technology	Chemical Engineering	Prof P Osifo
Mitema	Dr	Alfred Ochieng	Postdoctoral Research Fellow	Applied and Computer Sciences	Biotechnology	Dr N Feto
Ama	Dr	Monday Onoyivwe	Postdoctoral Research Fellow	Engineering and Technology	Chemical Engineering	Prof P Osifo
Ouma	Dr	Immaculate Linda Achieng	Postdoctoral Research Fellow	Applied and Computer Sciences	Chemistry	Prof Ofomaja

Andoh	Dr	Harris Francis	Postdoctoral Research Fellow	Research Directorate	Research Directorate	Dr SM Nelana
Maube	Dr	Obadiah	Postdoctoral Research Fellow	Engineering and Technology	Mechanical	Prof AA Alugongo
Peleyeju	Dr	Moses Gbenga	Postdoctoral Research Fellow	Applied and Computer Sciences	Chemistry	Dr E Viljoen
Aremu	Dr	Oluwale Samuel	Postdoctoral Research Fellow	Applied and Computer Sciences	Chemistry	Dr Qwebani
Airo	Dr	Mildred Awuor	Postdoctoral Research Fellow	Applied and Computer Sciences	Chemistry	Prof MJ Moloto
Leudjo-Taka	Dr	Anny	Postdoctoral Research Fellow	Applied and Computer Sciences	Chemistry	Dr M Klink
Monapathi	Dr	Mzimkhulu Ephraim	Postdoctoral Research Fellow	Applied and Computer Sciences	Chemistry	Prof SJ Modise
Oyedeji	Dr	Ajibola Bamikole	Postdoctoral Research Fellow	Human Sciences	Centre of Sustainable Livelihood	Prof E Egal
Avoseh	Dr	Opeyemi Nude-whenu	Postdoctoral Research Fellow	Applied and Computer Sciences	Chemistry	Prof FM Mtunzi

RESEARCH CAPACITY DEVELOPMENT PROGRAMMES

Various research capacity development workshops and information sessions were hosted by the Research Directorate, including:

- Writing a thesis
- Writing a good literature review
- Research Methodology
- Literature review
- Research Proposal writing
- Grant proposal writing
- Writing for publication
- Writing for publication retreat
- Research Ethics
- Strengthening Postgraduate Supervision
- EndNote
- Design Expert

RESEARCH AWARDS

Research awards are presented annually to recognise staff members for their research contributions

- Research & Innovation Achievement Awards
- Research & Innovation Excellence Recognition Awards

The following staff received awards for their research achievements during 2019:

Achievement Awards

Faculty of Applied & Computer Sciences	
1st	Dr W Matli
2nd	Dr M Klink
3rd	Dr ND Shooto

Faculty of Human Sciences	
1st	Ms M Sowerby
1st	Ms L Strydom
1st	Mr J Kotze
1st	Mr S Bogle

Faculty of Management Sciences	
1st	Dr Fathima Essop Mahomed

Excellence Awards

Faculty of Applied & Computer Sciences	
1st	Prof T Zuva
2nd	Prof F Mtunzi
3rd	Prof MJ Moloto
Faculty of Engineering & Technology	
1st	Prof LM Masu
2nd	Prof IO Otunniyi
3rd	Dr JK Tshilenge
Faculty of Human Sciences	
1st	Prof L Muswaka
1st	Dr S Lebelo
2nd	Dr D Venter
2nd	Prof A Egal
2nd	Ms K Chmela-Jones
3rd	Dr L Lekaota
3rd	Prof CM van der Bank
3rd	Prof A Munro

Faculty of Management Sciences	
1st	Prof M Dhurup
2nd	Dr E Chinomona

ANNUAL RESEARCH AWARDS

Place	Research Achievement	Faculty
1st	Dr W Matli	Applied & Computer Sciences
2nd	Dr M Klink	Applied & Computer Sciences
3rd	Dr ND Shooto	Applied & Computer Sciences
3rd	Dr FE Mahomed	Management Sciences

Place	Research Excellence	Faculty
1st	Prof LM Masu	Engineering & Technology
2nd	Prof M Dhurup	Management Sciences
3rd	Dr E Chinomona	Management Sciences

Acknowledgement for contributing to research in 2019

Research Achievement	Faculty
Dr S Takaidza	Applied & Computer Sciences

Research Excellence	Faculty
Dr NA Feto	Applied & Computer Sciences
Prof M Pillay	Applied & Computer Sciences
Dr WR Matizamhuka	Engineering & Technology
Ms M van der Bank	Human Sciences
Dr K Dube	Human Sciences

Research funding

External funding

External research funding and donations for research equipment totalled R 18,234,147.44 for 2020. Sources of funding include the National Research Foundation (NRF); Telkom SA SOC Limited Eskom; Sasol; CSIR, Department of Higher Education (DHET UCDP); Ti-COC; COCA Chemicals and Consulting (Pty) Ltd and PAMSA.

Internal funding

R13 630 216.00 were allocated to research. Applications for funding are approved by the Executive Senate Research and Innovation Committee.

POSTGRADUATE REPORT 2020 HIGHLIGHT

Registration totals 2016-2020

Total Registration	2016	2017	2018	2019	2020
Applied and Computer Sciences	146	148	141	149	147
Engineering and Technology	146	149	148	197	195
Human Sciences	51	56	45	61	68
Management Sciences	135	142	162	155	188
Total	478	495	496	562	597

Postgraduate Study Fees

Postgraduate Study Fees Increase By 8% Per Year

	2015	2016	2017	2018	2019
Total fees per year:					
M-Tech:	R5 090.00	R5 090.00	R5 550 00	R5 940.00	R6 250.00
Masters/MEng:				R9 600.00	R10 110.00
D-Tech:	R3 820.00	R3 820.00	R4 130.00	R4 460.00	R4 690.00
PhD/DEng			R8 890.00	R9 600.00	R10 110.00

2020 Postgraduate Statistics – (Per Faculty, per department)

Faculty of Applied and Computer Sciences			
Department	Registered Students	M-Tech	D-Tech/PhD
Chemistry	39		5+15
Biotechnology	32		14
Information Technology	33		
Information Systems			1+7
TOTAL	104		42
Grand total: 146			

Faculty of Engineering and Technology			
Department	Registered Students	M-Tech	D-Tech/PhD
Chemical Engineering	44		14
Metallurgical Engineering	22		0

Mechanical Engineering	33	13
Industrial Engineering	9	
Electrical Engineering	26	9
Civil Engineering	24	1
TOTAL	158	37
Grand total: 195		

Faculty of Human Sciences		
Department	Registered Students M-Tech	D-Tech/PhD
Education		
Tourism and Hospitality Management	14	
Public Relations Management	23	
Photography	3	
Visual Design in Multimedia	2	
Visual Design in Graphical Design	2	
Food Service Management	2	5
Food and Beverage Management	4	
Visual Design in Fine Art	9	
Visual Art		1
Fashion	3	
TOTAL	62	6
Grand total: 68		

Faculty of Management Sciences		
Department	Registered Students M-Tech	D-Tech/PhD
Marketing	19	3
Logistics/Supply Chain	34	
Labour Relations Management	7	
Human Resources Management	27	
Cost and Management Accounting	17	
Business Administration	42	5+34
TOTAL	146	42
Grand total: 188		

Masters	470
D Tech / PhD	127
TOTAL	597

RESEARCH OFFICE



Dr Simphiwe Nelana
Director: Research & Higher Degrees



Ms Petro van der Walt
Senior Administrator: Research



Ms Chantelle Sonnekus
Research Development Officer



Ronel Appelcryn
Research Administrator



Mr. Prajesh Bhikha
Marketing & Information Officer



Beatrice Phume
Higher Degrees Administrator



Nomathemba Kokoali
Postgraduate Administrator



Lerato Ngubeni
Research Administrator



Searabo Kgekoane
Research Information Officer



Sehlabaka Motsie
Faculty Research Officer



Shirene Klink
Finance Officer



Vulani Mahlaule
Research Administrator



Thakasile Nkwanyana
NRF Financial Officer

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