Book of Abstracts
# TABLE OF CONTENTS

**ACKNOWLEDGEMENTS** .......................................................................................................................... 1  
**COMMITTEES** ...................................................................................................................................... 2  
**PREFACE** ............................................................................................................................................. 3  
**LIST OF ACRONYMS** ............................................................................................................................ 4  
**THEMATIC AREA 1: HEALTH AND WELLNESS** ..................................................................................... 5  
  The Changing Face of Pregnancy in South Africa .................................................................................. 6  
  Learner/Student Performance as a Reflection of Leadership Ability for Transformation .................. 7  
  Tapping into Traditional Techniques to Exclude Deer and Wild Boars to Enhance Local Education at Elementary Schools .................................................................................................................. 8  
  Improving the Public Health Sector in South Africa: Eliciting Public Preferences Using a Discrete Choice Experiment ............................................................................................................................................. 9  
  Risk Evaluation of Vector Control to the Ecosystem and the Human Health in a Malaria Control Area. 10  
  Review on the State of GIS Application in Secondary Schools in the Southern African Region ......... 11  
  Artificial Intelligence (AI) Brings Innovation in Dental Imaging Diagnosis ......................................... 12  
  Empowerment of Township Students in South Africa through the Learning Improvement Project ....... 13  
  Development of Skills and Capabilities of Students with Disabilities in Technical Vocational Education and Training Colleges in South Africa to Achieve their Security Needs .................................................................................. 14  
  Support Services for Students with Disabilities in Technical and Vocational Training Colleges in South Africa .................................................................................................................................................. 15  
  Anthropometric Profile and Dietary Intake of an Emerging Middle Income Community ................... 16  
  Establishment of an Early Warning System for Malaria in Southern Africa, Incorporating Climate Predictions: Overview of the IDEWS Project ........................................................................................... 17  
  The Experiences of Early Career Academics at the University Of Venda (2014 -2018) .................... 18  
  The Influence of Traditional Healing Practices on Anti-Retroviral Treatment Adherence in Vhembe District, South Africa ................................................................................................................. 19  
  Applying Indigenous Knowledge Systems Related to Local Insect Resources for Conservation Education in South Africa and Japan ........................................................................................................... 20  
  Tapping into the Value of Edible Insects for Education and Ecotourism ............................................ 21  
  Relationship between Infant Feeding Practices and Caregivers’ Nutrition Knowledge on the Nutritional Status of Infants ........................................................................................................... 22
Rethinking Service Delivery Processes: The Role of Municipal Services Partnerships in Basic Service Delivery - A Case Study of Sekhukhune District Municipality, Limpopo Province, South Africa........ 23
Lesson Study in Initial Teacher Education: The Case of the University of Pretoria, South Africa .... 24
The Infectious Diseases Early Warning System ............................................................................. 25
The Japan-Africa Collaborative Research on Helicobacter Pylori Project ........................................ 26
Learning and Intelligence in the Age of AI ...................................................................................... 27

THEMATIC AREA 2: SECURITY AND SOCIAL JUSTICE .................................................................... 28
Mobility with Vulnerability of Mozambican Female Migrants to South Africa: Outflow from the Periphery ................................................................................................................................. 29
Populism, Personal Values and Planetary Governance ................................................................. 30
Separation of Waste Solvent Containing Organic Solution for CO₂ Reduction Processes Investigated by Molecular Modeling ......................................................................................................................... 31
Learning from Situatedness of Indigenous Knowledge: From Case Studies in Fishing Regions in Japan ................................... 32
SDGs Booming in Japanese Big Businesses: Can “SDGs” Change their Strategies and Perspectives? ... 33
Cooperation or Competition: Regional Economic Governance and Japan ........................................ 34
Politicisation of Immigration in Electoral Discourse in South Africa ............................................. 35
Youth and Political Participation: Is Zimbabwe’s Democracy Greying? ........................................... 36
Beyond Waiting Politics in Conservation: Forests and the Power of the Marginalised in Southern Africa ..................................................................................................................................................... 37
“Doing” the 4.0 Industrial Revolution in the South African Workplace while Recognising the Socio-Political and Economic Challenges of the Past ...................................................... 38
Reconsidering “Inclusive Growth” and Gendered Economic Security: Toward Constructing Comparative Research Agendas .................................................................................................................. 39
Being Disabled in this Day and Age: Assessing Economic Empowerment of Japanese and South African Disabled Citizens ........................................................................................................ 40
Indigenous Ways of knowing to support Education for Sustainable Development: Lessons from Japan 41
Energy Security and Challenges of Transition to Green Economy in South Africa ............................. 42
Precarious Livelihoods and Changing Gender Relationship among Congolese Female Migrants in South Africa .................................................................................................................................................. 43
International Relations of Everydayness .......................................................................................... 44
Promoting Human Security in Southern Africa: Reflections on the Cooperation between the University of the Free State and Osaka University ................................................................. 45
Resource Management and Political Power in Rural Africa ............................................................ 46
Citizen Participation, Social Exclusion, and Insecurity – An Examination of Participatory Systems in Local Government in South Africa .......................................................................................... 47
Living on the Margin: The Demographics of Population Ageing and its Implications for Social Protection in South Africa .................................................................................................................. 48

THEMATIC AREA 3: GROWTH, EXPLORATION AND CONSERVATION ...................................... 49
Developing Manufacturing Leadership in South Africa (and Regionally): The Role of Monozukuri .... 50
SA-Japan Collaboration in Earthquake Science since 1994 ............................................................. 51
Study on Implementation of Wi-Fi Direct Utilizing Smart Mining in Monitoring Stress States in Underground Mines in South Africa ................................................................. 52
Using Satellite Data to Assess the Impact of Agricultural Minimum Wages in South Africa .......... 53
What Determines the Strictness of Documentation Regulation in Transfer Pricing? ......................... 54
Characterization Of WFGD Gypsum as a By-Product and its Compatible Additives for Building and Construction ................................................................. 55
Using Microbiomics to Understand Biogeochemistry in the Pacific and Southern Oceans ................ 56
Utilization of Spent Foundry Sand and Plastic Waste to Produce a Building Material ....................... 57
Indigenous Knowledge Inherent in Traditional Beekeeping as Minor Subsistence in Tsushima Island, Japan ............................................................................................... 58
Rethinking the Global Role and Significance of ‘Otaku’ in Innovation and Diffusion of Pop Culture.... 60
South African Investment and Contract Farming: The Case of Beer Industry in Uganda ................. 61
High School Students and Harvesters Collaborate in the Cultural Practice of Vespula Spp. Rearing and Utilisation in Japan ................................................................. 62
Enhancing the Growth and Development Impact of Japanese Direct Investment in South Africa .......... 63
(Micro)Biological Hot Spots in the Southern Ocean ........................................................................ 64
Multiple Uses of Termites and Termite Mounds in Southern Africa and Southeast Asia .................. 65
Citrus Limon Waste: Medicinal and Agricultural Economic PotentialS .......................................... 66
Microalgae Cultivation Using Wastewater at Demonstrate Scale for Various Commercial Applications 67
Showcasing the Use of Edible Insects from Africa and Japan .............................................................. 68
Research on Environmental Chemistry: Membrane Technology .......................................................... 69
Combining the Conservation of Intangible Cultural Heritage with Partnerships as a Way into the Future at the International Library Of African Music (ILAM), Rhodes University .......................................................... 70
Utilising Biomarkers in a Multispecies Approach to Relate Organochlorine Exposure to Biological Effects: The Kruger National Park and Phongolo Floodplain Experience ......................................................... 71
Assessment of Impact of Climate Change on Water Security in South Africa: A Case Study in a Semi-Arid River Basin .................................................................................... 72

THEMATICAL AREA 4: TECHNICAL SESSION ON MODALITIES OF RESEARCH SUPPORT AND STAFF AND STUDENT MOBILITY .............................................................. 73
Y4SDGs (Videos and Webs): Connecting International Students to Japanese Business through SDGs.. 74
Educational Program for Qualified Experts in Blue Economy ............................................................. 75
JF Oberlin University International Exchange ......................................................................................... 76
Research and Education of University of Tsukuba on Africa .............................................................. 77
Constructing a Deep “Inter-disciplinary Study”: The Attempt of Doshisha University’s Global Studies Program ................................................................................................. 78
International Service-Learning Experiences at International Christian University in Japan ............... 79
Internationalisation at Wits University .................................................................................................. 80
Impact of the New Curriculum on Industry’s Needs: A Study of Durban University of Technology (DUT) ................................................................................................................ 81
ACKNOWLEDGEMENTS

The following organisations are thanked for their support for the 2019 SAJU Forum.

In particular Toshiba, the National Research Foundation, the Department of Higher Education and Training, and the Embassy of Japan in South Africa for their financial contributions.

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Japan Science and Technology Agency (JST)
Japan Society for the Promotion of Science (JSPS)
Japan-Africa Academic Network (JAAN)

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PREFACE

A very deliberate decision taken jointly by the Japanese and South African organisers of the 4th SAJU Forum Conference was aimed at making this an academic conference so that a firm and lasting platform could be established for this collaboration between universities in both countries.

The Conference has been organised with the theme: *The Human Being in 21st Century in the Context of Global Changes*. A call for abstracts was made under four subthemes

- Health and Wellness
- Security and Social Justice
- Growth, Exploration and Conservation
- Technical and Logistical Issues on International Collaboration

More than 70 abstracts have been received.

These were distributed to 12 senior academics for review and for an assessment of appropriateness for the programme. This selection of abstracts has been chosen either for presentations or for poster presentations.

These papers will provide the basis for the SAJU Forum to provide the basis for an ongoing and sustainable programme of research and postgraduate education done in partnership between Japanese and South African academics and students. This will help to catapult South Africa – Japan collaboration to new levels.

第4回SAJUフォーラムは、日本および南アフリカ側の総意に基づき学術カンファレンス形式で開催することとなりました。これは両国の大学間で緊密でかつ継続的な学術交流プラットフォームを形成することを目指すものです。

本フォーラムは“*The Human Being in 21st Century in the Context of Global Change*”を統一テーマに、以下の4つのテーマ別分科会での発表を募集しました。

- Health and Wellness
- Security and Social Justice
- Growth, Exploration and Conservation
- Technical and Logistical Issues on International Collaboration

集まった70以上の発表要旨は日本および南アフリカの研究者による12名からなるアカデミックコミッティメンバーの査読を経て、口頭あるいはポスター発表に割り振られました。

これらの発表は、SAJUフォーラムが日本と南アフリカの研究者および学生間のパートナーシップのもと、持続的な研究教育連携を推進するための礎となるものです。本フォーラムが日本と南アフリカの学術連携を更なるステップに向かわせる推進力となることを祈念しています。
# LIST OF ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Name</th>
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<tr>
<td>ACCESS</td>
<td>Applied Centre for Climate and Earth Systems Science (South Africa)</td>
</tr>
<tr>
<td>AMED</td>
<td>Japan Agency for Medical Research and Development</td>
</tr>
<tr>
<td>CSIR</td>
<td>Council for Scientific and Industrial Research (South Africa)</td>
</tr>
<tr>
<td>DHET</td>
<td>Department of Higher Education and Training (South Africa)</td>
</tr>
<tr>
<td>DST</td>
<td>Department of Science and Technology (South Africa)</td>
</tr>
<tr>
<td>GIBS</td>
<td>Gordon Institute of Business Science</td>
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<tr>
<td>GO-MARCH</td>
<td>Global Oita Medical Advanced Research Center for Health</td>
</tr>
<tr>
<td>HSRC</td>
<td>Human Sciences Research Council (South Africa)</td>
</tr>
<tr>
<td>IDE-JETRO</td>
<td>Institute for Developing Economics, Japan Trade External Organization</td>
</tr>
<tr>
<td>JAAN</td>
<td>Japan-Africa Academic Network</td>
</tr>
<tr>
<td>JAMSTEC</td>
<td>Japan Agency for Marine-Earth Science and Technology</td>
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<tr>
<td>SARChI</td>
<td>South African Research Chairs Initiative</td>
</tr>
<tr>
<td>SATREPS</td>
<td>Science and Technology Research Partnership for Sustainable Development</td>
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<tr>
<td>TICAD</td>
<td>Tokyo International Conference on African Development</td>
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<td>TUFS</td>
<td>Tokyo University of Foreign Studies</td>
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<td>TUMSAT</td>
<td>Tokyo University of Marine Science and Technology</td>
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<tr>
<td>TWIMS</td>
<td>Toyota Wessels Institute for Manufacturing Studies</td>
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<td>UoT</td>
<td>University of Technology</td>
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THEMATIC AREA 1: HEALTH AND WELLNESS
THE CHANGING FACE OF PREGNANCY IN SOUTH AFRICA

Bothma, S
(University of Pretoria, South Africa)

Researcher

Obstetric Medicine is the management of medically complicated pregnancies. In a developing country such as South Africa maternal healthcare is currently a top priority for the government. Due to the high burden of HIV/AIDS and the complication of opportunistic infections, more pregnancies need additional healthcare than before. Due to westernisation and lifestyle changes, more pregnancies are complicated by gestational diabetes and hypertension than ever before. Due to improving equal opportunities in the workplace, women are delaying pregnancy till a later age in order to build a career. This presentation aims to discuss the changing morbidity associated with pregnancy. Data will be presented examining causes of maternal deaths as compiled in the South African National Committee on Confidential Enquiry into Maternal Deaths 2015 Saving Mothers Report. Data will be presented on the magnitude of patients with gestational diabetes at Kalafong Academic Hospital. Data will be analysed by using the number of deliveries per year at Kalafong Hospital compared to the number of pregnancies complicated by diabetes, whether gestational or pre-existing diabetes. The presentation will also discuss the need for and evolution of Obstetric Medicine as a sub-speciality in South Africa.

Keywords: Obstetric, Medicine, Diabetes

Biography:
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After specializing as a physician, Salome joined the Department of Internal Medicine at Kalafong Academic Hospital affiliated with University of Pretoria. Her current interests include maternal healthcare and gestational diabetes. Salome completed her undergraduate and postgraduate training at the University of Witwatersrand.

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THE CHANGING FACE OF PREGNANCY IN SOUTH AFRICA

Bothma, S
(University of Pretoria, South Africa)

Obstetric Medicine is the management of medically complicated pregnancies. In a developing country such as South Africa maternal healthcare is currently a top priority for the government. Due to the high burden of HIV/AIDS and the complication of opportunistic infections, more pregnancies need additional healthcare than before. Due to westernisation and lifestyle changes, more pregnancies are complicated by gestational diabetes and hypertension than ever before. Due to improving equal opportunities in the workplace, women are delaying pregnancy till a later age in order to build a career. This presentation aims to discuss the changing morbidity associated with pregnancy. Data will be presented examining causes of maternal deaths as compiled in the South African National Committee on Confidential Enquiry into Maternal Deaths 2015 Saving Mothers Report. Data will be presented on the magnitude of patients with gestational diabetes at Kalafong Academic Hospital. Data will be analysed by using the number of deliveries per year at Kalafong Hospital compared to the number of pregnancies complicated by diabetes, whether gestational or pre-existing diabetes. The presentation will also discuss the need for and evolution of Obstetric Medicine as a sub-speciality in South Africa.

Keywords: Obstetric, Medicine, Diabetes

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LEARNER/STUDENT PERFORMANCE AS A REFLECTION OF LEADERSHIP ABILITY FOR TRANSFORMATION

Cishe, EN
Bandana (née Rambwawasvika), S
(Walter Sisulu University, South Africa)

The study sought to establish the extent to which learner/student performance is a reflection of leadership ability in selected independent senior secondary schools in the Mthatha District in the Eastern Cape. It is widely believed that good educational leaders are those found in high performing schools and weak ones in low performing schools. The aim of this study was to investigate the effect of principals’ leadership styles on learners’ academic achievement, with particular reference to the research question of the extent to which learner performance is a measure of leadership ability. Both qualitative and quantitative modes of enquiry were used. Questionnaires were administered to 50 learners and 25 teachers and 10 interviews were conducted with 5 principals and 5 board members of both high and low performing schools. Findings reveal that the failure of some principals to involve learners/students in planning and to embrace learner/student suggestions contributes to learner/student poor performance. It also transpired that punishment and reward systems were used to ensure quality passes and produce desired results. The production of good results can be linked to the thorough monitoring of learners by principals. Therefore, learner performance can to a large extent be said to be a reflection of leadership ability. It is recommended that principals liaise with learners on issues that directly affect them. Communication and building a strong relationship with learners are among the components through which learner performance becomes a measure of leadership ability. It is also recommended that principals create a conducive environment which enables learners to produce quality passes, since cooperation gives them the desire to continuously improve their performance.

Keywords: Performance, Measure, Leadership ability

Biography:
Prof. EN Cishe
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Prof. Elphinah Cishe is Associate Professor of Education at Walter Sisulu University. She has acted as Research Director, supporting all research activities, encouraging and capacitating researchers in their research and writing for publication. She is actively involved in research around transformation in Higher Education. Prof. Cishe holds a PhD in Education from Nottingham University.

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TAPPING INTO TRADITIONAL TECHNIQUES TO EXCLUDE DEER AND WILD BOARS TO ENHANCE LOCAL EDUCATION AT ELEMENTARY SCHOOLS

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Dzerefos, C (North-West University, South Africa)
Nonaka, K (Rikkiyo University, Japan)

Researcher

Indigenous knowledge collated over generations of close interaction with the environment can be used to enhance education. A case study where the traditional method for preventing damage by wild animals was implemented at an elementary school in Japan and the learning opportunities that arose were documented. Damage to crops and property by wild animals is a serious issue in both South Africa and Japan. Historically, Japanese people have taken note of the behaviour of troublesome wild animals and have developed countermeasures to protect property. In the 1800s (known as the Edo period) as well as today, deer and wild boar have been problematic in mountainous areas. The people of the Edo period built ‘Shishigaki’ to prevent the wild animals from entering their villages. This labour-intensive method involved stacking stones or pouring mud between a secured wooden frame that hardened as it dried. ‘Shishigaki’ is a wall that can be several kilometres long and about 1.6 metres high. Today, ‘Shishigaki’ is part of local cultural heritage and taught at elementary school. ‘Shishigaki’ is described in the supplementary textbook for local elementary schools in Okazaki City, Aichi Prefecture. In addition, the students of Miyazaki Elementary School at Okazaki City participate in preservation efforts initiated by the local community and experience hands-on learning. While participating in preserving the walls, elders shared their knowledge of local history, the natural environment and the cultural heritage with the children.

**Keywords:** Local education, Damage by wild animals, Shishigaki, Hands-on learning, Okazaki City

**Biography:**
Dr Misao Hashimoto  
Associate Professor, Faculty of Education  
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Within the discipline of biogeography, Hashimoto has studied damage caused by wild animals and wildlife hunting. She has been involved in environmental education and disaster prevention education since 2015 and plays a traditional musical instrument.

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IMPROVING THE PUBLIC HEALTH SECTOR IN SOUTH AFRICA: ELICITING PUBLIC PREFERENCES USING A DISCRETE CHOICE EXPERIMENT

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(Sophia University, Japan)

Ryan, M (University of Aberdeen, United Kingdom)
Van Niekerk, R (Rhodes University, South Africa)
McIntyre, D (University of Cape Town, South Africa)

The introduction of National Health Insurance (NHI), aimed at achieving universal coverage, is the most important issue currently on the South African health policy agenda. Improvement in public sector health care provision is crucial for the successful implementation of NHI as - regardless of whether health care services become more affordable – people will not use the services provided if the quality of the services is not acceptable. Although there has been criticism of the quality of public sector health services, limited research is available to identify what communities regard as the greatest problems with the services. A discrete choice experiment (DCE) was undertaken to elicit public preferences on key dimensions of quality of care when selecting public health facilities in South Africa. Qualitative methods were applied to establish attributes and levels for the DCE. To elicit preferences, interviews with community members were held in two South African provinces: 491 in Western Cape and 499 in Eastern Cape. The availability of necessary medicine at health facilities has the greatest impact on the probability of attending public health facilities. Other clinical quality attributes (viz. provision of expert advice and provision of a thorough examination) are more valued than non-clinical quality of care attributes (viz. staff attitude, treatment by doctors or nurses, and waiting time). Treatment by a doctor (versus another health professional) was less valued than all other attributes. Communities are prepared to tolerate public sector health service characteristics such as a long waiting time, poor staff attitude and lack of direct access to doctors if they receive the medicine they need, a thorough examination and a clear explanation of the diagnosis and prescribed treatment from health professionals. These findings prioritise issues that the South African government must address in order to meet their commitment to improving public sector health care service provision.

Keywords: Discrete choice experiment, Quality of care, Public preferences, National Health Insurance

Biography:
Dr Ayako Honda
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Sophia University
Japan

Ayako undertakes health systems research in Asia and Africa, focusing on healthcare financing for universal health coverage, healthcare worker motivation and incentives, and discrete choice experiment as a method for understanding people’s values. Between 2009 and 2017, she was based in the Health Economics Unit at the University of Cape Town.

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The use of DDT has been resumed in some countries for the control of mosquito-borne diseases including malaria since 2006. There are environmental concerns about DDT reintroduction and the potential deleterious effects on humans and wildlife. Several studies have already reported the toxic effects of DDT on steroid hormone biosynthesis but an accurate understanding of the underlying mechanisms and the environmental effects has not yet been attained. In this study, we aimed to elucidate the toxic mechanisms of DDT exposure in wild rats collected from an area where DDT is still being sprayed, and to explore new biomarkers for exposure assessment. Thirty seven rats were collected in the region where DDT is still being sprayed in the Republic of South Africa. Liver concentrations of DDT and its metabolite DDE were measured using a GC/ECD, and based on the synthesized cDNA from the rats’ liver, real-time PCR was used to quantify the gene expression levels. Furthermore, metabolome analysis was performed on the collected blood. The chemical analysis revealed high concentrations of DDT and DDE in the rats’ liver (total DDT concentration: 59-5237 ng/g wet weight). The relationship between the gene expression levels and the accumulation of DDTs in the liver were analyzed. A significant positive correlation was found between DDTs and gene expression levels associated with steroid hormones and also between DDTs and gene expression levels of enzymes regulated by nuclear receptors such as CAR (constitutive androstane receptor) and PPAR (peroxisome proliferator-activated receptor). Furthermore, the results of metabolome analysis allowed us to extract core factors statistically related to DDT exposure. This study allowed clarification that DDT exposure affects gene expression in wild rats living in areas where DDT is actually being applied.

**Keywords:** Vector control, DDT, Wild rodent, Microarray, Metabolome

**Biography:**
Dr Yoshinori Ikenaka  
Associate Professor, Faculty of Veterinary Medicine  
Department of Environmental Veterinary Sciences, Laboratory of Toxicology  
Hokkaido University, Japan

Yoshinori Ikenaka is a researcher in the Laboratory of Toxicology, Faculty of Veterinary Medicine, Hokkaido University. His research background is Environmental Toxicology and Analytical Chemistry. He is trying to develop biomonitoring tools for exposure assessment and health risk assessment against harmful environmental contaminants.

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The use of geographical information systems (GIS) is attracting growing global enthusiasm among scholars and in the scientific world. Due to the significance of GIS and the increased demand for its use, its application in secondary school education has also become very important at both national and international levels. This paper reviews the current state of GIS application in Southern African secondary schools. Although GIS is included in the education curriculum in several African countries, some countries still trail behind. Furthermore, despite the fact that good progress has been made with GIS education, many learning institutions in Africa still face challenges regarding its development and application as a teaching and learning tool. The main problems identified in this review include the absence of GIS education in secondary school curricula; the shortage of experienced teachers; the lack of knowledge and technical expertise; the unwillingness of teachers to change their mode of teaching; a shortage of funds; and inadequate resources. This review is hoped to inform bodies of scholars about the state of GIS application in secondary school education in Southern Africa and to infuse interest and collaboration across borders to exchange knowledge and support.

**Keywords:** Africa, GIS, Secondary school education, Review, Problems

**Biography:**
Dr Maureen Kapute Mzuza
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Dr Kapute Mzuza is a post doctorate fellow at North-West University (Potchefstroom Campus) in South Africa. She has been researching Geographical Information Systems (GIS) in Education which is under the Geography Department in the Faculty of Education at North-West University. She did her PhD in Physical Geography at East China Normal University in China in 2017. She is a teacher by profession.

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ARTIFICIAL INTELLIGENCE (AI) BRINGS INNOVATION IN DENTAL IMAGING DIAGNOSIS

Katsumata, A  
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Researcher

The development of artificial intelligence (AI) based computer assisted diagnosis/detection (CAD) systems for diagnostic imaging is progressing. One expected use of CAD system is to detect radiological signs of various diseases in the dental panoramic radiograph. Panoramic radiography is the most frequently used imaging examination in dental practice. Up to 90% of dental offices own a panoramic radiographic device. About 10 million panoramic images are acquired per year in Japan. The regions imaged include not only the teeth and jaws, but also the nasal and cervical regions. It was quite natural for panoramic radiograph to be chosen as the objective modality to develop CAD systems. The target diseases for CAD systems include medical systemic disease such as osteoporosis. Teleradiology is becoming widespread in medical hospitals but has not made inroads in dentistry. Therefore we designed a systematic approach to screening panoramic radiographs by means of a combination of CAD and teleradiology. In this approach, a dental practitioner sends panoramic images to a CAD system. CAD assesses the images automatically and routes those cases with possible disease to teleradiology. We think that the combination of CAD and teleradiology is useful for improving patient care through the early detection of disease.

Keywords: Artificial intelligence, Dental radiography, Computer assisted diagnosis/detection systems, Osteoporosis

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Since obtaining his PhD from Asahi University in Japan in March 1993, Prof. Katsumata has studied in the fields of radiology and dentistry. He is working on the development of artificial intelligence (AI) based diagnostic devices including a system to screen osteoporosis patients using dental radiography.

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EMPOWERMENT OF TOWNSHIP STUDENTS IN SOUTH AFRICA THROUGH THE LEARNING IMPROVEMENT PROJECT

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Researcher

Even after the end of segregation in South Africa, black people are still exposed to critical trials and tribulations. The Center for the Study of International Cooperation in Education (CICE) at Hiroshima University has been working closely with the University of Pretoria for many years on joint research on education for greater inclusiveness of township students. As part of the center’s interest in conducting comparative research amongst countries in the Africa-Asia University Dialogue for Educational Development network, the Universities of Pretoria and Hiroshima joined forces in a collaborative research project to improve the teaching and learning of elementary school science. Previously disadvantaged schools in South African townships were identified as potential beneficiaries of the collaborative research project which was designed to introduce a sustainable system model for the improvement of learners’ academic performance. The project targeted elementary school science on the premise that the knowledge gained at this level serves as a foundation for higher grades. The project entailed working with the Grade 6 Natural Sciences teacher at an elementary school in Mamelodi township to co-develop and implement an innovative homework project with parental involvement (HPPI). The HPPI is a teaching and learning approach that was designed to improve learning in three areas, strengthening the basic cognitive levels of recall and understanding, improving academic performance in science, and improving the self-efficacy of learners. The project has proved successful, with significant improvements in learner academic performance and extrinsic motivation. The presentation attempts firstly to explain worldwide trends in educational development and then goes on to the monograph of the project.

Keywords: Educational development, Inclusiveness, Science education, Homework with parent

Biography:
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Tatsuya Kusakabe was born in 1973. He obtained his PhD from Kyushu University in Japan and has pursued an academic career in comparative education and educational development since 2007. His research interests include the decadal transition through educational development and action research study in Asian and African countries.

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DEVELOPMENT OF SKILLS AND CAPABILITIES OF STUDENTS WITH DISABILITIES IN TECHNICAL VOCATIONAL EDUCATION AND TRAINING COLLEGES IN SOUTH AFRICA TO ACHIEVE THEIR SECURITY NEEDS

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South Africa signed and ratified the international agreements, conventions and declarations on the promotion of the rights of people with disabilities, eradication of poverty, access to education to acquire the necessary skills to access the labour market or become entrepreneurs to improve their lives. Without the necessary skills and capabilities people with disabilities cannot earn a salary and achieve their security needs. It is important to consider the role of student support services for students with disabilities in the Technical Vocational Education and Training (TVET) sector especially given the important and central role the sector is expected to play in the country’s new skills development landscape. Education is essential in developing capabilities in order for people with disabilities to acquire skills and knowledge which can be usable towards sustainable development and enhance their freedom as people aspire to meet their needs. If students with disabilities’ physiological needs are met by accessing TVET Colleges, getting support and graduating with necessary skills will enable them to access or acquire their needs of security. Therefore, the intended study based on Maslow’s hierarchy of needs and capabilities theory will try to investigate if students with disabilities who graduate from TVET Colleges have been supported towards the development of the necessary skills and capabilities to reach their security needs upon exit like their peers. The main question: does the development of skills and capabilities of students with disabilities in TVET Colleges enable them to achieve their safety/security needs as outlined by Maslow’s hierarchy of needs? Qualitative methods of data collection: interviews and focus group discussions will be considered with standard questions. The respondents will be enrolled students with disabilities at exit level and those who graduated. The limitations of the study would be inaccessibility of respondents. The expected outcome, the stereotypes about people with disabilities lead to graduates with disabilities not being offered opportunities to become economically able to acquire income to meet their security needs.

Keywords: Skills, Capabilities, Needs, Students with disabilities, Support services, Access

Biography:  
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Selina has been involved in the promotion of the rights of people with disabilities in various departments she has worked in. Graduating with a Master's Degree in Education from Hiroshima University, she got an opportunity to be an Assistant Director in the Directorate: International Scholarships offering support to international scholarship recipients studying overseas.

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SUPPORT SERVICES FOR STUDENTS WITH DISABILITIES IN TECHNICAL AND VOCATIONAL TRAINING COLLEGES IN SOUTH AFRICA

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Researcher

Education is the basic human right for all citizens in the Republic of South Africa. The Bill of Rights indicates that the State has the responsibility to facilitate accessibility to vocational and tertiary education. South Africa ratified the Convention on the Right of People with Disabilities in November 2007. The transformation of education in the country took place after the democratic election in 1994. Beyond democracy, the access, retention and success of students with disabilities in Technical Vocational Education and Training (TVET) Colleges are very low while the country has the target of 3% towards employment of people with disabilities. The purpose of this study was to investigate student support provisions for Students with Disabilities (SwDs) in TVET Colleges in South Africa and if they are offered support services to access colleges and succeed with their studies. The objectives of the study were addressed by finding out the perceptions of support services for SwDs. The main research question was, do colleges offer appropriate support to SwDs to access and succeed in their studies within TVET Colleges. Qualitative methods of data collection were used: focus group discussion, group discussions and interviews. Non-random and convenient sampling methods were used for students, and purposive sampling for student support services offices to participate in the study. Phenomenological method of data analysis was applied for this study. Findings of the study are presented in four themes which emerged from the data and aligned according to research questions to show how they respond to the research questions. The themes are separated into two themes on students and on student support services officers. The main finding was that colleges do not have capacitated disability units to address the issues of SwDs. Secondly, there is some form of supports offered to SwDs and which needs improvement and development. The recommendation of the study is that the government needs to improve student support services by addressing issues of policies, budgets, capacity, infrastructure, financial support for students and the development of staff.

Keywords: Access, Retention, Success, Students with disabilities, Support, Support services, Disability units

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The study aimed to investigate the anthropometric status and food consumption linked with developing economic prosperity. Sample size n=250 adults (56 men and 194 women) was established in a township south of Durban, South Africa. Anthropometric measurements were used to determine body mass index and waist to height ratio. Socio-demographic questionnaires established the socio-demographic profile of the households and the Multidimensional Poverty Index (MPI) was calculated as an indicator of poverty. FFQ and 24 hour food recall were administered to participants to determine food intake and variety. Data were analyzed using the Statistical Program for Social Sciences (SPSS version 23) and nutrient analysis using the FoodFinder Version 3 software developed by the South African Medical Research Council (SAMRC). The mean age was 52 years. The retired population amounted to 27.2%. The total household income averaged approximately $772.35 (R 10 000.00) per month. Prevalence of obesity was 37.59% among men and 75.5% among women. Mineral and fat soluble vitamin intake was deficient, however protein and carbohydrates were consumed in excess, with a mean of 187.7% and 111.4% respectively. This ageing population is mostly supported by another household member’s income. Although stable infrastructure and minimal poverty (MPI= 9.09) were established in this group the prevalence of over-nutrition was high. A medium food variety score was achieved with an increase in income.

Keywords: Nutrition, Obesity, Nutrition transition

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Sinenhlanhla is currently a Research Assistant in the Department of Food and Nutrition at the Durban University of Technology. Her work involves extensive use of the SAMRC FoodFinder 3 programme. Sinenhlanhla has also previously lectured in the department. Her focus areas are food and nutrition security and public health.

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In Southern Africa, where poverty is prominent, lives are threatened by infectious diseases. Recent climate changes have increased the risk of infectious disease outbreaks in unexpected regions and on scales previously unknown. This project is developing a malaria outbreak prediction model that incorporates the influences of a variety of climate factors in order to predict outbreaks of malaria that are predominantly affected by climate conditions. The ultimate aim of the research is to build an early warning system that can be applied in implementing effective countermeasures for malaria. By effectively utilizing the informative resources available to government institutions based on the early warning system, the number of people suffering from malaria can be reduced. The predictions can be applied through approaches involving appropriate preventative measures during warning periods and in high-risk regions (including implementation of countermeasures, preparation of medicines and diagnostic kits for an early response). In the future, the system can also be expected to be developed and deployed in areas outside Southern Africa.

**Keywords:** Infectious diseases, Malaria, Climate, Prediction, Limpopo, Warning

**Biography:**
Dr Noboru Minakawa
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Since 1997, Dr Noboru has been involved with studies related to malaria in Africa. Before joining Nagasaki University as Professor in 2006, he worked at the International Centre for Insect Physiology and Ecology in Kenya and the State University of New York at Buffalo in the United States as a research scientist. He has lived in Africa for more than 10 years.

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Researcher

The purpose of this study is to determine the opportunities and challenges that early career academics face in their career at the University of Venda. The argument made here is that the first years of career are very crucial in determining one’s quality and productivity in an institution. The University of Venda like other universities in South Africa is faced with challenges of increasing student numbers, lack of funding, the impact of technology, skills migration and workloads. These take their toll on the early career academics, where if not well taken care of, productivity is likely to be compromised. A qualitative research approach was employed with data being collected using semi-structured interviews to understand and identify the opportunities and challenges that early academics were experiencing in their work environment. A phenomenography theory as lens to look into their experiences and to analyse the data collected from 12 participants from the School of Human and Social Sciences (HSS) in the University of Venda is utilised. The article will investigate the experiences of those employed between 2014 and 2018 (1-5 years of experience). From the findings of this study, practical aspects will be drawn and recommendations will be made to both the institution on how best support can be provided and to early career academics on how they can deal with the challenging experiences.

Keywords: Early career academics, Experience, Workload, Productivity

Biography:
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Dr Mudimeli is currently a lecturer at the University of Venda in the Department of Development Studies. Prior to her appointment she served as a chaplain in the South African Police Service and also at the Department of Correctional Service. She is also serving as a senior pastor of Grace Missionary Chapel.

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THE INFLUENCE OF TRADITIONAL HEALING PRACTICES ON ANTI-RETROVIRAL TREATMENT ADHERENCE IN VHEMBE DISTRICT, SOUTH AFRICA

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Student

Traditional health practitioners (THPs) have been identified as a key local resource in the fight against HIV/AIDS in South Africa. However, their approaches to the treatment of people living with HIV (PLHIV) have been met with skepticism by some biomedical practitioners because of the perceived negative influence on antiretroviral therapy adherence. The objective of the study was to investigate the influence of traditional healing practices on treatment adherence in Vhembe District of South Africa. A qualitative approach was adopted by the study. The study utilized an exploratory research design. The sampling frame was drawn from individuals who are traditional healers in Vhembe District focusing on three Municipalities namely Makhado, Musina and Malamulele. Using a snowball sampling method, a sample of nine traditional healers was selected. Semi-structured interviews were used to collect data. Data was analysed using the Van Mann method. Findings revealed that the majority of PLHIV consult traditional health practitioners for medicine when they are too sick. PLHIV comprehend traditional medicine to be more user friendly and not alien to their traditional beliefs which results in defaulting treatment. The study found out that initiatives on improvement of ART adherence that do not acknowledge the existence of traditional medicine run the risk of treating symptoms rather than the underlying factors that lead to poor adherence. Therefore, the study recommends the encapsulation of traditional medicine in all initiatives that strives to improve ART adherence since traditional beliefs are dominant in rural communities.

Keywords: Anti-retroviral treatment, Traditional healer, Traditional medicine, HIV and AIDS, Adherence

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Since joining the University of Venda Faith Mary Musvipwa has been attached to the Sociology Department. Faith did a one year pre-Doctoral fellowship at the University of Virginia. She is currently doing her PhD in Sociology at the University of Venda. She also assists as a research assistant in the Community Engagement Directorate.

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APPLYING INDIGENOUS KNOWLEDGE SYSTEMS RELATED TO LOCAL INSECT RESOURCES FOR CONSERVATION EDUCATION IN SOUTH AFRICA AND JAPAN

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Dzerefos, CM, De Sousa, LO (North-West University, South Africa)

Researcher

Increasing populations, loss of biodiversity, malnutrition, diminishing agricultural resources and low economic growth are global environmental issues that should be addressed through education for sustainable development. In rural schools of South Africa and Japan, learners’ daily experiences are seldom used to highlight the international significance of the local environment. One such daily experience could relate to observations of insects in nature or collecting and eating insects with family and friends. South Africa and Japan have rich histories of using a variety of edible insects. Many of these insects are cultural delicacies even though they may have started as a famine food. In Japan the sustainable use and rearing of edible insects has been practiced for many years while in South Africa insects are solely wild harvested. This study aims to link teaching and learning about insects at schools with multi-generational knowledge transfer, ecotourism, sustainable harvesting and habitat conservation. We present examples from South Africa and Japan where teachers have used local experts on beneficial insects as well as introducing insects that are easy to rear as a teaching tool. The successes and challenges that arose in these case studies are discussed. The results suggest that insects increase children’s interest in following careers in conservation habitat, apiculture, entomology, mini-livestock farming or feed production as well as contributing to indigenous self-efficacy.

Keywords: Entomophagy, Environmental education, Food security, Practical learning, Sustainable practice

Biography:
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Dr Nonaka has been involved with studies related to cultural ecology as well as geography and ecological anthropology in interdisciplinary cultural studies since 2007. He has studied subsistence activity, regional resource use and environmental cognition, conducting fieldwork in Japan, Southern Africa, South-east Asia and Oceania.

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TAPPING INTO THE VALUE OF EDIBLE INSECTS FOR EDUCATION AND ECOTOURISM

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Student

Indigenous Knowledge Systems pertaining to beneficial insects have been developed by multiple generations in South Africa and Japan and are increasingly relevant today as a nutritional source of food and feed. The location, processing and sustainable management of insects constitute species specific learning about insects. We discuss the case study of the Yellow Jacket Wasp in Japan and how this can be used to develop the value of Mopane Worms in South Africa in education and ecotourism. Insects have potential for inquiry-based teaching and learning and can boost rural economies. There is considerable potential in widening the market for edible insects by incorporating it into ecotourism. Ecotourism has the added potential of reviving traditional cultures, developing rural livelihoods and contributing to sustainable management of insect habitats. We discuss ways to combine insects related to Indigenous Knowledge through the medium of cartoons, thereby bridging the gap between insect research and the classroom. Insects offer opportunities for practical activities in the classroom to increase children’s interests to follow careers in apiculture, entomology, mini livestock farming or feed production. We further discuss how Mopane Worms, being the top harvested insects, in the Kruger National Park can aid in being a link between ecotourism and entomophagy that can promote and educate visitors on entomophagy in South Africa.

Keywords: Ecotourism, Edible insects, Education, Entomophagy, Indigenous Knowledge Systems, Mopane Worms, Inquiry-based learning

Biography:

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Melissa Palmer has an Honours Degree in Environmental Education from the University of Johannesburg. She is working towards a Master’s Degree in Education in Curriculum Studies at North-West University. She is Head of Department for Natural Sciences at Spectrum Primary School.

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RELATIONSHIP BETWEEN INFANT FEEDING PRACTICES AND CAREGIVERS’ NUTRITION KNOWLEDGE ON THE NUTRITIONAL STATUS OF INFANTS

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Student

Poor infant feeding practices have been an endemic problem in sub-Saharan Africa and they emerge (in part) from the lack of nutrition knowledge of caregivers with effects on infant development. Multiple factors can cause infant malnutrition like poverty, food insecurity and drought, but this study looks specifically at the role that caregivers play in selecting food for the infants and feeding of the infants. This was a cross-sectional study conducted in a rural community in Zimbabwe. The respondents in this study included a sample of 100 caregivers with infants between the ages of 6 and 12 months. Anthropometric measurements (weight, height and Mid-Upper Arm Circumference (MUAC)) were collected. A validated infant and young child feeding module, socio-demographic and caregiver’s nutrition knowledge questionnaires were completed. The study results indicated the prevalence of stunting, overweight, wasting and underweight in the infants. The prevalence rate of stunting (54.5%) was higher than the national prevalence of 37%. Overweight prevalence (6.9%) was lower than the national prevalence of 12.5%. Underweight prevalence (32.7%) was higher than the national prevalence of 20.5%. Wasting prevalence (10.9%) was lower than the national prevalence of 16.5%. Only 21.8% of the caregivers were trained on infant nutrition and the majority (54.5%) of the infants consumed two meals a day. Although infant malnutrition emerges from multiple causes it is important to look at the role of caregivers. More attention needs to be given to the training of the caregivers on infant nutrition so that they understand the need for healthy infant feeding practices, especially considering that the first 2,000 days of infant life are the most critical.

Keywords: Caregiver, Infant feeding practices, Nutritional status, Nutrition knowledge

Biography:
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Lynn joined Durban University of Technology in 2017 and has been doing her research on infant nutrition where she is looking at some of the causes of malnutrition in the rural communities. She worked as a teacher at a rural school from 2013 and that is where her passion was born.

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Municipal Services Partnerships were inaugurated to add value and capacity to municipal service delivery processes. In South Africa such partnerships are not a relatively new ground for local municipalities. However, very little research has been done to reveal the effectiveness of Municipal Services Partnerships in rural municipalities of South Africa as these local authorities are incessantly overwhelmed with service delivery backlogs. This paper therefore seeks to reveal the extent to which Municipal Services Partnerships enhance service delivery, using a case study of Sekhukhune District Municipality in Limpopo Province of South Africa. Qualitative and quantitative data were collected through the Delphi technique (‘serious’ brainstorming) with five municipal officials from the service delivery department of Sekhukhune District Municipality; ninety-five household questionnaires; observations; as well as review of pertinent documents. Quantitative data was analysed through SPSS, whereas text description was used to analyse qualitative data. Healey (1998)’s collaborative theory was adopted to provide meaning to the role and effectiveness of the Municipal Services Partnerships in the district municipality. The research findings reveal that Municipal Services Partnerships in Sekhukhune District Municipality face challenges in actualizing its service delivery mandate flowing from internal and external drivers such as economics, institutional and rural-urban dynamics. The implementation of Municipal Services Partnerships however remains key to reducing service delivery backlogs. This in a way also helps local government to contribute to the efforts to achieve the objectives of the SDGs. More collaborations with local communities, the private sector and other government departments, as well as the adoption of appropriate strategies in service delivery, are critical to strengthening existing service delivery effort in the district municipality.

**Keywords:** Municipal Services Partnerships, Service delivery

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Kholofelo Radingoana is a registered professional planner. He worked as a town planner for Polokwane Municipality before joining Stellenbosch Municipality as a Land Use Inspector. He is currently doing his Master’s Degree in Urban and Regional Planning at Stellenbosch University.

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LESSON STUDY IN INITIAL TEACHER EDUCATION: THE CASE OF THE UNIVERSITY OF PRETORIA, SOUTH AFRICA

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Researcher

The Lesson Study is widely used as a teacher professional development model. Since its inception in Japan over decades ago, Lesson Study has gained prominence in numerous countries globally (Doig & Groves, 2011) and has evolved to suit the needs of the individual countries. It bolsters teacher collaboration to formulate and realize teaching and learning goals (Takahashi, 2016); plan a lesson; teach or observe the lesson; reflect on the gathered evidence; revise the lesson for improvement; and re-teach the revised lesson (Lewis, 2002). In South Africa its introduction in the Basic Education sector was made possible by the collaboration with Japan International Cooperation Agency (JICA). Although the Lesson Study gained significant prominence as an in-service teacher development model, it is yet to gain sufficient traction for initial teacher development. The Lesson Study initiative at the University of Pretoria (UP) seeks to enhance the quality of initial teacher development as well as in-service teacher development and bridge the gap between the two. This presentation aims to share: (1) the Lesson Study milestones achieved in the Basic Education sector; (2) the conceptual framework of the Lesson Study initiative at UP and how it permeates the undergraduate studies as well as post graduate studies; and (3) the recommended determinants for effective and meaningful implementation.

Keywords: Lesson Study, Initial teacher development

Biography:
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Since joining the University of Pretoria, David has been involved in the conceptualization, inception and implementation of the Lesson Study initiative as it pertains to initial teacher education (for more information: www.up.ac.za/lesson-study). Before joining the University of Pretoria, David worked in the Department of Basic Education (DBE) in South Africa as a Chief Education Specialist tasked with the development, implementation and monitoring of the Mathematics curriculum for primary schools. During his tenure as a subject specialist at the DBE, David coordinated the conceptualization, introduction and implementation of the Lesson Study in four provinces (public schools) in collaboration with JICA. David is currently working as a researcher and teacher educator in the Faculty of Education, University of Pretoria.

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The Infectious Diseases Early Warning System (iDEWS) programme is a SATREPS project, co-funded by JICA, AMED and the South African Department of Science and Technology. The collaboration among the Japanese research institutions and a South African consortium, led by the ACCESS programme, has recently completed a research project focused on the Limpopo Province in South Africa with the goal of developing a climate-based iDEWS for the province. The aim of the iDEWS is to apply climate models and disease incidence data in combined infectious disease prediction models at time scales that will enable proactive interventions to suppress or avoid predicted infectious disease outbreaks. The project has focused on three diseases, namely malaria (which is endemic in Limpopo and surrounding northern provinces and neighbouring states), diarrhoeal diseases and pneumonia (which are prevalent in the entire country and beyond), which are leading causes of mortality and morbidity among children and the elderly. These diseases’ incidence varies from season to season and from year to year (inter-annually) and are sensitive to the variability inherent in regional climate. Using global models and downscaled model products, seasonal scale climate prediction is used to drive data assimilating models that can be used to predict the likelihood of an outbreak of these diseases at time ranges of months to weeks ahead. Three different models for malaria are operationally ready for application and predictions of diarrheal disease incidence severity can be estimated. The project has produced several novel products and several other academic outcomes and plans are currently underway to establish an iDEWS Bureau which will be hosted at the National Institute of Communicable Diseases and which will be mandated to use the project outputs to produce iDEWS Outlook Reports and to conduct further research on other climate-sensitive diseases and in other regions in Southern Africa.

**Keywords:** Infectious diseases, Climate, Prediction, Public health

**Biography:**
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Dr Sweijd is originally a marine scientist with a background in molecular genetics and has led several regional and national research programmes. He has become involved in the strategic development of earth systems science programmes and is co-leader of the iDEWS project hosted by the ACCESS programme in South Africa.

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Helicobacter pylori (Hp), a Gram-negative bacterium, is etiologically associated to a wide spectrum of gastroduodenal diseases including chronic gastritis, peptic ulcers and gastric cancer. By infecting half of living people worldwide, Hp constitutes a worldwide Public Health issue. Africa likely play a central role in the global epidemiology of Hp as evidences for the highest prevalence, the geographic origin and the widest genetic diversification of the species exist in this continent. However the continent is still not explored enough and is surrounded by enigma regarding the Hp infection (e.g. so-called “African Enigma”; high Hp infection, but low gastric cancer incidence). The current project had been developed in 2017 to empower cross-border multidisciplinary collaboration between scientists in Japan and in Africa, by fueling research works related to Hp and gastric cancer with interaction through a scientific Network. The project has been granted for 3-years (2017, 2018, and 2019) by the Japan Society for Promotion of Science (JSPS). Currently, a Network is underbuilding and is already connecting five African countries (Kenya, DR Congo, Rwanda, Nigeria and Cameroon) to Japan. Works under this Network has led to field surveys, training for African researchers in Japan and Joint-Meetings between countries. However, further efforts are still needed to finish addressing several challenges such as heavy procedures for material exchanges, sustainable capacity building for fellows and researchers, and high quality scientific production. Nevertheless, current progress allows us to hope that on a mutual basis, this project will serve as a momentum to hasten further developments for establishing strong inter-institutional partnerships and building valuable human resources. This is needed for the continuation of the joint effort in harnessing the vast potential of research for improving human well-being through a good understanding of the gastroduodenal diseases burden useful for efficient allocation of public health efforts in Africa.

Keywords: Helicobacter pylori, Epidemiology, Gastric cancer, African enigma, Scientific network

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Since joining Oita University in 2009, Dr Yamaoka he has Yamaoka has worked as a director of GO-MARCH. He is also Professor in the Department of Medicine at Baylor College of Medicine USA since 2010.

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This paper unpacks the implications of recent AI developments for learning and intelligence. As AI technology develops, AI has learned faster, exhibits increasingly intelligent behaviors and has outperformed humans in a number of traditionally considered intelligence intensive tasks (including games such as chess, Go and poker). However, two questions remain. One is whether the current AI development, advanced rapidly since deep learning became the widely accepted primary AI development technique, helps humans to unpack the notion and underlying mechanism of learning and intelligence. Reviewing literature on learning types and theory, intelligence definition and core features, AI development and methods (particularly the spectacular 2017 AlphaGo Zero’s victory over its predecessor all by learning itself), this paper argues that deep learning primarily simulates implicit learning through trial, error and feedbacks. This method produces better performing and more intelligent AI but will not automatically lead to better understand of the learning mechanisms and unpack the human intelligence black box. The second implication centers on current AI achievements that largely concentrate on specialized but not general tasks. This paper discusses AI advantages in specific intelligence tasks in relation to the current human learning trajectory, which also tends to progress from generalization towards greater specialization. The paper argues that the value of such increasing specialization will diminish in the age of AI and therefore requires humans to re-structure human learning pathways.

Keywords: AI, Intelligence, Learning, Deep learning, Specialization

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MOBILITY WITH VULNERABILITY OF MOZAMBIAN FEMALE MIGRANTS TO SOUTH AFRICA: OUTFLOW FROM THE PERIPHERY

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During the last two decades, a new wave of migration has arisen in the globalized world, and intimacy has also arisen between transnationalism theory in migration studies and development discourses. Development policy expected migrants to contribute to poverty reduction by transfer; this expectation is included in the Millennium Development Goals and the Sustainable Development Goals (SDGs). However, an evaluation of new migration's positive impact comes without considering the socioeconomic circumstances that generated it. Why have more women begun to migrate? Is the feminization phenomenon continuous, temporary or phasic? Are women's activities sustainable in contributing to poverty reduction, as the SDGs expect? Aiming to answer those questions, this study focused on Mozambican female migrants with high mobility, as categorized into two types: first, informal cross-border traders (ICBT) who travel to Eswatini, South Africa, and sometimes China and India, and second, informal workers "based" in South Africa. The study applied qualitative research based on fieldwork conducted in a migrant sending area in southern Mozambique and in some receiving South African cities. Results showed only a narrow path, especially for women, into Mozambican formal economy under resource-driven "economic growth without job creation" in the 2010s and after. Feminization of capital-based ICBT seems phasic because men have joined since the 1990s, after discovering good profit margins. Indeed, in this men are becoming dominant, while female traders still dominate provincial ICBT. The feminization of provincial informal workers from areas that historically sent male migrants to South Africa as miners indicates the necessity of supplementing household income after official labor migration for mining began to shrink.

Keywords: Informal sector, Migration, Cross-border, Feminization, Poverty, Transnationalism

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During the last two decades, a new wave of migration has arisen in the globalized world, and intimacy has also arisen between transnationalism theory in migration studies and development discourses. Development policy expected migrants to contribute to poverty reduction by transfer; this expectation is included in the Millennium Development Goals and the Sustainable Development Goals (SDGs). However, an evaluation of new migration’s positive impact comes without considering the socioeconomic circumstances that generated it. Why have more women begun to migrate? Is the feminization phenomenon continuous, temporary or phasic? Are women’s activities sustainable in contributing to poverty reduction, as the SDGs expect? Aiming to answer those questions, this study focused on Mozambican female migrants with high mobility, as categorized into two types: first, informal cross-border traders (ICBT) who travel to Eswatini, South Africa, and sometimes China and India, and second, informal workers “based” in South Africa. The study applied qualitative research based on fieldwork conducted in a migrant sending area in southern Mozambique and in some receiving South African cities. Results showed only a narrow path, especially for women, into Mozambican formal economy under resource-driven “economic growth without job creation” in the 2010s and after. Feminization of capital-based ICBT seems phasic because men have joined since the 1990s, after discovering good profit margins. Indeed, in this men are becoming dominant, while female traders still dominate provincial ICBT. The feminization of provincial informal workers from areas that historically sent male migrants to South Africa as miners indicates the necessity of supplementing household income after official labor migration for mining began to shrink.

**Keywords:** Informal sector, Migration, Cross-border, Feminization, Poverty, Transnationalism

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The scientific narrative on planetary limits is on a collision course with the socio-political narrative of personal identity, -values and -freedom. National populism is a pervasive movement that pushes towards the national and local, while the idea of planetary governance extends and supports the idea of universality of reason towards the global scale. The implications of this battlefield between populism and the planet are uncertain. Given that the most important risks to the social order are disproportionately environmental in nature, it is critical that a governance discourse is developed that acknowledges the value of the personal as well as the well-being of the planet. This contribution will use insights from political philosophy, environmental governance theory and economic approaches to environmental governance to seek for fruitful strategies of engagement between seemingly irreconcilable and opposing forces. The tensions between the universal and the particular as well as the interaction between human dignity and freedom and broader systems are used as organizing frameworks for a critical reflection. The paper attempts to chart a way forward that (i) addresses the excesses of a globalized system of liberalism and autonomous human freedom and (ii) accepts the importance of personal identity and values, as well as natural and social limits at various levels. The paper concludes very tentatively with some thoughts on what such a narrative may look like.

**Keywords:** Environmental governance, Planetary limits, Personal values, Personal identity

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Martin joined the School of Public Leadership at the end of 2016. His current research is focused on the place of persons in the field of environmental governance. Most of his prior work was on the application of an economic approach to environmental management. In the three years before joining Stellenbosch University, Martin finalized a Master’s Degree in Theological Studies at Regent College, Vancouver, Canada.

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In pharmaceuticals and fine chemicals processes various organic solvents (OS) such as acetone and heptane are released. In Japan, 20% of the used solvent amount is recycled, although CO₂ due to incineration of the rest of OS is the issue. Therefore membrane separation is considered promising for reducing CO₂ emission in terms of energy efficiency. Nevertheless, the organic membranes swell by absorbing the organic solvent. Inorganic membranes would be preferred for the separation of OS, although there are few reports on the separation of OS. In this paper, the permeation performance of several kinds of OS through zeolite membranes was evaluated using the method of nonequilibrium molecular dynamics (MD). The permselectivity in the reverse osmosis (RO) and pervaporation (PV) was theoretically evaluated and compared. We calculated them using in-house MD code. A zeolite membrane of NaY type was placed in the center of the unit cell imposed periodic boundary conditions and the solvent and solution phases were placed across the membrane. Consequently, a high separation factor was obtained for ethanol / cyclohexane (Chx) mixture, while in benzene / Chx mixture, however, only low separation factor was obtained when RO was applied. It was suggested that the species with high diffusivity can be separated, and separation would be difficult for the species having low diffusivity due to their strong concentration dependency of diffusivity which is the feature of conventional zeolite membranes. Therefore, OS with high diffusivity species in zeolite membrane is considered promising separation objectives. In the presentation, we discuss a type of separable solvents when zeolite membranes are applied in terms of their diffusion and adsorption properties.

Keywords: Zeolite-Y, Polar / Non-polar Organic Solvent, Alcohol, Molecular Dynamics

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Mr Higuchi completed his Bachelor’s Degree in Engineering at Kogakuin University in Japan in 2017 and his Master’s Degree in 2019. He is now a PhD candidate at Kogakuin University. His main research field is the application of computational chemistry to materials design, in particular, in the membrane separation processes.

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LEARNING FROM SITUATEDNESS OF INDIGENOUS KNOWLEDGE: FROM CASE STUDIES IN FISHING REGIONS IN JAPAN

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Indigenous knowledge accumulated through daily subsistence practice in nature has great potential in education in multi-cultural settings and for empowerment of the socially marginalized. Participatory development project also encourages identification and involvement of the knowledge in education. However, situated knowledge framework calls for attention in order to discuss constraints as well as prospects in applying indigenous knowledge in physical and social study education. This paper shows ecological knowledge employed by woman fishers in Japan, and argues how the knowledge is situated geographically in coastal regions. In rural Japan, intertidal areas of the coasts are used for gleaning sea weeds, shellfish, and other benthic resources. Women are active gleaners in many regions, and their labor have been historically situated in family, village, and market. Woman divers have collected abalone for market for centuries, and they develop navigation skills through operation as major income earners. They are often active advocates for protection of coastal environment. On the other hand, the subsistence gleaners, who once legitimate resource users, are marginalized as the commercial fishers organized the cooperative and entitled with exclusive fishing right. Spatial gap between the gleaners and the cooperative members became significant as the modern commercial fishers extended their fishing grounds. In Okinawa Island, historical promotion of agriculture and land degradation not only affect coastal environment but also situated their knowledge in “domestic” position. The ecological knowledge differs greatly by generation for rapid environmental and social changes. Learning from their knowledge should give local biophysical understandings. And learning their knowledge as the situated knowledge should play important role in social studies and understanding of others.

Keywords: Indigenous Knowledge, Fisher, Gender, Coastal environment, Education

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LEARNING FROM SITUATEDNESS OF INDIGENOUS KNOWLEDGE: FROM CASE STUDIES IN FISHING REGIONS IN JAPAN

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Indigenous knowledge accumulated through daily subsistence practice in nature has great potential in education in multi-cultural settings and for empowerment of the socially marginalized. Participatory development project also encourages identification and involvement of the knowledge in education. However, situated knowledge framework calls for attention in order to discuss constraints as well as prospects in applying indigenous knowledge in physical and social study education. This paper shows ecological knowledge employed by woman fishers in Japan, and argues how the knowledge is situated geographically in coastal regions. In rural Japan, intertidal areas of the coasts are used for gleaning sea weeds, shellfish, and other benthic resources. Women are active gleaners in many regions, and their labor have been historically situated in family, village, and market. Woman divers have collected abalone for market for centuries, and they develop navigation skills through operation as major income earners. They are often active advocates for protection of coastal environment. On the other hand, the subsistence gleaners, who once legitimate resource users, are marginalized as the commercial fishers organized the cooperative and entitled with exclusive fishing right. Spatial gap between the gleaners and the cooperative members became significant as the modern commercial fishers extended their fishing grounds. In Okinawa Island, historical promotion of agriculture and land degradation not only affect coastal environment but also situated their knowledge in “domestic” position. The ecological knowledge differs greatly by generation for rapid environmental and social changes. Learning from their knowledge should give local biophysical understandings. And learning their knowledge as the situated knowledge should play important role in social studies and understanding of others.

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SDGS BOOMING IN JAPANESE BIG BUSINESSES: CAN “SDGS” CHANGE THEIR STRATEGIES AND PERSPECTIVES?

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At the beginning of 2016, when the SDGs started, Japan was very slow to acknowledge the importance of SDGs. Nobody knows and nobody cares. However, as of early 2019, everyone knows and everyone talks about SDGs in Japan’s big business. Almost all of the presidents and CEOs of Japanese big companies are not only aware of the SDGs, but they are rushing to wear SDGs pins to show their commitments to the public. What happened? The paper describes the efforts to push SDGs to mainstream Japan business. The presenter has served as a member of SDG Task Force group of Global Compact Network Japan since 2015 till now, and also as Chair of the Japan Global Compact Academic Network. As an insider of the SDG movement in Japanese business, she describes the history and issues of Japanese business in terms of SDGs. Where will Japanese business go in the SDG environment? And what are the implications for Africa and African business? This is a piece of an action research of contemporary Japanese business.

Keywords: SDGs, UN Global Compact, Japanese business, Strategic management, Sustainable development

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Dr Iizuka obtained her MBA and MA (in Development Economics) from Stanford University and her PhD from Kyoto University. After a stint at the World Bank in Washington DC working on projects for Africa, she founded Global MBA program in Kyoto, Japan, where students from all over the world study. She researches Mindfulness and SDGs, and heads the Japan Global Compact Academic Network as well as the Well-being Research Center.

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Despite US President Trump's decision not to join the Trans-Pacific Partnership agreement (TPP), the Comprehensive and Progressive Agreement for Trans-Pacific (CPTPP) that the 11 remaining member countries have agreed to get the deal back on track and entered in force. Meanwhile, the US has been embroiled in a tit-for-tat trade battle and threatened to withdraw from the free trade deal. While the door will be kept open for the US to rejoin the pact, they have discussed how they will associate with China. Though China has never said it wants to join either the TPP or the CPTPP, it seems to fill up a predicted American vacuum in global trade. The One Belt One Road initiative launched by China has received worldwide attention if China might take the place of the United States or not. While Japan is not a member of the Asia Infrastructure Investment Bank (AIIB), it has expressed readiness to take an initiative for the regional economic order including CPTPP, Asia Development Bank (ADB) and so on. Can Japan win an advantage from the terrible conflict between the US and China? Nobody knows which country is leading the trade deals on either regional or world level. China, the US and Japan may be candidates of regional hegemony in the Asia Pacific at the same time as being afraid of being losers in the economic competition. In order to win in the global economic competition, those countries have undertaken another way, dominating ISO standard in various fields, to occupy a higher ratio of the global market. What kind of expectations and strategies for the ISO standard setting process have been observed? The paper will discuss the economic cooperation and competition on global standard in the Asia Pacific, focusing on China, Japan and the US.

**Keywords:** Global governance, ISO standard, Regionalism, Asia Pacific, CPTPP

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Dr Kabashima is a political scientist and has been working on regional governance in the Asia Pacific since joining Yokohama National University in 2003. Kabashima is in charge of international affairs at the university as well. She was a visiting scholar at Monash University in Australia, University of Warwick in the UK, and the East-West Center in the US.

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This paper examines how the public discourse on immigration in South Africa has been shaped in recent years, particularly in the context of increasing political competition prior to the 2019 general elections. Despite the progressive constitutional framework that was adopted in the period immediately following the political transition, the protection and realisation of the rights of refugees, asylum seekers and migrants have been hampered in many ways in South Africa. The gap between progressive policy and its implementation is due in part to a lack of government capacity, yet many scholars argue that the gap is also related to strong and widespread anti-immigration sentiment that exists across South Africa, including among its public officials and policymakers. Recent policy documents, such as the ‘White Paper on International Migration’ in 2017, clearly show that the government wants stricter migration control, with more emphasis on national interests and security than human rights. Even though migration policy was never a central issue in the previous elections, both the governing and opposition parties are currently employing discourse that politicises immigration issues as the general elections approach, particularly in the Gauteng Province where electoral contestation is highest and the immigrant population most concentrated. By examining government documents, public speeches by political leaders and election manifestos of major political parties, this paper will argue that, although xenophobia in South Africa tends to be explained primarily by socio-economic factors such as massive unemployment and poverty, it is also deeply connected to post-apartheid national distributional politics.

**Keywords:** Immigration, General elections, Distributional politics, South Africa

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Since joining the IDE, Kumiko has conducted various research projects mainly related to politics of social policy in post-apartheid South Africa, as well as the history of Japanese citizens’ engagement in anti-apartheid activism. She is currently based at Wits School of Governance as a visiting research fellow.

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This paper sought to interrogate the position that Zimbabwean youth are politically apathetic as is seemingly substantiated by voter registration and electoral participation since the turn of the millennium, and youth membership in political parties as well as voluntary organisations. In terms of non-electoral political participation there also seems to be strong apathy among the youth. Youths do not engage in activities such as protests, demonstrations and attending political party meetings. Given the above background, the study was twofold. It sought to investigate the root causes that prevent the youth from participating in elections, and to establish whether they indeed engage in other forms of political participation. Specific issues to be addressed included the desire to establish the youth’s interest in politics, their perspectives on political engagement, whether the youth feel excluded from political party organisations, whether they have confidence in the electoral process and explanations for participation in elections. The analytical framework for this study drew on three models of political participation namely: the Socio-Economic Status (SES) model, Rational Choice theory, and the Civic Voluntarism model.

Keywords: Youth, Politics, Participation, Elections

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This paper discusses an entrenched African condition that I term ‘the waiting politics’ and examine it around forested spaces in Southern Africa that have wider implications for understanding why open rebellion against hegemonic forces is rarely witnessed. Based on over twenty years of work in Zimbabwe and South Africa, the book engages with the vexed issues around property, rights and access and the attendant claims and counter claims by different actors in seeking legitimacy, emancipation about their battles over forests, land and resources. I go into the unresolved politics of dispossession, both material and symbolic, and the fraught post-colonial state-making that are embedded within rights and access to property in conservation areas. I locate these battles over nature in what I term waiting politics in conservation within dispossession, coloniality embedded in state hegemony over rights and access. State initiatives in conservation tend to offer either rights or access to neighbouring communities as a solution to existing conflicts and demands, instead of both. In so doing the post-colonial state fails local people by not restoring their property, rights and access around forests. What happens when local people tire of patiently waiting for their rights to be restored by post-colonial African states who have failed in transforming property dispensations around protected areas, forests, parks, nature reserves is the focus of this book. Through this approach, the book analyses the ‘waiting’ politics of marginalised people as they seek to restore their rights and access to property.

Keywords: Waiting politics, Local people, Forest conservation

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Frank is an environmental sociologist at the University of Cape Town. His research interests are the political economy of conservation and natural resources in Africa. He is currently preparing a monograph entitled “Beyond Waiting Politics in Conservation: Forests and the power of the marginalised in Southern Africa”.

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“DOING” THE 4.0 INDUSTRIAL REVOLUTION IN THE SOUTH AFRICAN WORKPLACE WHILE RECOGNISING THE SOCIO-POLITICAL AND ECONOMIC CHALLENGES OF THE PAST

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The Fourth Industrial Revolution has been brewing for some time now in the global world. The history of industrial revolution is often criticised for ignoring the voices of the ‘less powerful’ actors in society. The obvious emergence of technology in South African organizations poses a question between organizational effectiveness and increasing unemployment in a country severely lacking in skills, and riddled with the socio-economic and political past inequalities that affected the relationship between employer and employee and the psychology of the workplace. In this paper, we view the workplace as a microcosm of the broader society, we critically engage with the socio-economic and political changes and challenges of South African society, both pre-1994 and post-1994. We then ask the following questions. With so many millions of people who are unemployed, unskilled and under-developed, how will the 4.0 Industrialisation empower these groups, especially if ‘employment’ and work remain key government strategies to eliminate socio-economic inequalities in South Africa? To what extent could we speak of Person-Environment Fit theory in the dawn of 4.0 Industrialisation? In other words, how will a technologically advanced workplace integrate rural communities who, due to their location historically (in former Bantustans), were cut out from the mainstream economic development of South Africa? How will a society with high levels of economic inequality that are exacerbated by ‘normalised’ organisational behaviour and practices (such as high pay for executives and low pay for lower-level staff) be reflected in the age of 4.0 Industrialisation. Already, the minute forms of technology (e.g. robotics in car manufacturing companies) that have been introduced have made certain skills obsolete. We ask: what is the attitude of South African workers to the possibility of the 4.0 Industrialisation deskilling them—and how will such be affected by race, class, gender and culture?

Keywords: 4.0 Industrialisation, history of industrial revolution, South Africa, Skills, Unemployed, Socio-economic and political changes, Inequalities, Person-Environment Fit

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RECONSIDERING “INCLUSIVE GROWTH” AND GENDERED ECONOMIC SECURITY: TOWARD CONSTRUCTING COMPARATIVE RESEARCH AGENDAS

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Inclusive growth is considered significant for achieving “rapid and sustained poverty reduction” (World Bank, 2009). As the expansion of the global economy has progressed, “poverty reduction” is a challenge not only for developing countries but for socially and economically vulnerable segments of any society in emerging economies and developed countries. The concept of “inclusive” highlights the importance of women as labor force. The review of literature on economic growth indicates the presence of a co-relationship between economic growth and women’s employment. Women’s labor participation rate is one of the important indicators of women’s employment. Despite governments’ efforts to increase women’s labor participation rate in the Middle East and North Africa in the past decade, the region remains at 18%, the lowest in the world. This paper analyzes government policies and examines what structural constraints determined the failure of their policies through the case studies of Saudi Arabia and Iran. The methodology employed in this study is the critical review of the secondary sources relevant to the policies of the two governments. Some primary sources are utilized for the analysis of the case study of Iran. By so doing, this study attempts to address research agendas for the comparative study of women’s participation in the labor market as well as the concept of gendered economic security from the perspective of freedom to live in dignity, one of the three pillars of human security.

Keywords: Inclusive growth, Gender, Women’s employment, Freedom to live in dignity

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Hisae obtained her PhD in History at UCLA in 1994. Since joining Doshisha University, she has been involved in research on conflict mitigation in the Middle East, and gender and development. She worked for the Japan Commission for UNESCO from 2005 to 2011. She was Professor of the Graduate School of International Development at Nagoya University from 2001 to 2010 and Dean from 2004 to 2006.

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The World Bank estimates 20 percent of the world’s poorest people to be made up of disabled people. This is steadily increasing due to the increase in average life span and elderly people. The two way link between poverty and disability continues to cause a vicious cycle, as they continue to face legislative, information, communication and physical barriers. This limits participation and empowerment of disabled people on an equal basis with others. This study is concerned with evaluating economic empowerment of persons with disabilities in Japan and South Africa. One of the common intervention methods to promote economic empowerment of disabled people has been quota legislation or systems, which exist in a number of countries including Japan and South Africa. The Global Status Report on Disability and Development shows that on a global scale, the SDGs also set a target of employing 8.5 percent of persons with disabilities by 2030. Reporting based on the quota system only addresses participation, however this increase in the number of persons who are employed, though a success indicator, may not be sufficient to convince one of improved well-being and empowerment, especially when there is evidence that suggests that disabled people are likely to have vulnerable or lower paying work. In assessing economic empowerment of persons with disabilities, we draw from the fundamentals of Amartya Sen’s Capability Approach, setting the conditions for economic empowerment to be dependent on the ability to advance economically, the power to make and act on economic decisions in an enabling environment. The study evaluates economic empowerment of disabled people against their counterparts, using in-depth structured interviews with employed disabled Japanese and South Africans and their respective counterparts, thereby qualitatively analyzing their responses, case selection and case analysis.

**Keywords:** Disability, Empowerment, Power, Agency, Economic advancement

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With a background in Economics, Ms Nzo has worked in local economic development, resource mobilisation and stakeholder liaison positions. An injury which left her paralysed birthed her interest in social transformation and inclusion. She worked as senior disability equality facilitator and undertook other voluntary advocacy work while serving on various government and NPO committees aimed at promoting inclusion.

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The purpose of the argumentative article is to explore how indigenous ways of thinking can support education for sustainable development. Western science searches for knowledge of universal significance that is not always context-related, whilst indigenous knowledge systems are a social product closely linked to a cultural and environmental context. In South Africa, the school curriculum is modelled on a Western discourse depending heavily on different international contexts, whilst a large number of the population of South Africa still relies on indigenous knowledge. Complex environmental and sustainability problems tend to transcend the jurisdictions and capacities of any single knowledge system. To reap the benefit of different ways of knowing there must be room made in education to explore the intersection of the Western and indigenous domains. In Japan, indigenous Shinto religion is considered as one of the fundamental concepts to understand the relationships between the living, material and spiritual matters in our world. It can be characterized as an integrated system of cognition, belief and practice. The Japanese system’s thinking and holistic approach to the environment simultaneously include modern western scientific methods as well as indigenous knowledge. This approach can be the gateway to education that includes biodiversity stewardship and adaptive management in order to secure sustainable development. Lessons that can be learnt from Japan is that education must be relational, respectful, ethical, spiritual and responsive learning. The Lesson Study approach in Japan is a good example of how to support quality education and sustainability, one of the Sustainable Development Goals set by UNESCO. It is suggested that a holistic systems approach can be used to include different knowledge systems to open opportunities to better understand sustainability teaching and learning.

Keywords: Indigenous knowledge systems, Education for sustainable development, Systems thinking

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ENERGY SECURITY AND CHALLENGES OF TRANSITION TO GREEN ECONOMY IN SOUTH AFRICA

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Researcher

South Africa faces two almost conflicting challenges at the same time: resolving pervasive energy poverty and reducing greenhouse gas emissions. On the one hand, more and more poor people struggle to secure their daily access to energy. On the other hand, the country’s economy is one of the most carbon intensive in the world, which is totally unsustainable. Thus, encouraging the use of renewable energy is particularly important as this clean energy will help transition to a low-carbon economy. This article examines two examples in this context: 1) the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) which is intended to provide clean energy to grid-connected users; and 2) the iShack project that is intended to provide small-scale renewable energy for low-income residents who are not connected to the electricity grid. This examination reveals that although these two examples are distinct, analytically the examples inform us of important implications as to how we can conceptualize the notion of agency, which is essential to consider social justice in our world. While residents in informal settlements welcome initiatives such as iShack as a temporary measure, they still prefer to have more a permanent solution by being connected to a reliable electricity grid. Their preference is influenced by the government policy of free electricity provision as well. Thus, what is crucial is more coherent policy formulation encompassing both on- and off-grid users. Such coherence is indeed much needed as the role of the state is changing in this ever-warming world. Overcoming the negative legacies of the “minerals-energy complex” that originated during the apartheid era may only become possible with such policy cohesion.

Keywords: South Africa, Energy security, Renewable energy, REIPPPP, iShack, Minerals-energy complex

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PRECARIOUS LIVELIHOODS AND CHANGING GENDER RELATIONSHIP AMONG CONGOLESE FEMALE MIGRANTS IN SOUTH AFRICA

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Since the early 1990s when the end of apartheid was in sight, South Africa became one of the more favourable destinations for migrants and asylum seekers from Zaire (now the Democratic Republic of Congo - DRC). The persistent political instability, two wars and the associated economic crises of the 1990s and beyond forced or prompted many Congolese to move to South Africa. Many of them have settled in the inner city neighbourhoods of Johannesburg where foreign migrants have carved out their living spaces. While the influx of foreign migrants has often been seen negatively as a source of heightened social tensions and resulting xenophobic violence in South Africa, little is known about the migrants themselves and how they have survived in the country. This is especially the case for female migrants who tend to be less visible than male migrants, in spite of the fact that more than 60% of Congolese migrants in South Africa are now women according to an estimate by the United Nations Department of Economic and Social Affairs in 2017. Based on semi-structured, face to face interviews with 35 female and 10 male Congolese migrants in Johannesburg in 2018, this paper explores the livelihood activities of Congolese female migrants, their reasons for living in Johannesburg and their future plans. It also discusses whether and how their relationships with male partners have changed since they moved to South Africa, in order to examine the impact of migration on their gender consciousness.

**Keywords:** Congolese female migrants, South Africa, Livelihood, Gender consciousness

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Dr Chizuko belongs to the African Studies Group at IDE-JETRO and researches a wide range of topics related to South African politics and society. Her current research interests include land reform, small-scale farming and international migration. She was visiting researcher at PLAAS, the University of the Western Cape, in 2013-2014.

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This paper aims at introducing the concept of everydayness into the discourse of security and international relations. Ever since the introduction of such approaches of human development and human security in the 1990s, political discourses focusing on human beings as the main concern of inquiry have gained momentum. However, newly emerging theories of focusing on the non-Western regions do not seem to follow the trend. This is because of the dichotomized perception of the world on the basis of West/non-West has its ascendancy over theoretical construction. This paper strives to criticize this tendency embedded in the discourse of the non-West and to find a possible alternative source for a theory transcending the limit of the current non-Western IR theories. In so doing, it introduces the socio-political argument of the Kyoto School of philosophers, particularly Tosaka Jun, which hopefully illuminates the possibility of improving social justice in the non-Western regions.

**Keywords:** Post-Western theory, Kyoto School, Philosophy, Morality, Inter-war period

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Since 2011 academics at the University of the Free State in South Africa and Osaka University in Japan have been cooperating in promoting human security in the Southern African region, facilitating dialogue between academics and policy makers in an endeavour to promote peace in its widest sense and conflict resolution. Whilst initially focused on academics at these two institutions (through a Memorandum of Understanding), the cooperation broadened to include academics and policy makers from other countries in the Southern African Development Community (SADC) region. These included the University of Zambia, Zambian Open University and Mozambique-Tanzania Centre for Foreign Relations. Whilst initial funding for the conference emanated from the Japan Society for the Promotion of Science (JSPS), funding for the initiative has now been sourced within the Southern African region itself. Whilst initially focusing on conferences and staff and student exchanges, the cooperation has now expanded into Visiting Professorships, the establishment of a dedicated peace centre, joint supervision of postgraduate degrees as well as a journal. This presentation reflects on this cooperation – its modalities, its successes and its challenges.

**Keywords:** Peace, Security, Southern Africa, Osaka University, University of the Free State

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Prof. Solomon specializes in peace and conflict on the African continent. His most recent books include co-authoring “African Security in the Twenty-First Century” (Manchester University Press, 2018) and “Understanding Boko Haram” (Routledge, 2017). He is also Visiting Professor at Osaka University in Japan.

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RESOURCES MANAGEMENT AND POLITICAL POWER IN RURAL AFRICA

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Sakai, M, Oishi, T, Matsunami, Y, Kirikoshi, H (University of African Studies, Japan)

Sato, C, Aminaka, A (IDE-JETRO, Japan)

Researcher

Importance of resource management in rural Africa cannot be exaggerated, as it has seen increasingly severe constraints of various resources in the context of rapid population growth. Designing ways for their proper and effective management is one of the most important agendas for sustainable development. This ongoing research project examines policies and practices of resource management in rural Africa by focusing on the roles of political power including states, traditional authorities, donors and multinational companies. Strongly influenced by the seminal work of Ostrom, studies on rural resource management have mainly focused on communities, whose structures and functions with regard to resource management have attracted considerable attention. However, analyses of political power relating to such communities have been relatively scarce. This project explores the complex relations between political actors and resource management in several African countries including South Africa, Mozambique, Rwanda, Cameroon and Ghana, thus contributing to designing effective policies for resource management in Africa. Being composed of members with their main background in political economy and anthropology, the research team places the emphasis on case studies through fieldwork. On the basis of regular meetings, the project members deliver results in the form of working papers, journal articles and books.

Keywords: Land, Resource, Power, Rural, Politics, Africa

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Shinichi Takeuchi has carried out research at IDE-JETRO on political economy in Central African countries including Rwanda, Burundi, and DRC. In April 2017, he joined TUFS to establish the African Studies Center. His academic interests cover such topics as conflict, peace-building and land issues.

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CITIZEN PARTICIPATION, SOCIAL EXCLUSION, AND INSECURITY – AN EXAMINATION OF PARTICIPATORY SYSTEMS IN LOCAL GOVERNMENT IN SOUTH AFRICA

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Researcher

The need for citizen participation in state governance systems has been raised to a first order principle in orthodox development discourse in recent decades. Giving voice to the marginalised, it is maintained, promotes social inclusion and increases their access to public goods. However, numerous studies have exposed the ineffectiveness of participatory systems in developing states and the fact that they frequently lead to further disempowerment and isolation of the poor. Further literature has focused on how disaffected citizens mobilise to actualise their right to basic social services and has illustrated how the repeated failure of formal participatory structures to deliver favourable welfare outcomes frequently gives rise to frustration, anger and ultimately to protest action. Missing in much of the literature is a discussion of why, despite a commitment in legislation and policy, there is such a disjuncture between citizen expectations and the capacity or willingness of the state, and the local state in particular, to deliver services which will lead to greater social inclusion. Based on a qualitative investigation of selected municipalities, this paper looks at local service delivery in South Africa and the systems in place to promote public participation and greater social inclusion. It is argued that far from promoting social inclusion, participatory processes frequently serve to further isolate the poor and marginalised. This, in turn, has led to widespread public dissatisfaction, to a proliferation of protest action, and to the rise of populist movements seeking to capitalise on the growing social disorder.

Keywords: Citizen participation, Social exclusion, Protest, Local government, South Africa

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Chris Tapscott is an Emeritus Professor and former Director of the School of Government at the University of the Western Cape in South Africa. A sociologist, he has undertaken extensive research on issues relating to citizenship, participatory democracy and social exclusion, social movements, and the limitations of the local state.

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The paper examines the socio-demographic conditions of the elderly (60 and above) in Africa and, in current and long terms, some of the major implications for social protection. A social prognosis is undertaken to assess the multifaceted vulnerability that aged people face in most countries with deficits in social protection. Viewed from the perspective of demographic change, ageing is a global process as it affects invariably industrialised and less developed nations such those in Africa. This process comes with new forms of consumerism and economic production within this category of persons. Guided by the active ageing theory, various sources of data are utilised to provide empirical information on the living conditions under which the aged persons sustain their lives. The results of the analyses reported in the paper bring out different forms of vulnerability at play (economic, functional capacity, and structural). The ageing of the population is marked by an upward trend, with a more pronounced one for females. Old people do not automatically withdraw from the labour market. Increasingly they live alone, an indication of the shrinking role of the family in providing welfare. Across Africa, there is little impact of contributory pension schemes and other forms of transfers on improving the living conditions of the elderly. Intra-household relations continue to provide support to the elderly, the persistent impoverishment of the African population (especially the age working strata). It is even observed from data, a reverse trend whereby support is being given by the elderly. The considerable rate of home renting, though variable across countries, suggests vulnerability in the housing market as well, which may be accentuated by poor conditions. These observations on the dynamics of the ageing population suggest an insightful consideration of the implications for responsive social protection instruments in Africa.

Keywords: Demographic transition, Active ageing, Elderly-headed household, Social security, Pension

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THEMATIC AREA 3: GROWTH, EXPLORATION AND CONSERVATION
Attempts to develop the manufacturing sector in South Africa have had limited success over the past two decades. The opening of the local economy to global trade has placed substantial pressure on domestic manufacturers who have struggled to adapt to a markedly more competitive operating environment. One of the major frustrations expressed by South African industrialists who have attempted to advance their operating capabilities in the face of heightened competition is the lack (and associated high cost) of management skills to drive productivity improvements. This has been noted as a challenge within their own factories and the broader manufacturing ecosystem within which they operate (for example, logistics and transport service providers, and government services). In this paper I explore the urgency of senior management development within the South African manufacturing sector, and I emphasise the importance of Monozukuri to attracting skills into and developing competitive senior management capabilities in the manufacturing value chain. One of the ways in which Toyota South Africa has recognised and responded to this challenge is discussed. The recent establishment of the Toyota Wessels Institute for Manufacturing Studies, which the Toyota South Africa Education Trust has founded to support the development of the continent’s next generation of manufacturing leaders, is explained and its purpose and objectives explored.

**Keywords:** Manufacturing, Competitiveness, Skills, Management, Monozukuri

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Justin’s research interests relate to all things manufacturing. He has worked in over 30 countries and advised several governments on their industrial policies. All Justin’s qualifications are from the former University of Natal. Justin completed his BA (Hons) and MSocSci in 1994 and 1995 respectively, and his PhD in 2001.

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As "The History of Geophysics in Southern Africa" (2015; JH de Beer ed.) reviews, South African gold mines offer international researchers access to the world’s deepest natural scientific laboratories. SA-Japanese collaboration in seismology began in 1994. Major projects include “Observational studies to mitigate seismic risks in mines” (2010-2015), supported by JST-JICA, SATREPS, DST, NRF, CSIR and the South African Research Chairs Initiative (SARChI). This project aimed to understand earthquakes better to contribute to the United Nations’ SDGs (mitigation of seismic hazards both in South Africa and Japan and sustainable mining in South Africa). This success was followed by “Drilling into seismogenic zones in South African gold mines” (DSeis; 2016-present), supported by the International Continental Scientific Drilling Program (ICDP), JSPS core-to-core program; “Research cooperation between ICDP projects to drill into seismic zones in South Africa and India” (2017-2019); the JSPS-NRF bilateral joint research program “Stress states and seismic structures beneath gold mines in the source area of the 2014 M5.5 Orkney earthquake” (2018-2020); and SARChI. In the Japanese financial year 2017, Japanese researchers (excluding undergraduate students) spent 384 man-days in South Africa to work with not only South African but also US, German, Swiss and Indian researchers, fostering both SA and Japanese undergraduate students. The unprecedented drilling into seismogenic zones enabled us to recover material that will help us understand why and how the M5.5 Orkney earthquake occurred. Full-core-drilling let us probe a complete geological column (from the Roodepoort to Babrosco formations in the West Rand Group). Associated data (e.g. mine's legacy seismic reflection data; a package of SA geological history during 2.9 - 2.0 Ga) will enhance our multi-disciplinary interpretation, not only of the Orkney earthquake, but also of deep life and possibly the deep subsurface structure of the rim of the Vredefort impact crater.

**Keywords:** Deep natural laboratory for international collaboration

**Biography:**
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Ray leads a research group of about 40 persons. He is Co-Director of the AfricaArray program which maintains a Sub-Saharan network of geophysical observatories and conducts research and builds capacity to support the minerals, energy, geohazards and geodynamics sectors. His interests include the mitigation of the risks posed by mining-induced and natural earthquakes.

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Having gold, coal, platinum, and diamonds as part of its major mining sectors, South Africa is abundant in underground mineral resources. However, the growth in the global population leads to an increase in the demand for these resources, leading to the need for deeper mines which consequently increases the risks faced by the mining personnel. In recent years, it has become increasingly important to develop more efficient, advanced technology that can maximise production while reducing negative impacts on the environment.

Japan has shown remarkable improvements in Information Communication Technology (ICT), mainly in soft computing, artificial intelligence, big data and data mining. The versatility of ICT and its compatibility with other technologies enable its application in various fields, making it the interest of recent years of research. The utilisation of ICT in resource digital technologies such as DigiMine to achieve sustainable development, this research suggests the implementation of Smart Mining in South Africa. The aim of this research is to develop a robust monitoring system that can help in monitoring the safety of the mining personnel in the progressively complex underground mines. The proposed monitoring system enables the comprehension of the changing stress conditions underground. Thus, the development of a sensor unit to obtain the data and a conveying transmission system is necessary. This research suggests the continuous monitoring of bedrock stress using a sensor paired with the usage of Wi-Fi Direct to convey the obtained data above ground. This research also describes the experiments conducted to verify the ability of the proposed monitoring system.

**Keywords:** Smart mining, Monitoring system, In-situ stress, Wi-Fi Direct, Underground mining, ICT

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USING SATELLITE DATA TO ASSESS THE IMPACT OF AGRICULTURAL MINIMUM WAGES IN SOUTH AFRICA

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Before 2019 South Africa implemented sector-specific minimum wages in selected parts of the economy. Existing research has been limited to analysing the effects on workers, with the consensus that agricultural jobs were destroyed. Little is known about impacts on firms and production due to the lack of appropriate and reliable national data. We also identify this gap in the broader international literature and it forms an important part of the debate as it assists in understanding how minimum wages are absorbed. Employment could be protected at the expense of profits or consumer welfare if firms pass on the cost increase to consumers; alternatively, if employment losses do emerge, profitability may decline if firms are not resilient or large enough to change their production processes. Sections of South Africa’s agricultural sector fit the latter description and present a relevant case study to understand how wage shocks are accommodated in labour and product markets. We use satellite data to investigate how productivity changed due to agricultural minimum wages. We use gridded land cover data from 1994, 2000 and 2005 from the Food and Agricultural Organization to obtain a national perspective of land cover at fine spatial resolution. We then obtain Normalized Difference Vegetation Index (NDVI) values – a measure of vegetation health – for agricultural areas which is used as a proxy for productivity. To measure the causal impact of the policy shock on the vegetation index, we employ a difference-in-differences estimator based on the intended intensity to be treated, constructed as the (log) difference between legislated minimum wages and actual wages paid prior to the policy implementation. Results suggest that agricultural minimum wages decreased NDVI values up to 13% of its potential range in South Africa. With similar employment losses, we conclude that South African farmers were not able to accommodate the shock of minimum wages.

Keywords: Minimum wage, Satellite data, Productivity, Agriculture

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WHAT DETERMINES THE STRICTNESS OF DOCUMENTATION REGULATION IN TRANSFER PRICING?

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Researcher

As the influence of multinational enterprises (MNEs) grows in international trades, the number of intercorporate transactions between different tax jurisdictions increases as well. Driven by tax rates differential, MNEs shift income across countries using such transactions and minimize their tax payment. OECD publishes an annual guideline and has recommended that its member countries strengthen the transfer pricing documentation regulation. The documentation refers to the records to show that intercorporate transactions are conducted at arm’s length. Tax authorities inspect this document to enforce their tax rules. This study traces the changes in the documentation regulation of 44 countries during 2009-2017. With Lohse et al. (2012)’s evaluation scheme, each country’s documentation rule was classified based on a 0-5 point scale (5 is the most stringent). The result of the classification shows that the average scale increased from 3.38 to 3.98 during the study period. That means that a documentation requirement becomes more stringent. International harmonization of the rule has also improved. A change in document regulation does not seem to be related to tax environments like a tax rate or law’s origin. However, the correlation between the stringency of the regulation and the size of the economy or trade activities remains negative. This suggests that some major trading countries refuse to upgrade their regulation and continue to give MNEs opportunities to shift income across countries. On the other hands, countries with a small economy and minor trading activities seem less hesitant to upgrade their documentation regulation. This is an irony since they might need more international trades for growth but actually make them less attractive to MNEs. This situation might nudge tax authorities in those countries into a less strict implementation of the regulation.

Keywords: Transfer pricing, Documentation, Tax, International trades, OECD

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Hyunkoo has been involved with studies related to financial information disclosure. He teaches accounting and corporate governance subjects in the MBA program. Before joining the International University of Japan, he taught at Hong Kong University of Science and Technology. He received his PhD in Accounting at Carnegie Mellon University, USA.

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Synthetic gypsum is produced as a by-product from Flue Gas Desulfurization technology that aims at reducing the SO₂ emission from power generation industrial company in South Africa. FGD gypsum produced has less impurities as opposed to natural gypsum. More than 8 million tons are expected to be produced when this technology is implemented in other plants and may result in industries accumulating the costs of disposal/storage and contamination of the environment. South African gypsum imports equaled 1.9 kt in 2008. Increased use of synthetic gypsum conserves natural gypsum and reduces the need to mine resources. This study aims at developing an environmentally friendly and cost-effective technique for recycling and utilizing gypsum as construction material for civil works. Baseline studies were conducted to characterize gypsum through the evaluation of the morphology, mineralogy, chemical composition and geotechnical properties. Results showed that gypsum was found to be non-plastic with maximum dry density (MDD) of 1425 kg/m³ and optimum moisture content (OMC) of 18.5%. The XRF results show that the material has SiO₂ and Al₂O₃, constituents applicable for building and construction materials as a minimal percentage while the concentration of S and Ca is more than 90% of the total weight, with relative proportion of 43.54 wt% and 51.35 wt% respectively. With respect to unconfined compressive strengths, on day 3 and 7, the material had strength of 4.87MPA which is more than the minimum permissible burnt masonry clay and can also be used as a mortar or for dry walling. However, a decrease in strength was observed on day 14 to 3.75MPA but still the strength obtained met the minimum requirements for the material to be used in bulk as building construction elements.

**Keywords:** Flue Gas Desulfurization (FGD) Gypsum, Fly Ash, Basic Oxygen Furnace (BOF) Slag, Unconfined Compressive Strength (UCS), Stabilization, Beneficiation

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Dumisane is a UJ Masters student working on characterization of Wet Flue Gas Desulfurization (WFGD) gypsum as a by-product and its compatible additives for building and construction. Dumisane has been with General Electric at Kusile Power Station for three years now, completing his training as an Engineering Council of South Africa (ECSA) Professional Technologist.

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The Pacific and Southern Oceans are crucial marine ecosystems globally. For instance, the Southern Ocean is responsible for the uptake of substantial amounts of anthropogenic carbon, while the Pacific provides crucial marine services. There is now some understanding of phytoplankton biology and the influence of oceanographic variables which is leading to improved models incorporating the biological carbon pump. The degree of uncertainty in these models remains high and there is increasing recognition that other biological components (e.g. chemoautotrophic microorganisms) may be the source of these discrepancies. However, very little is known regarding the functional status of microbial guilds, which may be crucial in consolidating the carbon deficit. Here, we propose a series of subprojects, using state-of-the-art technologies, aimed at elucidating the role of chemoautotrophic in the Pacific and Southern Oceans. Taken together, these projects directly address a fundamental biodiversity topic as identified through the South African Marine and Antarctic Strategy Plan and Scientific Committee for Antarctic Research framework documents. I will detail our advances, including key aspects of South Africa’s cooperation with Japan.

**Keywords:** Bacteria, Archaea, Fungi, Southern Ocean, Marine, Metagenomics

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Plastics and foundry sand are essential materials in our daily lives. As there is a continuous increase in production of these waste materials, the management of solid waste might be an environmental issue. This occurs due to the shortage of space which causes landfilling and increasing cost of waste disposal to the environment. Plastics are normally used in packaging, building, automotive and other industries. Their accumulation causes environmental issues since they cannot be changed into their natural state by bacterial action. Spent foundry sand (SFS) is a by-product generated from a ferrous and non-ferrous metal moulding production which is high in silica content. In the process of casting, moulding sands are recycled and re-used until they cannot be utilized anymore. They are then disposed of in the environment. This paper aims to investigate the possibility of using waste plastic (High Density Polyethylene) as a binding material and SFS (chemically bonded) from aluminium foundry to produce building material(s). The plastic waste material was cut, weighed (with plastic proportions: 10, 20, 25, 30, 35 and 40%) and then placed together with SFS in a crucible whereby it was heated (using a muffle furnace) for the plastic to melt, then mixed to produce a paste (moulded to produce specimens). Specimens were tested for heat resistance, water absorption, Unconfined Compressive Strength (UCS) and Thermogravimetric analysis (TGA). The results showed that the specimen with 10% plastic had low UCS (0.8MPa), as it did not have enough plastic to bind. However, the UCS from 20-40% HDPE:SFS showed better results. The UCS obtained from the produced specimen is from 12-31MPa. The specimen can be used as concrete building blocks (7MPa), paving blocks and tiles (25MPa). In order to conclude that the specimen can be used as paving/building blocks and tiles, further tests such as water absorption, heat resistance and TGA should be done.

Keywords: Waste plastic, Spent foundry sand, Tiles

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INDIGENOUS KNOWLEDGE INHERENT IN TRADITIONAL BEEKEEPING AS MINOR SUBSISTENCE IN TSUSHIMA ISLAND, JAPAN

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The concept of minor subsistence is attracting interest as a framework for understanding the relationship between humans and nature. Although the direct translation of minor subsistence into Japanese is “fukuji-teki seigyo” (auxiliary livelihood), recently it is often translated as “asobi shigoto” (playful work) since activities such as collecting edible wild plants, mushrooms and insects in the hills and fields, or fish and shellfish at the water edge, comprise a considerable element of fun. In this study, attention was directed to the traditional beekeeping of the Japanese endemic honey bee, *Apis cerana japonica*, which has been successively passed down in Tsushima Island, Nagasaki prefecture, Japan. A field survey focused on the way in which humans and nature relate to each other was conducted. Furthermore, indigenous knowledge accumulated in space and time was surveyed to understand the role played by traditional beekeeping in the conservation/regeneration of the local eco-system. The present study is an attempt to visualize the relationship between humans and nature, which has become difficult to perceive in modern society. Our results suggest that clues for building a truly bountiful and sustainable society may be hidden in traditional lifestyles in Japanese modern society. Comparing the traditional Japanese beekeeping culture to that of other countries (such as South Africa) where indigenous beekeeping traditions are very much alive, could help us develop a more holistic approach to environmental education in the presence of the challenges brought about by modernization and globalization.

**Keywords:** Indigenous knowledge, Traditional beekeeping, Minor subsistence, Tsushima Island

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Graduated from the School of Agricultural Science of Hokkaido University, Mr Mizota has worked as an entomologist in topics ranging from taxonomy, ethno-entomology and conservation biology. Since joining Miyagi University of Education, he has also been involved with studies related to environmental education and ESD (Education for Sustainable Development).

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STABILIZATION OF BARBERTON GOLD MINE TAILINGS USING HIGH PERCENTAGE OF LIME (CAO): IMPROVE GEOTECHNICAL PROPERTIES OF GOLD TAILINGS FOR BUILDING AND CONSTRUCTION

Mkhonto, NE
Mashifana, TP, Sithole, T
(University of Johannesburg, South Africa)

Student

Gold mine tailings are hazardous in nature because of the toxic chemicals that are added during the extraction process and this causes an environmental hazard. In this present research cyanide treated gold mine tailings were stabilized with high percentage of CaO to minimize the hazardous effect of tailings on the environment and to evaluate its application in building and construction. Specimens were cast at their optimum moisture content and maximum dry density and cured for 4 and 7 days at room temperature. The gold tailings were then stabilized with lime and cured for 3; 3 (oven); 7; 14 and 28 days at room. The unconfined compressive strength reached a maximum strength of 4.68MPa after 7 days of curing and strength loss was observed on days 14 and 28. The strength loss was influenced by the retardation of the hydration process due to the high concentration of SO3 present in the lime. The results showed that lime stabilized gold tailings can be used in building and construction as it exceeded the minimum recommended unconfined compressive strength for reusability of treated waste material of 345 kPa (US EPA, 1986) but the strength loss during the curing process indicates that low/normal CaO should be used to stabilize for continued strength gain.

Keywords: Stabilization, Gold tailings, Lime (CaO), Beneficiation, Unconfined compressive strength

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Ntsako from Mkhuhlu holds a National Diploma and BTech in Chemical Engineering. She is currently pursuing her Master’s Degree in Chemical Engineering on a project based on waste beneficiation and nanotechnology. She worked at Mintek as an in-service trainee. She is a tutor, lab assistant and Residence Academic Advisor (2015). Besides research she loves traveling.

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RETHINKING THE GLOBAL ROLE AND SIGNIFICANCE OF ‘OTAKU’ IN INNOVATION AND DIFFUSION OF POP CULTURE

Morio, T
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Researcher

In the Japanese pop culture such as mangas, animation films and video games and the contents business, OTAKUs (in Japanese, similar to ‘geek’) play a unique and crucial role. They have contributed to the contents business as an early adaptor for diffusion of products and contents as well as high fidelity consumers. At the same time, they have contributed to producing and leading new trends as creators and innovators. However, as the history of the development of OTAKUs in Japan is highly dependent on the Japanese social and cultural context, it is not clear whether their role can be applied globally or is limited to unique Japanese circumstances. To address the issue, I propose a comparative study of those corresponding to the OTAKUs (African OTAKUs) in South Africa and Algeria, where a volume of original manga creators and opportunities to publish a wide variety of fan events such as cosplay and fanzine are emerging and expanding. In the study, I survey the behavior of African OTAKUs as consumers, diffusers, creators and innovators through a literature search, interviews with the creators, publishers, fans and business persons involved and attending events. In my presentation, I will show details of the research proposal and seek possible collaborators in South Africa.

Keywords: Contents business, Pop culture, OTAKU, Diffuser, Innovator, Creator

Biography:
Dr Takahiro Morio
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As Professor in the Office of Global Initiatives, Dr Takahiro Morio is involved in planning the international academic cooperation strategy of the University of Tsukuba and coordinating an academic exchange with universities in African countries. His current research topics are innovation, higher education and contents business in Africa.

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SOUTH AFRICAN INVESTMENT AND CONTRACT FARMING: THE CASE OF BEER INDUSTRY IN UGANDA

Nishiura, A  
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Researcher

Although contract farming is a growing phenomenon in Africa, research on contract farming for locally consumed food production has not been sufficiently done. Will contract farming contribute to “Zero Hunger” on SDGs? The case of the beer industry in Uganda is a unique example and provides several implications for agricultural development. The recent promotion of contract barley farming among smallholder farmers led by Nile Breweries, subsidiary of SABMiller appears to overcome the limitations of contract farming through the formation of farmers’ groups and the provision of extension services. The purpose of this presentation is to examine the changes in farmers’ production activity in the context of local procurement by foreign-affiliated beer companies based on the research in Kapchorwa area, 2010. There are three research questions: (1) Is barley production becoming popular among farmers in the area where beer companies introduced local procurement? (2) What types of farmers have entered into barley production? (3) Has barley production benefited farmers? According to a field survey, more than half of barley farmers started barley production in the past two years. This suggests that the number of barley farmers as well as the total cultivation area is increasing. Moreover, recent entrants include more female, young and tenant farmers compared to the farmers who started earlier, and the share of young and female farmers is particularly high among those supplying Nile Breweries. This evidence shows that the encouragement of local procurement by Nile Breweries, a latecomer, encouraged the participation of farmers who were not motivated earlier. The farmers were motivated by aspects such as the stability of revenue backed by the availability of seeds at a low price. Furthermore, favourable contract conditions offered by beer companies have lowered the entry barrier to cash crop production.

Keywords: FDI, South Africa, Uganda, Beer industry, Contract farming, Zero Hunger

Biography:  
Prof. Akio Nishiura  
Dean of Academic Affairs  
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Soka University  
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Since joining the Soka University, Prof. Nishiura has been involved with studies related to FDI, B-BBEE and agro-industry in South Africa and Eastern Africa. Before joining the university, Nishiura studied at the University of the Witwatersrand for two years as a visiting researcher. Since 2016 Nishiura has worked as Dean of Academic Affairs.

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Elders in a community often have experiential learning regarding the utilization of wild sourced food that may be lost if opportunities to share knowledge with younger generations are not created. Vespula spp. is a type of colony forming wasp, known in the vernacular as Hebo. The adults and brood of Hebo are a cultural food sourced from the forested, mountainous region of Central Japan. This study investigated the response of high school students to the use of Hebo. Local experts in the age category of 65 and upwards demonstrated how to attract and follow wasp foragers to the underground nest. The nest was removed and maintained for many months to increase the food value of the brood. Such sharing of information is important as Hebo harvesters are ageing and the activity requires physical strength as well as knowledge. In 2016, a high school student club called the Hebo Club was established to promote Hebo. The elders’ insatiable inquisitiveness and resourcefulness with Hebo harvesting and rearing infected the youth. They raised funds to build a museum where the knowledge they had gained could be exhibited. They also undertook surveys with their peers regarding the acceptability of Hebo as a food. The Hebo Club developed an ecotourism plan for the area to assist the local economy. Their enthusiasm motivated the elders to expand their efforts to other areas of Japan that were unfamiliar with using Hebo. The positive impacts in natural science education and the value of people coming to a rural area to enjoy Hebo offer a case study which could be replicated in South Africa. Bee keeping as well as the use of insects as food are activities that are becoming increasingly popular in South African schools.

Keywords: Wasp, Habit, High school student, Indigenous knowledge systems

Biography:
Dr Kenichi Nonaka
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Dr Nonaka has been involved with studies related to cultural ecology as well as geography and ecological anthropology in interdisciplinary cultural studies since 2007. He has studied subsistence activity, regional resource use and environmental cognition, conducting fieldwork in Japan, Southern Africa, South-east Asia and Oceania.

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The South African economy is currently facing the triple developmental challenge of unemployment, poverty and inequality. Since the dawn of its democracy South Africa has adopted an economic program and policies aimed at the stimulation of growth its ailing economy. It has also been the focus of the current administration to increase the inflow of investment to the various sectors of the economy to stimulate growth and ultimately contribute to addressing the developmental challenges of the nation. This paper explores the various ways in which Japanese direct investment can contribute to this process. It acknowledges the improved relationship between Japan and South Africa through frameworks like the TICAD but acknowledges the fact that South Africa is still not a prime destination for Japanese investment. This is despite the presence of companies such as Toyota, Nissan and Mitsubishi in South Africa. By looking at Japanese investment on a comparative basis, side by side with other top investment originators (EU member states and the USA), the paper makes recommendations on how Japanese direct investment in South Africa could be tailored to have a greater growth and developmental impact upon the South African economy. Part of improving the growth and developmental impact of Japanese investment in South Africa should entail helping the South African economy leapfrog into the race of the 4th Industrial Revolution and this should also lay the groundwork for trilateral cooperation that sees both Japan and South Africa conducting joint businesses on the African continent.

**Keywords:** Direct investment, Economic growth, Economic development, Trilateral cooperation.

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**Biography:**

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Dr Nubong is a political economist with a Master’s Degree in Economics and and a PhD in International Relations. He previously worked as a postdoctoral fellow at the Institute for Strategic and Political Affairs (ISPA) at the University of Pretoria, South Africa. He has also worked as a researcher at the Center for Governance Innovation at the University of Pretoria, as a project officer at the European Center for Development Policy Management (ECDPM) based in Maastricht in the Netherlands and as a socio-economist with the European Union Delegation to South Africa. His primary research interests are regional integration with a focus on trade integration and foreign direct investments, with a regional focus on the European Union and the African Union. His other research interests include transformative leadership and the capacity imperatives for the implementation of the Sustainable Development Goals (SDGs) in Africa.

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The Southern Ocean off shore of South Africa is the biogeographical hot spot in environmental microbiology. In the global ocean circulation, the Southern Ocean is the place of the formation of Antarctic deep water that transfers atmospheric gas including \( \text{O}_2 \) and \( \text{CO}_2 \) into the deep ocean. Therefore, to know and estimate the impacts on the marine ecosystem, understanding the microbial ecosystems that fix inorganic carbon and consume \( \text{O}_2 \) associated with the Southern Ocean is essential. The JAMSTEC microbial oceanography team has a project including global microbial geography and global geochemical circulation. We have started a collaboration with a team from the University of Pretoria led by Thulani Makhalanyane to understand the Southern Ocean microbial ecosystem from sea surface to the bottom water and observe the impacts of the changing ocean on the marine microbial ecosystem. On the other hand, Southern Ocean harbors may harbor a unique chemosynthetic (microbial) ecosystem associated with hydrothermal vents along with the mid-ocean ridge system (Southwest Indian Ridge) located between the Indian Ocean and Atlantic Ocean. To date, signatures of hydrothermal vent fluids along with the ridge system have been observed, but the Southwest Indian Ridge is the least explored mid-ocean ridge system on earth. The Southern Ocean hydrothermal ecosystem is expected to harbor previously unseen chemosynthetic ecosystems and is essential to understanding the global geography of chemosynthetic animals. To understand the hydrothermal vent ecology of the Southern Ocean, future international explorations are necessary.

**Keywords:** Southern Ocean, microbiology, ocean circulation, ocean acidification, hydrothermal vent, chemosynthetic

**Biography:**
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Since joining JAMSTEC, Dr Takuro has been involved with projects related to environmental microbiology for marine and subsurface microbial ecosystems. Before joining JAMSTEC, he obtained a PhD from the Graduate School of Agriculture, Kyoto University. Since 2016 he has worked as Deputy Director of the Research and Development Center for Marine Biosciences.

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MULTIPLE USES OF TERMITES AND TERMITE MOUNDS IN SOUTHERN AFRICA AND SOUTHEAST ASIA

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Nonaka, K (Rikkyo University, Japan)
Miyagawa, S (Gifu University)
Takenaka, T (Nagoya University)
Nzira, JJ (Ukuvuna Urban Farming Projects, South Africa)

Researcher

The relationship between human and termite is found in many parts of Southern Africa and Southeast Asia. This study clarified the use of termites as food but also multiple uses as well as the use of termite mounds as land according to the similarity and differentiation of usage. The data was collected by the authors’ fieldwork and surveys conducted in Southern Africa and Southeast Asia such as Botswana, South Africa, Zimbabwe, Cambodia, Lao PDR and Thailand. Collecting techniques and cooking methods are varied, and the soil of termite mounds is also used in various ways. The methods of collecting and cooking used according to the life stages of termites, the use of termite mounds, including soil and places, and the products from the specific plants on the termite mounds were investigated. In Southern Africa, workers, soldiers and reproductive are harvested as food for both self-consumption and commercial food. The termite mound soil is used as the material of bricks for building houses and flooring and fertilizers for maize. Termite mounds are also used as crop fields. Pregnant women eat it in particular as micro nutrition intake. Termite mounds are considered sacred places, especially to ancestors’ memory in Southern Africa. In Southeast Asia, only reproductive is used as food. Termite mounds are found in the paddy fields. Smaller mounds are sometimes used for planting vegetables. Larger mounds with specific vegetation remain in the paddy fields, which composes special landscapes with a mosaic of paddy fields and woodland. The mounds in the paddy field have an effect on rice production. In Laos and Thailand, some mounds are regarded as sacred places. Thus it may demonstrate humans’ sustainable living with termites, which integrates food supply, farming, and housing.

Keywords: Termite, Soil, Food, Fertilizer, Sustainable living

Biography:
Dr Eisuke Ono
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Dr Ono has been involved with studies related to physical geography and geoarchaeology. He has studied the history of the relationship between human activity and natural environment, conducting fieldwork in Japan, Southern Africa, South-east Asia and Oceania.

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Lemon fruits are often grown or purchased for the juice content which is regarded as a good source of vitamin C, while the peel and leaf are regarded as waste. This study investigated the phytochemical profile of the crude solvent extracts and essential oils of *Citrus limon* waste and some bioassay to unveil the hidden biological potential of this waste for the management of some illnesses and agricultural benefits. Phytochemical screening of the aqueous leaf and peel extracts was done using known methods while the essential oil was isolated using hydrodistillation method. Antioxidant assay was done using DPPH and Ferric reducing power methods. Inflammatory, analgesic and toxicity potentials of the extracts were assessed using known method. Insecticidal activity of the oil on maize weevils was also evaluated. The chemical composition and antioxidant activity divulges that *C. limon* leaf and peel oils are of medicinal value and should not be treated as waste. Agricultural and socio-economic benefits of lemon peel waste reveal it as an alternative ingredient to maize in livestock feed production.

**Keywords:** *Citrus limon*, Essential oil, Crude extract, Phytochemical screening, Antioxidant, Post-harvest preservation

**Biography:**
Prof. Adebola Oyedeji  
Head, Natural Product Research Group  
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My research focus since I joined the tertiary education system in 1992 has been bioprospecting medicinal plant residues for the management of some human illness and insecticides for farm produce (anti-ticks and grain weevils).

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Improving economics and scaling up are major challenges for commercial scale production of energy, feed and other commodities from microalgae biomass. The use of wastewater as growth medium for microalgal cultivation and production of multiple products could improve the economic viability and sustainability of the process. Coupling the tertiary treatment of wastewater with microalgal cultivation is a strategy for both pollution control and biomass production. In the present study, microalgae were cultivated in a raceway pond (300,000 L) using optimized concentration of NaNO₃ (250 mg L⁻¹) as nitrogen source in synthetic medium and final effluent from wastewater treatment plant. Strategy development included investigations on growth physiology, biomass production, population shift, potential reasons for pond crash and indicators, effect of drying technique on lipid recovery, biochemical composition in whole and lipid extracted algae (LEA). Results showed that microalgal biomass production in wastewater was comparable to synthetic medium, and developed strategy reduced the use of nitrogen source in synthetic medium and wastewater. Sun and oven drying techniques did not affect lipid recovery and, showed 23.73% and 22.56% of lipid recovery on dry cell weight (DCW) basis respectively. After lipid extraction, LEA contained 30.44% of proteins and 19.04% of carbohydrates, which was comparable to whole algae biomass (31.13% proteins; 21.21% carbohydrates); and therefore can be further utilized for various applications. Investigations on microalgae population showed that during the winter season, Scenedesmus sp. was the dominant microalga, while Chlorella sp. was dominant during the summer season. Main indicators for pond crash were change in culture colour, reduction in various parameters such as dissolve oxygen, pH, total cell count, photosynthesis performance. Therefore, the routine analyses of all these parameters is crucial to avoid abrupt pond crashes. The results highlighted microalgal cultivation in wastewater as a low cost strategy for biomass production and potential applications of whole and LEA in energy and feed production.

**Keywords:** Microalgae, Wastewater, Lipid extracted algae, Protein, Lipid, Carbohydrate

**Biography:**
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Dr Renuka is a postdoctoral researcher at the Institute for Water and Wastewater Technology. Her areas of specialisation include algal biotechnology and environmental microbiology. She has eight years of research experience in the field of algal biotechnology and has published in highly reputed and leading international peer reviewed journals.

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SHOWCASING THE USE OF EDIBLE INSECTS FROM AFRICA AND JAPAN

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(Itami City Museum of Insects, Japan)

Dzerefos, C (North-West University)
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Researcher

Special exhibitions of entomophagy were held in Itami City Museum of Insects, Japan, in 2007 and 2015. Edible insects could also be purchased by the public at the events. The organizers aimed to familiarize the public with edible insects and their traditional and future use as food. Although Japan has a history of entomophagy it is now restricted to certain rural areas and is unknown to many city dwellers. The insect exhibitions were an important effort to counterbalance the negative image of disgust and repulsion that many people have been taught in the modern era. A variety of cooked insect dishes from all over the globe were displayed on tables as they would be served in the country of origin. This included the well-known mopane worms and other lesser known edible insects such as termites and the inflated stinkbugs from Southern Africa. Insect harvesting tools and apparatus that could be used in mini-livestock production were displayed. Photos and films of harvesters practicing their traditional craft of harvesting and sourcing insects from the wild were shown. There was also footage on processing the insects for human consumption which requires learning from indigenous knowledge keepers which have a close association with and understanding of nature. The exhibition was seen by 27,995 people in 2007 and 26,860 people in 2015. The journey of insects from their natural habitat to the plate, which was termed “nature to mouth”, caught the attention of many Japanese who were previously repelled or not informed of entomophagy. The exhibitions encouraged many first-time tasters of insects who are now interested in finding out more about insects.

Keywords: Insects, Entomophagy, Exhibition, Museum, Public education

Biography:
Mr Noboru Sakamoto
Vise director
Itami City Museum of Insects
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For the last 20 years, Noboru Sakamoto has been an educator and curator at the Itami City Museum of Insects in Japan. He has specialized in creating exhibits to familiarize the public with ethnographic entomology. This has involved experiential exhibits with edible insects.

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Environmental chemistry could lead to a comfortable life for people by addressing various environmental issues, e.g. air pollution, soil contamination and water purification. In this presentation, the activity and research topics of our Faculty of Environmental Chemistry and Chemical Engineering at Kogakuin University will be introduced. Our mission is to study and develop advanced engineering methodology or a better understanding of the fundamentals of environmental issues on the basis of the knowledge of chemical engineering. We aim to cultivate our graduates to become successful chemical professionals and researchers who can contribute to improving and solving the environmental problems of society and industries. Among the issues, water treatment for making potable water has been paid much attention. Water is a critical resource for human life and securing safe potable water is important for human health, and a stable supply of agricultural water is necessary for food production. Membrane technology is utilized widely in the world for water treatment. Reverse osmosis (RO) membrane consists of a dense polymer film that can permeate only pure water from mixed solutions driven by the pressure difference across the membrane. The efficiency of water purification is a function of the flux of water that usually declines as time increases because the membrane surface is covered with contamination solved or unsolved in water. This phenomenon is called “membrane fouling” that fundamentals can be described by the chemical interaction of fouling molecules and surface of polymers. The research on better understanding fouling from microscopic level and developing novel polymer materials that could control the chemical interaction increases the efficiency of membrane technology for water purification. The other important mission of environmental chemistry is the management of emission of carbon dioxide. Research of secondary battery also contributes the issues related to air pollution and energy supply because of low carbon dioxide emission. Advanced technology for CO₂ management, as well as materials with low CO₂ emission, are investigated. In the presentation, the advanced system and materials that contributed to improving environmental issues will be discussed.

Keywords: Environment, Water, Secondary battery, CO₂ emission, Soil contamination, Air pollution

Biography:
Dr Hiromitsu Takaba
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Dr Takaba obtained his PhD from Tohoku University in Japan in 1998. After working in the University of Tokyo as a Research Associate and Tohoku University as an Associate Professor, he became Professor at Kogakuin University in 2014. He has published more than 170 papers and received an awarded from the Japanese Membrane Society in 2006.

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This paper describes the challenges of meeting the demands of transformation at a music archive with a colonial past and one based in a socio-economic context with very limited resources. In the past few years, the founder of ILAM in 1954, Hugh Tracey, has been accused of exploiting indigenous performers and of being an agent of colonialism and apartheid, in as far as his stereotyping and essentialising of African music are concerned. The weight of this criticism has been severely felt inside ILAM and in the perception held by many others on and off campus (Coetzee 2015, Edwards 2016). ILAM’s role as a custodian of the music heritage of the continent has been cause for much interrogation as to how it should manage itself in the contemporary milieu where the demands for its continued existence hold sway. As with other archives in much of the world, ILAM is currently exploring the means by which it can redeem itself from a negative association while also exploring ways of transforming in a manner by which it could set forth into a globally connected twenty-first century. Drawing on several examples of our new emphases this paper describes how ILAM is currently situating itself in partnerships with institutions and community organisations to help remove its tarnished past.

**Keywords:** Archive, Colonialism, Apartheid, Transformation, Partnerships, Collaboration

**Biography:**
Dr Lee Watkins  
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Lee Watkins is mostly interested in the applied study of music, that is, how the study of music could lead to social and economic development particularly in rural South Africa. Other interests are music in relation to hip hop studies, migration and refugees and the archive for the twenty-first century. Previously he was Lecturer for Ethnomusicology at Rhodes University and the University of Hong Kong, and is currently serving as Director of ILAM.

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Lee Watkins is mostly interested in the applied study of music, that is, how the study of music could lead to partnerships with institutions and community organisations to help remove its tarnished past. Several examples of our new emphases this paper describes how ILAM is currently situating itself in transforming in a manner by which it could set forth into a globally connected twenty-first century. Drawing on exploring the means by which it can redeem itself from a negative association while also exploring ways of demands for its continued existence hold sway. As with other archives in much of the world, ILAM is currently past and one based in a socio-economic context with very limited resources. In the past few years, the founder This paper describes the challenges of meeting the demands of transformation at a music archive with a colonial social and economic development particularly in rural South Africa. Other interests are music in relation to hip hop studies, migration and refugees and the archive for the twenty-first century. Previously he was Lecturer for Ethnomusicology at Rhodes University and the University of Hong Kong, and is currently serving as Director of ILAM.

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PARTNERSHIPS AS A WAY INTO THE FUTURE AT THE INTERNATIONAL LIBRARY COMBINING THE CONSERVATION OF INTANGIBLE CULTURAL HERITAGE WITH ARCHIVE, COLONIALISM, APARTHEID, TRANSFORMATION, PARTNERSHIPS, COLLABORATION

Due to their persistence and global distribution the use of organochlorine pesticides (OCPs) has been banned in most countries around the world. The Phongolo River floodplain and Kruger National Park in north-eastern South Africa are high risk malaria areas where DDT is used as vector control agent through indoor residual spraying (IRS). Over the past seven year’s studies have been undertaken to determine the degree of DDT exposure in the aquatic ecosystem through analyzing DDT bioaccumulation in a number of different aquatic species. Concomitant biomarker analyses were undertaken to determine the biological effect of the DDT exposure. We tested the hypothesis that increased DDT exposure will elicit similar biological responses across species. Bioaccumulation of DDT (and its metabolites) were measured in two decapoda, six fish and two amphibian species. Biomarkers of exposure (CYP450 and AChE) and effect (catalase, SOD, malondialdehyde, protein carbonyl, and CEA) were analysed in the same organisms. Using principal component analysis and discriminant functional analysis the exposure and effect data were integrated to elucidate the responses of aquatic biota to DDT exposure. Although higher trophic level organisms (i.e. tigerfish - Hydrocynus vittatus and Müller’s clawed frog - Xenopus muelleri) displayed the highest DDT bioaccumulation there were no distinct biomarker responses evident. When exposure data of another banned OCP, hexachlorocyclohexane, were included in the analysis, significant relationships with cytochrome P450 and lipid energy reserves were obtained. The results therefore indicated that biological responses were not related to DDT but rather to HCH exposure. These data clearly indicate that legacy organic pollutants are still present at high levels in the environment and if not monitored could have adverse ecological and human health risks.

Keywords: Fish, Amphibians, Pesticides, DDT, Oxidative stress, Species differences

Biography:
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Victor is responsible for the environmental component of the DST Research Platform on safety, health and environmental risk of nanotechnology. He has extensive international collaboration, including with Hokkaido University. He has authored 120 peer reviewed papers and trained 64 MSc and 25 PhD students in the field of ecotoxicology.

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ASSESSMENT OF IMPACT OF CLIMATE CHANGE ON WATER SECURITY IN SOUTH AFRICA: A CASE STUDY IN A SEMI-ARID RIVER BASIN

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Researcher

Recent climate projections suggest a drop of up to 10% in precipitation in most of Southern Africa by 2050. It is estimated that by the year 2025 almost one-half of the world population will be living in water stressed regions. Furthermore, rapid population increase, industrialization and pollution are putting a strain on the available and diminishing fresh water resources. The main aim of this paper is to assess the impact of regional climate change scenarios on the availability of water resources in a semi-arid river basin in South Africa. In this paper, statistically downscaled data were derived from the GCM simulations of the Coupled Model Intercomparison Project Phase-5 (CMIP5) and across two greenhouse gas emission scenarios known as Representative Concentration Pathways (RCP) 4.5 and 8.5. The spatial resolution of the dataset is 0.25 degree x 0.25 degree (~25 km × 25 km). Six GCM (climate models) were used for this set of data. SWAT model was run using these data for a period of up to mid-century (2020 – 2050) and the results were then compared with long-term historical data. Comparison of measured data with simulated historical data showed a strong correlation ($R^2 \geq 0.9$), which is indicative of the reliability of projected future climate. Varied results were obtained depending on the type of climate model used, but generally the trends were similar in most cases. However, the multimodel average showed a possible decrease in precipitation (up to -14%), a decrease in water yield (up to -15%) and an increase in potential evapotranspiration (up to +10%). The latter is indicative of possible drought spells between rainy events. It is expected that the results of this research will assist in the formulation of adaptation strategies that will minimize the negative impact of climate change in the region.

Keywords: Climate change, Impact, Modeling, Water resources

Biography:
Prof. Yali Woyessa
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Since joining CUT, Yali has been involved with studies related to water resources management and published several papers in national and international peer viewed journals. He has also co-authored a book entitled “Regional Innovation: Government Policies and the Role of Higher Education Institutions”. Since 2013 Yali has been Head of the Department of Civil Engineering.

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THEMATIC AREA 4: TECHNICAL SESSION ON MODALITIES OF RESEARCH SUPPORT AND STAFF AND STUDENT MOBILITY
One of the contributions of the SDGs, widely spread over Japanese society, is that the SDGs push Japanese corporations to be more socially and globally oriented. This is a wonderful development. However, there are two challenges that Japanese corporations have yet to face. The first challenge is how to sense social issues happening elsewhere outside of Japan. Unfortunately, in Japan, the information people get about abroad, especially social issues, is limited and to a certain extent, skewed. The media tend to broadcast stereotyped images of a foreign country, which the audience is expected to see. Therefore, the fresh and real voices of the world are hard to hear. The second challenge is innovation. Without innovation, it is hard to achieve the SDGs. In order to innovate, diversity plays a major role. Yet that is not what Japanese corporations, nor society, are good at. I will address the Y4SDGs site, which is the collections of short videos concerning SDGs made by international MBA students. The website seeks to invite non-Japanese students in Japan to participate. By doing so, the website tries to create a platform for the voices of international students, familiar to Japan, to be heard. The platform will be helpful to connect voices of international students to Japanese corporations. Ultimately, the platform helps to make Japanese corporations aware of what happening. Also, it can be the base for open innovation attempts by international students and Japanese corporations, through various events of idea generation and business creation.

Biography:
Dr Mari Iizuka
Professor, Doshisha University Graduate School of Business
Director, Doshisha University Well-being Research Center
Representative, Japan Global Compact Academic Network, Japan

Dr Iizuka obtained her MBA and MA (in Development Economics) from Stanford University and her PhD from Kyoto University. After a stint at the World Bank in Washington DC working on projects for Africa, she founded Global MBA program in Kyoto, Japan, where students from all over the world study. She researches Mindfulness and SDGs, and heads the Japan Global Compact Academic Network as well as the Well-being Research Center.

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This MEXT scholarship is offered for the special Educational Program for Qualified Experts in Blue Economy, which has been granted to Tokyo University of Marine Science and Technology (TUMSAT) by MEXT. TUMSAT International Priority Graduate Program (TUMSAT-PGP) is inviting applications for Japanese Government Scholarships (MEXT Scholarships) to provide outstanding international students with an opportunity to pursue doctoral degrees through our academic program. Thanks to collaboration with the Southern Africa Development Community (SADC) countries, we work together to bring up talented persons who wish to grow together as experts of the ocean, water and energy to incarnate blue economy required in sustainable development with marine resources and marine industries with underwater mining; renewable energy; coastal, harbour and off-shore engineering; maritime logistics as well as fishery and aquaculture under social equity and ecology. Oceanography would be accompanied by those studies. The course of Applied Marine Environmental Studies, Graduate school of TUMSAT provides a 3-year PhD program with advanced environment frontier study and sustainability for 12 students per year - Japanese Government scholarship international students: 4, - Privately financed international students: 4, - Japanese students: 4. The program aims at developing global and highly skilled professionals leading research for the 3-year PhD program. The scholarship application is open to anybody who has any nationality of a country that has diplomatic relations with Japanese government. Following the strategy of this program, the positions are to be reserved for applicants from SADC and the countries concerned.

Biography:
Prof. Mitsuru Izumi
Department of Marine Resources and Energy
Tokyo University of Marine Science and Technology (TUMSAT)
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Since joining TUMSAT, Prof. Mitsuru has been involved with studies related to advanced materials and applied superconductivity to electric ship propulsion motors and tidal marine generators. Since 2008 Mitsuru has worked as a Director of the Office of Liaison and Cooperative Research (OLCR).

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J. F. Oberlin University has nearly 9,500 students, including graduate students and students from overseas. Every year we have about 750 foreign students enrolled at the university. We have over 170 partner schools in more than twenty countries and regions around the world. Our Japanese students acquire practical experience through a variety of programs, including not only language study and academic exchange programs but also volunteer programs and internship opportunities. The university has established five overseas offices to carry out various activities in international exchange and to support students studying abroad. The university’s main campus is in Machida, a suburb of Tokyo, and we have two branch campuses, one near Fuchinobe Station in the city of Sagamihara, Kanagawa Prefecture, and the other in Sendagaya, in the center of Tokyo. In addition we have research facilities off campus with lodging accommodation at Tama Academy Hills and Izu Kogen Club. For the purpose of participating in the South Africa-Japan University Forum (SAJU), we would like to expand the number of new partner schools. As a mission of our university, we plan to dispatch 25% of the number of undergraduate students by 2023 and plan to accept the same number of students from overseas by 2023. We would like to build a new network through this forum and create new study abroad programs. As mentioned above, our university accepts about 750 overseas students. There are many foreign students on our campus, not only Japanese but also multilinguals are increasing and cross-cultural exchanges are active on the campus. We would like to be a “globalized university” by dispatching and accepting students to our campus.

Biography:

Mr. Nobuo Kanda
Pre-opening Project Office for JFOU New (Shinjuku) Campus
J.F. Oberlin University and Affiliated Schools
Japan

Since joining the JF Oberlin University, Mr. Kanda has been involved with internationalization of not only the new campus in Shinjuku but also the whole university. Before joining Oberlin University, Kanda worked at Toyo University and was in charge of international partnership and inbound programs for three and a half years.

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RESEARCH AND EDUCATION OF UNIVERSITY OF TSUKUBA ON AFRICA

Morio, T
(University of Tsukuba, Japan)
Researcher

The University of Tsukuba is a relatively young national university with 45 years’ history, but it was originally founded as a Higher Normal School in 1872, the oldest teachers’ training college in Japan. In the founding philosophy, it identifies itself as a university open internationally and trans-disciplinarily (trans-border university). Taking advantage of its location in Tsukuba Science City where there are more than 300 national and private research institutes, the University of Tsukuba has extended research and education cooperation including Cooperation Graduate School Programs. In order to achieve the mission of "Contributing to solving the global issues we face today through research and education" and “Developing human capital that leads to the resolution of these issues”, the University of Tsukuba implements degree programs such as Sustainability Science; Technology and Policy Program; Bachelor’s Program in Global Issues; and Program in Economic and Public Policy. Starting from North Africa, research and academic cooperation with Africa has been emphasized. In 2004, the Alliance for Research on the Mediterranean and North Africa was established for promoting trans-disciplinary research on the Mediterranean and North African region, which has achieved many research collaboration projects including SATREPS. In addition, researchers of the university extend their research activities all over the Africa. On the other hand, the University of Tsukuba has engaged in networking among Japanese universities interested in academic exchange with Africa and between Japanese and African universities. In this presentation, I overview the academic activities of the University of Tsukuba, especially cooperation with Africa in order to contribute to the solution of global issues and human capital development for sustainable society.

Biography:
Dr Takahiro Morio
Professor, Office of Global Initiatives
University of Tsukuba
Japan

As Professor in the Office of Global Initiatives, Dr Takahiro Morio is involved in planning the international academic cooperation strategy of the University of Tsukuba and the coordination of academic exchange with universities of African countries. His current research topics are innovation, higher education and contents business in Africa.

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CONSTRUCTING A DEEP “INTER-DISCIPLINARY STUDY”: THE ATTEMPT OF DOSHISHA UNIVERSITY’S GLOBAL STUDIES PROGRAM

Nakanishi, H
(Doshisha University, Japan)

Researcher

The objective of my talk is to present how the Graduate School of Global Studies of Doshisha University (Kyoto, Japan) has endeavored to construct an interdisciplinary study program since its establishment in April 2010. The program of our school has three characteristics. First is to familiarize the students with so-called cross-cutting concepts such as climate change, human security, gender equality, poverty mitigation and entrepreneurship in emerging economics. The second is to teach research methodologies in which the students learn at least one or two major academic disciplines and study how to integrate different disciplines for their research topics. The third characteristic is to sensitize the students to the gap between academic and often conventional theories and the realities of people living in the globalized rapidly changing world. Our program provides the students with the conducting of field research and participation in internship programs. Thus, the GS program attempts to establish a distinguished interdisciplinary research program which requires the students to think critically and analyze global issues deeply and to develop their career paths with innovative visions.

Biography:
Dr Hisae Nakanishi
Professor, Graduate School of Global Studies
Doshisha University
Kyoto, Japan

Dr Hisae obtained her PhD in History at UCLA in 1994. Since joining Doshisha University, she has been involved in research on conflict mitigation in the Middle East, and gender and development. She worked for the Japan Commission for UNESCO from 2005 to 2011. She was Professor of the Graduate School of International Development at Nagoya University from 2001 to 2010 and Dean from 2004 to 2006.

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INTERNATIONAL SERVICE-LEARNING EXPERIENCES AT INTERNATIONAL CHRISTIAN UNIVERSITY IN JAPAN

Nishimura, M
(International Christian University, Japan)

Researcher

International Christian University is a liberal arts university situated on the outskirts of Tokyo and is the first university in Japan that offered service learning courses in 1996. ICU established the Service-Learning Center in 2002 and leads the Service-Learning Asia Network (SLAN) with Asian universities. The core values of liberal arts education are closely tied to the student’s experience as a critical thinker and a future change agent of the world. Practices pay much attention to generating critical thinking, interdisciplinary and integrated learning, civic engagement with a sense of social justice and equity, and deep understanding of various cultural and theoretical perspectives. Service-learning plays a pivotal role as experiential learning to embody these core values of liberal arts education. Nevertheless, service-learning can be susceptible to cultural or volunteer tourism associated with a saviour complex if students lack awareness of privileges, positionality, and the concentric circle of local and global issues. Critical reflection on experiences is essential for revision of one’s own ways of thinking, being and acting to promote and sustain a continuous learning cycle of action and reflection. In this presentation, I will explain ICU’s history and philosophy of service-learning programs and raise some important questions to be asked before and after entering a community for critical thinking and reflective learning. ICU is also looking for partners in Africa to pursue mutually beneficial service-learning programs.

Biography:
Dr Mikiko Nishimura
Professor, Department of Education and Language Education
Director, Service-Learning Center
College of Liberal Arts, International Christian University
Japan

Prior to her current position, Mikiko was Associate Professor at the Graduate School of International Cooperation Studies at Kobe University. Her primary research interests are analysis of education reforms and policies, community participation and accountability in education, gender in education, and internationalization of higher education. She has worked extensively in educational planning and research in Sub-Saharan Africa.

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INTERNATIONALISATION AT WITS UNIVERSITY

Moolla, M
(University of the Witwatersrand, South Africa)

The University of the Witwatersrand (Wits), based in Johannesburg, is one of only two universities on the continent of Africa that consistently appear in the Top 300 list of major ranking universities. As such, we receive a number of requests for collaborations and visits. In the first part of this presentation, I will explain our internationalization strategy and how we deal with these requests that have mushroomed over the last few years. The second part of the talk will discuss the types of collaboration that the university has entered into and also what we are planning to do in the next few years.

Biography:
Dr Mahomed Moolla
Head, Strategic Partnerships
University of the Witwatersrand
South Africa

Mahomed is Head of the Strategic Partnerships Office at Wits University which deals with all local and international partnerships. It is also responsible for hosting visitors to the university. By training Mahomed is a Science Education specialist and he lectures at the Wits Education Campus.

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The aim of this paper is to address the current impact of the new curriculum changes at DUT within teaching, assessment and learning of skills subjects and the impact these have on industry. This research will speak to the themes of UoT structural changes; needs of industry (local); mentorship of students; work preparedness of students; and future student leaders. In this era of ongoing new developments in curriculum, it is imperative to find out how new changes will affect the teaching and learning of a skills curriculum. The continuous changes that are taking place in skills curriculum demand the need for this research. Questionnaires will be used as data collection using both qualitative and quantitative methods. There is a perception that DUT’s Work Integrated Learning (WIL) academics feel that it is not necessary for them to change the way they educate, especially those who did not receive training in the new curriculum during their tertiary education. Lack of resources impact negatively on the implementation of curriculum reform in teaching and learning of skills in many under-resourced departments. It is not easy for subject advisors to give relevant support due to a lack of human capacity. Lack of skills, knowledge and pre-planning on new curriculum development adversely affect the teaching and learning of skills at DUT. It is therefore recommended that the proposed curriculum development and reform be piloted before it is implemented as proposed in the model for the preparation of effective curriculum changes and development in skills. It is important to have functional curriculum support and departmental forums at DUT. The provisioning of skills centres with well-equipped laboratories in each and every faculty at DUT will play a significant role in effective teaching and learning of skills at the university.

**Biography:**
Mr Chunderpaul (Jay) Paramanund  
EIP Coordinator, Department of Cooperative Education  
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Since joining the DUT in 1983, I have been involved and specialising in EIP training and Work Integrated Learning.

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AFRICAN STUDIES IN TOKYO UNIVERSITY OF FOREIGN STUDIES

Takeuchi, S  
Matsunami, Y, Kirikoshi, H  
(Tokyo University of Foreign Studies, Japan)

Researcher

Tokyo University of Foreign Studies (TUFS) specializes in studies of foreign languages and related area studies. Currently, 28 languages are taught as major and 46 languages as minor subjects. It has a long history of African studies. The Research Institute for Languages and Cultures of Asia and Africa (ILCAA), which was founded in 1964 as the first research institute of African studies in Japan, has a number of linguists, anthropologists, and historians on Africa. In 2012, TUFS launched an African studies course at undergraduate level. Around 15 students willing to engage with Africa join the course every year. In addition, the African Studies Center (ASC) was established in 2017. Focusing mainly on contemporary African challenges with regard to development, the ASC aims at being a center not only for research but also for the networking of African studies in Japan. Through activities such as a joint seminar and the exchange of researchers as well as students, it promotes academic exchanges with universities and research institutes in Africa including the University of Pretoria, University of Cape Town, University of Ghana, Protestant Institute of Arts and Social Sciences (Rwanda), and Université de Yaounde II (Cameroon). In collaboration with these institutions, the ASC-TUFS has been carrying out a joint research with regard to resource management and political power in rural Africa since 2018.

Biography:
Dr Shinichi Takeuchi  
Director, African Studies Center  
Tokyo University of Foreign Studies  
Japan

Shinichi Takeuchi has carried out research at IDE-JETRO on political economy in Central African countries including Rwanda, Burundi, and the DRC. In April 2017, he joined TUFS to establish the African Studies Center. His academic interests cover such topics as conflict, peace-building and land issues.

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INDEX OF AUTHORS

<table>
<thead>
<tr>
<th>Author</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aminaka, A</td>
<td>29</td>
</tr>
<tr>
<td>Barnes, JR</td>
<td>50</td>
</tr>
<tr>
<td>Bothma, S</td>
<td>6</td>
</tr>
<tr>
<td>Cishe, EN</td>
<td>7</td>
</tr>
<tr>
<td>De Wit, MP</td>
<td>30</td>
</tr>
<tr>
<td>Durrheim, RJ</td>
<td>51</td>
</tr>
<tr>
<td>Hashimoto, M</td>
<td>8</td>
</tr>
<tr>
<td>Higuchi, H</td>
<td>31</td>
</tr>
<tr>
<td>Honda, A</td>
<td>9</td>
</tr>
<tr>
<td>Iizuka, M</td>
<td>33, 74</td>
</tr>
<tr>
<td>Ikeda, H</td>
<td>52</td>
</tr>
<tr>
<td>Ikeguchi, A</td>
<td>32</td>
</tr>
<tr>
<td>Ikenaka, YI</td>
<td>10</td>
</tr>
<tr>
<td>Ito, S</td>
<td>53</td>
</tr>
<tr>
<td>Izumi, M</td>
<td>75</td>
</tr>
<tr>
<td>Kabashima, H</td>
<td>34</td>
</tr>
<tr>
<td>Kanda, N</td>
<td>76</td>
</tr>
<tr>
<td>Kapute Mzuza, MM</td>
<td>11</td>
</tr>
<tr>
<td>Katsumata, A</td>
<td>12</td>
</tr>
<tr>
<td>Kusakabe, T</td>
<td>13</td>
</tr>
<tr>
<td>Lee, H</td>
<td>54</td>
</tr>
<tr>
<td>Mahlangu, DE</td>
<td>55</td>
</tr>
<tr>
<td>Makgopela, MTS</td>
<td>14, 15</td>
</tr>
<tr>
<td>Makhalanyane, T</td>
<td>56</td>
</tr>
<tr>
<td>Makino-Yamashita,K</td>
<td>35</td>
</tr>
<tr>
<td>Masunda, O</td>
<td>36</td>
</tr>
<tr>
<td>Matose, F</td>
<td>37</td>
</tr>
<tr>
<td>Matshavha, R</td>
<td>57</td>
</tr>
<tr>
<td>Memela, SN</td>
<td>16</td>
</tr>
<tr>
<td>Minakawa, N</td>
<td>17</td>
</tr>
<tr>
<td>Mizota, K</td>
<td>58</td>
</tr>
<tr>
<td>Mkhotongo, NE</td>
<td>59</td>
</tr>
<tr>
<td>Moolaa, M</td>
<td>80</td>
</tr>
<tr>
<td>Morio</td>
<td>60</td>
</tr>
<tr>
<td>Morio, T</td>
<td>77</td>
</tr>
<tr>
<td>Moshime, K</td>
<td>38</td>
</tr>
<tr>
<td>Mudimeli, LM</td>
<td>18</td>
</tr>
<tr>
<td>Musvipwa, FM</td>
<td>19</td>
</tr>
<tr>
<td>Nakanishi, H</td>
<td>39, 78</td>
</tr>
<tr>
<td>Nishimura, M</td>
<td>79</td>
</tr>
<tr>
<td>Nishiura, A</td>
<td>61</td>
</tr>
<tr>
<td>Nonaka, K</td>
<td>20, 62</td>
</tr>
<tr>
<td>Nubong, GF</td>
<td>63</td>
</tr>
<tr>
<td>Nunoura, T</td>
<td>64</td>
</tr>
<tr>
<td>Nzo, ZYZ</td>
<td>40</td>
</tr>
<tr>
<td>Ono, E</td>
<td>65</td>
</tr>
</tbody>
</table>