6th PIURN Pacific Islands Universities Regional Network CONFERENCE

PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

"Harnessing technologies for the safe and sustainable development of the Pacific"

Papua New Guinea University of Technology

BOOK OF ABSTRACTS

By PNG University of Technology Press
Private Mail Bag, Lae 411, Taraka Campus, Morobe Province, PNG

DOI. Being Applied.

Cover Image: Photo by Andreas Gücklhorn embracing-nature

Foreword

It is with great pride and deep appreciation that I present this Book of Abstracts for the Pacific Islands Universities Regional Network (PIURN) Conference, hosted this year by the Papua New Guinea University of Technology (PNGUoT). The theme, Harnessing Technologies for the Safe and Sustainable Development of the Pacific, reflects the critical moment we face as Pacific peoples—caught between immense opportunity and unprecedented challenges, and called to act with wisdom, unity, and foresight.

This compilation represents more than just academic inquiry—it captures the voice, vision, and vitality of over 150 researchers across our region and beyond. Each abstract is a testament to the growing research capacity of our universities, and a symbol of our collective determination to address the pressing issues that define our era. From rising sea levels and climate-induced food insecurity, to renewable energy solutions, and the enduring strength of cultural values and indigenous knowledge—this volume translates the complex landscape of Pacific realities with intellect and purpose.

The high number and quality of submissions is not merely a measure of scholarly output; it is evidence that the vision behind the establishment of PIURN is bearing fruit. Our regional network was created to foster collaboration, share resources, and translate academic excellence into tangible improvements for our societies. The participation of universities from Australia, New Zealand, and across the Pacific exemplifies the collaborative spirit that will be essential if we are to respond effectively to the shared developmental, environmental, and social challenges of our region.

Indeed, universities must lead—not only in knowledge generation but in shaping the next generation of thinkers, policymakers, and innovators. As custodians of knowledge, our professors, researchers, and postgraduate students have a solemn duty to engage deeply with their disciplines, while also contributing meaningfully to the betterment of our communities. Higher education must no longer sit on the sidelines of development—it must sit at the table of decision-making, providing evidence-based insights to guide sustainable, inclusive growth.

Our Pacific region is blessed with abundant natural resources—land, sea, minerals, energy—and rich cultural heritage. Yet we also face fragility: ecological, economic, and institutional. The UN Sustainable Development Goals remind us that growth must be balanced with responsibility; that innovation must walk hand-in-hand with equity and preservation. The research presented in this book points us in that direction, offering data, analysis, and solutions grounded in the realities of our people.

In closing, I commend the dedication of all contributors, and I challenge all stakeholders—academia, government, industry, and community—to draw from this collective knowledge to shape a Pacific future that is just, resilient, and sustainable.

Professor Ora Renagi, PhD
Vice Chancellor
Papua New Guinea University of Technology (PNGUoT)

Foreword

It is an absolute delight to present the 2025 PIURN Book of Abstracts under the theme, "Harnessing Technologies for the Safe and Sustainable Development of the Pacific." This collection brings together the voices, insights, and innovation of academics and practitioners who share a common goal: to explore how technology can be a transformative force for the future of our Pacific region.

As the Pacific faces unique challenges—from climate change to geographic isolation and resource constraints—technology offers unprecedented opportunities to overcome these barriers and foster resilience. Whether through digital connectivity, sustainable energy solutions, advanced data systems, or community-driven innovation, the work featured in these abstracts reflect a deep commitment to forging pathways that are not only safe and secure, but rooted in the values and aspirations of our people.

This volume stands as a testament to the power of collaborative inquiry and regional solidarity. Each abstract is a spark—offering a glimpse into ideas that have the potential to illuminate the Pacific's development journey in ways that are both inclusive and enduring.

We invite you to engage with these contributions, reflect on the possibilities they open, and join us in reimagining a Pacific that thrives through the thoughtful and ethical application of technology.

Professor Pal Ahluwalia
Vice-Chancellor and President
The University of the South Pacific

Professor Catherine Ris
President
University of New Caledonia

Extract – Australian Consul-General in Lae

Pacific Islands Universities Regional Network (PIURN) Conference

Australia is proud to be a long-standing partner in Papua New Guinea's (PNG) education and research journey. As PNG's *nambawan education partna* we collaborate to expand access to learning, improve digital connectivity, and strengthen institutional capacity.

Through initiatives such as the Australia Awards scholarships, we are investing in PNG's next generation of leaders—supporting scholars who return equipped with the skills and perspectives to address national and regional development challenges.

Our partnership extends beyond individual scholarships to include long-term collaboration with PNG universities—through grants, infrastructure support, and joint research that responds to Pacific priorities in health, education, governance, and technology. This cooperation is guided by the *Comprehensive Strategic and Economic Partnership* between Australia and Papua New Guinea and is underpinned by a shared commitment to inclusivity, innovation, and sustainable progress.

This year's designation of all PNG's Australia Awards recipients as *Somare-Whitlam Scholars* reflects our deep respect for the shared history and enduring values between our countries. In 2025, PNG's golden jubilee year, the Australian High Commission's Yumi Stap Wantaim campaign is highlighting the breadth and depth of our modern partnership as both regional neighbours and wantoks.

The Australian Government remains committed to working with Pacific institutions to ensure that access to technology, quality education, and research opportunities are extended to all—particularly women, people with disabilities, and those in remote communities.

As Australia's Consul-General in Lae, it would be remiss of me not to mention the significance of this conference being held here. As the country's second-largest city, the national economic hub, and gateway to the highlands and islands, Lae represents the very best of modern PNG. It is city with a proud academic heritage, as a reflection of Papua New Guinea's growing leadership in global academic and development dialogue.

Congratulations to Papua New Guinea University of Technology for hosting this important regional event.

REMARKS FROM THE CHAIRPERSON - ORGANISING COMMITTEE

The 6th PIURN Conference 2025 is hosted by the Papua New Guinea University of Technology (PNGUoT). Similar to previous series of the same conference being hosted in different Institutions in different countries over the past years, the expectations of the Committee were to organize something similar to the PIURN tradition. We have several Speakers and Paper Presenters from the pacific and international community who will join us in person and virtually for the three days conference.

Hard work and Teamwork have made it a success. **Finally it is here!**

I take this opportunity to sincerely thank the PNGUoT Joint Organizing and Editorial Committee for their tireless efforts and undivided cooperation from the very beginning till the end.

I sincerely thank the PIURN Coordinator, Ms Mathilde Souchon for the fundraising and coordination of the entire planning and implementation of the conference.

Thanks are due also to the PNGUoT Senior Executive Management and the Bursary Team for their support towards timely allocation of funds for organizing of logistics.

I gratefully thank the sponsors who willingly supported in cash and in kind towards the organizing of the conference. We would not have set the stage for this Conference without your support.

Finally, I am delighted to welcome the VIPs including, vice chancellors of other universities in the pacific who are members of the PIURN family.

Enjoy the Conference!

Veronica Bue, PhD

Editorial

Halo olgeta, Mālō e lelei, Bula, Namaste, Kia Orana, Talofa, ...Hello and Bonjour,
With humility, the PNGUoT Conference Organization and Editorial Team is delighted to bring to the Pacific Community and the global audience, the “book of abstracts” for the 6th Pacific Islands Universities Regional Network (PIURN) Conference 2025.
We owe a heartfelt thanks to the authors of the 187 abstract submissions (from several countries of the pacific and beyond) and we also thank the (PIURN) office for allowing us to host the 2025 conference at PNGUoT.
In the tradition of the conference, the scope of the submissions (spanning our 7 Themes and several sub-themes) are interdisciplinary and inclusive of all areas of interest to our region.... from science to traditional beliefs.
Dear readers, please enjoy. All feedbacks are welcomed.
My team and I are indebted to the academics who gave their valuable time to provide the peer reviews of the authors’ submissions and Ms Mathilde Souchon (PIURN office) for the excellent website management assistance.
And to the numerous donors and sponsors, too large to list, we are honoured and we are grateful!

Sincerely,
Dapsy Olatona: Chair, Editorial Committee (23/6/2025)

Table of contents

1 Course, 13 Nations: Practical Takeaways for Networked Course Design and Delivery – A Model for Pacific Island Universities

K. Kathleen O'neill * [1], Janara Kangeldieva *

[2]

[1] Innovative University of Enga – Papua New Guinea
[2] American University of Central Asia – Kyrgyzstan

Participants will leave this engaging and interactive session with a model that meets the needs of Pacific Island universities: **networked courses**. In this time of limited financial and faculty resources - yet with growing demand for curricular expansion - networked courses offer an efficient and effective solution.
Using the experience of the presenters teaching on two Open Society University Network courses (*Social Entrepreneurship*-fall 2024, *Leading Change for Sustainability*-spring 2025) that included included 12 faculty and more than 150 students representing 13 nations (Iraq, Kyrgyzstan, Bulgaria, Lithuania, USA, Afghanistan, South Africa, Netherlands, Philippines, Palestine, Bangladesh, Spain, Germany), the session will focus on usable tips and takeaways for faculty and administrators who wish to launch or enhance their own globally networked courses.

In addition to offering a cost-effective way to expand course offerings and access faculty expertise, the presenters will share more benefits of networked courses (e.g., student improvements in innovative thinking, problem-solving skills, cross-cultural communication, resilience, technology competency) as well as challenges encountered by students, faculty, and administrators (e.g., cultural differences, language barriers, infrastructure, geo-political events). The session will also address steps that were taken to mitigate cultural homogeneity and dominance.
Participants are encouraged to bring questions about – and their own experiences with – pedagogy in globally networked courses, organizational and administrative considerations in globally networked courses, task coordination, and relationship management when working across time zones, cultures, languages, academic disciplines, and institutions.

Keywords: Networked courses, Collaboration, Curriculum, Faculty, Student learning, Sustainability, Social Entrepreneurship, Technology

*Speaker

A Review of Agroforestry-Phytoremediation Systems for Land Restoration and Livelihood Enhancement: Insights for the Porgera Mine Environment, Papua New Guinea

Stanley Rungwa * [1], Kumar Yekula Prasanna [2], William Unsworth [3], David Timi [2], Anthony Harakuwe [4]

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[4] University of Goroka – Papua New Guinea

The Porgera Mine region in Papua New Guinea (PNG) has faced significant environmental degradation due to decades of intensive gold mining activities, leading to widespread contamination of soil and water with heavy metals such as mercury, arsenic, and lead. These pollutants pose serious ecological and public health risks while simultaneously undermining the land's agricultural productivity and the livelihoods of local communities. In response to these challenges, integrated approaches that combine environmental restoration with socio-economic development are gaining attention. This review explores the potential of agroforestry-phytoremediation systems as a sustainable strategy for rehabilitating heavy metal-contaminated lands, with particular relevance to the Porgera context. Drawing on a broad body of literature, the paper synthesizes knowledge on the mechanisms and effectiveness of phytoremediation-particularly phytoextraction and phytostabilization-using native and non-native plant species. It further examines how agroforestry systems, when carefully designed, can complement phytoremediation efforts by enhancing soil structure, providing biomass, supporting biodiversity, and generating income through crops, fuelwood, and non-timber forest products. Several global case studies are analyzed to identify best practices, species selection criteria, and socio-economic outcomes. The paper also evaluates the feasibility of implementing such systems in the Porgera region, considering local ecological conditions, land use dynamics, and community engagement. The review identifies key gaps in current research, including the need for region-specific data on metal uptake capacities of local species, long-term monitoring frameworks, and participatory models for involving indigenous communities. Ultimately, this paper offers a conceptual foundation for future research and policy development aimed at coupling environmental remediation with livelihood enhancement in mining-affected regions. The findings are intended to support stakeholders-including researchers, land managers, and policymakers-in adopting integrated, low-cost, and community-driven solutions for sustainable land restoration in PNG and similar settings.

Keywords: agroforestry, phytoremediation, heavy metals, plant species, environmental, land restoration.

*Speaker

A Review on the Role of Green Manure in Sustaining Soil Fertility and Crop Productivity in Papua New Guinea

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Organic carbon in soil plays crucial role in various soil processes, nutrient dynamics, water relations, and maintaining biological and physical health of the soil, ultimately determining the soil productivity. Optimum levels of soil organic carbon can be managed through the adoption of appropriate organic amendments. Among the many organic soil amendment practices, green manuring is a promising and climate-friendly technology for increasing organic matter content in the soil. The incorporation of green manure (GM) not only addresses the issues of timely access to suitable fertilizers, the raising cost of chemical fertilizers, and their environmental problems when incorrectly used, but also maintains the soil's fertility, prevents soil erosion, improves physico-chemical properties of soil, suppresses weeds, conserves soil water, and enhances crop productivity. This review highlights various beneficial effects of green manures and the challenges in the integration of green manures into PNG cropping systems.

Keywords: Green manure, soil organic carbon, soil fertility

*Speaker

A comparative assessment of marita (Pandanus conoideus) and its production challenges and opportunities for further research and development in Papua New Guinea

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Despite being a high-value native crop, marita (Pandanus conoideus) has received little research and development attention in Papua New Guinea (PNG). Studies in Indonesia have confirmed that marita oil contains natural antioxidants, including carotenoids, tocopherol, omega-3 and omega-6 fatty acids, and anti-inflammatory properties beneficial to human health. In PNG, marita holds cultural significance and economic value as it is used in traditional rituals, bride price payments, and barter systems as a special gift, and it serves as a source of income for many families. The literature further shows that most information is on background, especially distribution, cultural significance, and food sources like oil and sauce. Unpublished reports in PNG show twenty-four varieties were found in Lumi, West Sepik Province, eighteen different accessions in Jiwaka, and four in the Nipa-Kutubu area in the SHP. This shows a diversity of marita exist in PNG, and studies need to be conducted on agronomic practices, pest and disease management, nutritional and chemical compositions, and molecular diversity analysis. This study aims to establish that marita is an underutilized crop in PNG, and there is a need to study diversity nationwide, its socio-economic, cultural, and nutritional importance, and wider cultivation as an alternative crop under climate change.

Keywords: marita, characterisation, morphological, diversity, and physic, chemical

*Speaker

A culturally responsive technology-enabled learning platform for Vanuatu primary school in-service teachers by Effrel Toara Morris, School of Education, National University of Vanuatu

Effrel Morris * [1]

[1] National University of Vanuatu – Vanuatu

A culturally responsive technology-enabled learning platform for Vanuatu primary school in-service teachers.
Effrel Morris

School of Education

National University of Vanuatu

Abstract

In Vanuatu, where teachers are often dispersed across multiple islands with limited access to in-person professional development opportunities, upgrading qualifications can be a significant challenge. This paper reports on the development and implementation of a technology-enabled learning platform designed to support in-service teachers in Vanuatu in gaining higher qualifications as envisioned by the Vanuatu Government to promote sustainable development.

The learning platform was built on Moodle, an open-source learning management system. It provides flexible, blended learning opportunities that include online coursework, interactive learning materials, and community-based assignments. To be safe and sustainable, the platform is developed in such a way that is congruent to the Vanuatu learning culture including traditional knowledge systems, local case studies, and bilingual instructional content in English, French, and Bislama. Further, the platform is designed to support offline access to teachers in remote areas.

In-service Primary teachers were selected from across the 6 provinces for the initial rollout of this learning platform. The results were promising in that they showed an increased teacher engagement, improved digital literacy, and greater alignment between formal education goals and indigenous knowledge frameworks. Bridging technological innovation with the inclusion of cultural learning promotes a sustainable model for professional development in Vanuatu's education sector. This paper discusses how the learning platform was developed and how the initial implementation was carried out, yielding the results.

*Speaker

Keywords: Vanuatu, in, service teachers, blended learning, educational technology, indigenous knowledge, professional development, sustainable education

A descriptive study on the challenges faced in delivering and coordinating the Postgraduate master's in education leadership and Change (MELC) program at the Faculty of Education and Humanities, Solomon Islands National University (SINU)

Emelda Ariku * [1]

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The purpose of this study was to identify the challenges faced in effective delivery and coordination of the Postgraduate Master of Education Leadership and Change (MELC) program at the Faculty of Education and Humanities, SINU. Moreover, the study was conducted to explore ways to address the challenges identified.
The philosophy underlying to this study is interpretivism. Hence, qualitative methodology was used. Data was collected using one-to-one interviews using semi-structured questions. Data was analyzed using thematic analysis.

The study found out that MELC program is an excellent program but there are many challenges that are contributing to ineffective delivery and coordination of the program. These challenges include; lack of teaching and learning materials for students and staff, poor infrastructure, and lack of support from the FEH administration office. Furthermore, inadequate staff, use of outdated guide books, limited knowledge on the use of technology (MOODLE), communication barriers, and lack of coordinating experiences are some of the challenges faced at FEH, SINU. Hence, more emphasis is needed in addressing these challenges identified especially by improving the infrastructure, providing appropriate teaching and learning resources, involving an experienced staff to coordinate the program, and most significantly by incorporating the Postgraduate Degree by research policy into the program. Moreover, by being up to date with the use of technology especially in delivering the lessons and using updated teaching guidebooks will enhance the effective delivery and cordinaton of the program. In doing so, all these challenges will be addressed accordingly.

*Speaker

Keywords: Challenges, delivery, coordination, MELC, FEH, SINU

A water balance assessment of the drying trend of groundwater-dependent Lake Haramaya and the potential role of soil and water conservation in its restoration.

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[1] The Papua New Guinea University of Technology – Papua New Guinea

Lakes in dry and semi-arid regions, especially those that rely on groundwater, are at risk of shrinking or disappearing due to human activity and climate change. This study focuses on Lake Haramaya, which is located in Ethiopia's East Hararge region and has seen a considerable fall in water levels. Understanding the dynamics of water resources in a sub basin, particularly in terms of soil and water conservation (SWC) practices, is critical for developing efficient restoration plans. This study looks at the geographical and temporal changes of surface and groundwater resources in the Lake Haramaya sub basin, as well as the effects of different SWC methods on water infiltration, soil moisture retention, and surface runoff. Using the WetSpass model to assess the water balance components, the study finds a mean annual evapotranspiration of 473.97 mm, surface runoff of 257.7 mm, and a significantly low groundwater recharge of 17.15 mm, accounting for only 2.5% of total precipitation. The findings indicate the considerable fraction of precipitation lost to evapotranspiration (69%) and surface runoff (26.8%), implying that water percolation is insufficient to recharge the groundwater system that supports Lake Haramaya. Understanding these water balance dynamics, as well as the impact of current and planned SWC interventions, is crucial for creating focused methods to improve groundwater recharge and, ultimately, contribute to the restoration of the vital Lake Haramaya ecosystem.

Keywords: Surface Runoff, Groundwater Recharge, WetSpass, Lake Haramaya, Soil and Water Conservation, Lake Restoration.

*Speaker

ACID TREATED BETEL NUT HUSK FOR DYE REMOVAL: ADSORBENT CHARACTERIZATION, ADSORPTION ISOTHERMS AND KINETIC STUDIES.

Kaupa Philip * [1], Salvina Ku *

1

[1] The Papua New Guinea University of Technology – Papua New Guinea

Synthetic dyes released into water bodies through various industrial activities are persistent pollutants that are not easily degradable, thus posing long-term environmental hazards. In light of these, several technologies have been investigated. Among them, adsorption has gained popularity due to being cost-effective, highly efficient, simplicity of design, and economically feasible. In this research, the adsorption of Methylene Blue (MB) dye onto acid functionalized betel nut husk (AFBNH) was investigated by varying adsorption parameters such as contact time, initial concentration and pH. The adsorption of methylene blue (MB) onto AFBNH was observed to be relatively slow, requiring approximately 6.5 hours to attain equilibrium. The adsorption was low at lower dye concentration but increases rapidly as concentration increases removing up to 87% of the dye from solution. The dye removal was low at lower pH and increases as the pH increases removing up to 90% of dye, thus indicating the adsorption favoured basic conditions. The adsorption data fitted well with Freundlich isotherm with R2 value of 0.99, which indicated that the surface energy of AFBNH varies and the adsorption was multi-layer. The adsorption data fitted pseudo-second-order kinetic models well indicated that the process is controlled by chemisorption in which the adsorption process is defined by electron exchange or sharing between the adsorbent and adsorbate. Various functional groups were identified from the FTIR spectra. These functional groups were assumed to bind the dyes through chemisorption process as deduced from the kinetic and isotherm studies. The SEM image reveals a rough, porous, and fibrous surface morphology of the powdered betel nut husk, which provides abundant active sites and high surface area, contributing to its high adsorption capacity.

Keywords: Methylene blue, acid, functionalized betel nut husk, adsorption, wastewater treatment, Freundlich isotherm, pseudo, second, order kinetics, chemisorption, surface morphology.

*Speaker

AI-Driven Cherry Ripeness for Enhancing the Competitiveness of Arabica Coffee Industry in Papua New Guinea

Guofu Chen * [1]

[1] The Papua New Guinea University of Technology – Papua New Guinea

The Arabica coffee industry is a vital contributor to Papua New Guinea's (PNG) export revenue, sustaining thousands of rural livelihoods. However, in recent years, PNG's competitiveness in the global coffee market has declined relative to major producers in Latin America and Southeast Asia, who have strategically adopted artificial intelligence (AI) technologies to optimize production and quality. One key area of advancement is the use of computer vision (CV) to support precision harvesting by accurately detecting and selecting optimally ripe coffee cherries, a process critical to the final quality of roasted beans. Despite promising results globally, CV models trained on coffee fruits from one region often under-perform when applied in other growing environments due to regional variations in climate, altitude, soil composition, disease pressures, and cultivar morphology. Compounding this issue, even state-of-the-art CV algorithms that outperform others in one region may yield inferior results when benchmarked elsewhere. Currently, no such AI tools or CV models have been developed or validated for Arabica coffee grown in PNG. This research aims to fill this critical technological gap by developing a robust, regionally adapted CV model tailored to PNG's unique coffee-growing conditions. The study will involve (i) capturing and annotating a comprehensive image dataset of Arabica coffee cherries across multiple PNG regions, (ii) evaluating existing CV architectures for regional performance benchmarking, and (iii) designing and training a custom model optimized for the specific visual cues of PNG-grown Arabica. The outcome will support precision harvesting practices among local farmers, contributing to consistent quality improvements and strengthening PNG's position in the global specialty coffee market.

Keywords: Coffee, CNN, AI, Computer vision, Papua New Guinea

*Speaker

Academic Research and University Outreach, a few case studies in Madang (Papua New Guinea)

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Building research projects in the Pacific Islands that could be noticed at an international level is particularly challenging: our geographical isolation, the lack of funds, our financial dependence on internationally driven research agendas and the limited echo that our research meets within our respective countries in the region tend to marginalise our efforts. It is therefore of critical importance to design projects in which originality and insightfulness may compensate for hindering factors.
In the last two years, I have wondered to what extent outreach programs that address the specific social configurations and needs of groups of people living near our university locations could expose our universities and our research endeavour and be noticed by major research players worldwide. Such projects are supposed to partly merge social engagement and high academic expertise.

The paper considers how academic expertise can bring tangible improvement and offer disadvantaged populations better living conditions. It is based on recent projects developed by Divine Word University's Centre for Social Research since 2023. It will assess what was done, what could have been done, and the limitations of such programs.

We will develop our reflection on three case studies: an educational project with local prisoners, an adult literacy project for women, and a creative art project related to environmental protection.
In doing so, we question contemporary institutional capacity, some of the key needs of the country and the way international agency can cope (or not) to some of the dire social issues in the country. We will consider the difficulty to access funds, the reaction of the academic world towards such project and their possible impact on contemporary international academic debates.

Keywords: outreach, academic research, creative arts, academic visibility, innovation

*Speaker

Adolescents' use of digital technology for health: Insights from New Caledonia

Krestina, L. Amon * [1], Rowena Forsyth [1], Louisa Peralta [1], Stephanie, R. Partridge [1], Juliana Chen [1], Guillaume Wattelez [2], Olivier Galy [2], Corinne Caillaud [1]

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[2] University of New Caledonia – New Caledonia

INTRODUCTION: Adolescents worldwide increasingly use digital technology (eg. online platforms) for health. With limited evidence from the Pacific Islands Countries and Territories, it is crucial to understand how adolescents in these regions use online platforms for health. By examining their patterns of use and reasons for engagement, effective educational initiatives and interventions tailored to their needs can be developed.
OBJECTIVES: This cross-sectional study aimed to explore the use of digital technology for health by adolescents in New Caledonia.

METHODOLOGY: Participants used classroom computers to complete an online questionnaire through RedCap. Data was collected in Noumea and Lifou in 2023 by researchers from the University of Sydney and the University of New Caledonia. Classes were selected based on teacher interest and consent.

RESULTS: Year 7 and 8 students (mean= 12.8 years) from 3 schools participated, collecting 144 responses on their digital technology use for health. Findings reveal that participants owned social media accounts for TikTok (73.2%), Instagram (61.9%), Snapchat (54.2%), Facebook (52.8%), and YouTube (52.1%). Participants used apps, social media, or websites (31.7%) to search health-related information. Important factors when using a health-related app or website are that it is free (75.5%) and easy to use (66.6%). Participants trust content from a government website (45.7%), someone they trust (41.5%), or if recommended by a teacher or community leader (35.9%). Almost half (42.3%) reported not having checked the accuracy of the information. Other participants ask friends or family (38.0%), check other online sources (35.9%), or other social media platforms (20.4%). Participants (48.9%) reported that using social media helped them make changes to their health.
CONCLUSION: Almost one-third of young adolescents use online platforms to search and discuss health information, prioritising social media that are freely accessible, acknowledging some benefits to their health. Our findings add to the growing body of evidence of digital health in New Caledonia and identify key information to tailor the development of interventions that resonate with specific needs in a Pacific context. This evidence may enhance the overall health outcomes of adolescents and improve their digital health literacy, empowering them to effectively navigate and use digital health resources.

Keywords: Adolescents, digital technology, social media, health, New Caledonia

*Speaker

Advances in air quality research in Pacific Island Countries: Current and emerging challenges

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Recent air quality assessments carried out in Fiji and Solomon Islands revealed that particulate matter (PM10 and PM2.5) emissions in these countries exceeded the Air Quality Guidelines (AQG) stipulated by World Health Organisation (WHO). PM2.5, PM10 and weather data were collected from Honiara, Solomon Islands (February 2020-August 2023), Suva, Fiji (April 2021-August 2023) and Lautoka, Fiji (2023 – 2024).The results obtained for PM2.5 is 2 times more than the AQG in Suva and 4 times more than the AQG in Honiara. Lautoka City had the worst air quality with mean PM2.5 values exceeding the AQG by 5 times during non-harvesting sugarcane season and by 8 times during the harvesting sugarcane season. During the harvesting season the geometric mean of PM2.5 concentration was 123 ± 73 μg/m3 whereas the geometric mean concentrations during the non-harvesting season was 80 ± 40 μg/m3. Further analysis showed that 92% of samples exceeded 2021 WHO AQG of daily mean of 15 μg/m3 and achieving an annual 2021 WHO AQG of 5 μg/m3 would be challenging for all cities studied in the Pacific. Earlier studies at Lautoka City did the elemental characterization of PM2.5 and health risk assessments (Carcinogenic Risk (CR) and Non-Carcinogenic Risk (HQ)) were done to assess the risk of inhalation exposure in adults and children. The Hazard Index for children in Lautoka (HI = 1.03) was found to slightly exceed the safe level of 1. The main source of PM pollutants in Lautoka and Suva is combustion and would emit black carbon as well which is regarded as a Short Lived Climate Pollutant (SCLP). In Fiji, the National Air Quality Guidelines do not regulate PM2.5 but only PM10 and the regulation is very outdated. There needs to be more stringent policies guided by long-term monitoring to curb air pollution in Fiji and Solomon Islands. This presentation will also discuss some mitigation options for a small island developing state (SIDS).

Keywords: Air pollution, Pacific island cities, particulate matter emissions, public health, air quality guidelines, policy and regulations

*Speaker

Advancing the Aerospace Sector in the Pacific

George Carter * [1]

[1] George Carter – Samoa

The Pacific islands region covers one third of the globe, and strategically located across the vast Pacific Ocean. Despite the vast region's dependence on space technology for communication, climate change data and information, and emerging space technologies - there is neither a coordinated space sector in the Pacific islands region, nor is space prioritised within states and territories policies. This leads to their low participation and engagement with space- enabled benefits to prosperity and security.Earth Observation continues to be highlighted as providing the greatest impact to Pacific Island nation climate resilience, environmental protection and economic development. Furthermore, there is a technology-enabled trend toward business-to-consumer (for data, communications, positioning, sensing information, navigation). There is evermore opportunity for citizens of the Pacific Island nations to participate in space as either consumers of space-enabled services and data, or potential space business owners.The limited Pacific Island involvement in space activities is not fully understood and is commonly thought to be a result of financial constraints, a lack of technical expertise and insufficient infrastructure. Moreover, there is a concern that as space industry grows around the Pacific rim countries in Asia and the Americas extending space technology and access to their ecosystems – space geostrategies will further complicate an already overcrowded geopolitics of the region. This paper builds the case for advancing the Aerospace Sector in the Pacific Islands region.

Keywords: Space, Aerospace, Pacific, Oceania, Regionalism, Indigenous, Innovation, Industry, Climate Change, Geopolitics, Diplomacy

*Speaker

Age and growth of the shortfin mako shark (Isurus oxyrinchus) in the North Pacific Ocean: A Muilti-model Approach

Goriga Gwaibo * [1,2]

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This study investigates the age and growth parameters of the shortfin mako sharks (Isurus oxyrinchus) in the North Pacific. Vertebrae samples (n = 314) in the precaudal region, collected from Taiwanese large-scale tuna longline fisheries (2016–2024), were sectioned and analyzed under two hypothesized growth scenarios: (1) annual band-pair deposition throughout life and (2) biannual deposition for the first five years followed by annual deposition. Centrum edge analysis supported Scenario 1, validating annual band-pair deposition across all life stages. Marginal increment analysis, however, found no significant differences in vertebral growth between months or seasons, offering limited evidence for seasonal banding patterns. The band-pair counts ranged from 0 to 34 and 0 to 33 for females and males, respectively. Growth parameters were estimated using four growth models; von Bertalanffy (VBGF), 2-parameter VBGF, Robertson, and Gompertz model, with the VBGF selected as the best fit based on AIC. For Scenario 1, females exhibited $L\infty$ = 357.3cm, k = 0.037year–1 and t0 = -6.54 years, while males showed $L\infty$ = 254.9 cm, k = 0.064year–1 and t0 = -5.66 years. In Scenario 2, females showed $L\infty$ = 289.2cm, k = 0.077 year–1 and t0 = -4.98 years, while males exhibited $L\infty$ = 226.7cm, k = 0.129 year–1, and t0 = -3.91 years. Significant sexual dimorphism was observed, with females growing larger but more slowly than males. These findings emphasize the regional differences in the growth dynamics of the species and highlight the need for accurate age validation to inform effective fisheries management.

Keywords: Shortfin mako, Isurus oxyrinchus, age and growth, vertebral band, pair, age validation, marginal increment analysis, North Pacific Ocean

*Speaker

Albacore tuna (Thunnus alalunga) habitat and variability in French Polynesia

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Albacore tuna is important for the economy and food industry of French Polynesia. Nowadays, it represents 55% of the offshore fishery. With its lower resilience to climate change, relative to other tuna species, albacore requires focused study. This study investigates albacore's spatial distribution and relative abundance within the FP Exclusive Economic Zone (FP-EEZ) by analysing monthly fishery data from 2000 to 2022. Environmental parameters influencing Catch Per Unit Effort (CPUE) are assessed using a Generalized Additive Model (GAM) to define preferred habitat of albacore tuna. The parameters include sea surface temperature (SST), dissolved oxygen (DO) at 100m, chlorophyll concentration (Chl), sea surface salinity (SSS), and zonal and meridional currents. GAMs have the possibility to analyses past data in order to create a model that can predict on short and long-term time scale. Our results reveal a clear seasonal variability with a peak between May and December, and a pronounced interannual variation linked to El Niño Southern Oscillation. Our data show that part of the FP-EEZ is a spawning ground for albacore tuna, providing critical insights for sustainable fisheries management. GAM is a powerful tool to help making decisions as for a proper management of fishery resource in French Polynesia EEZ.

Keywords: Albacore tuna, Fisheries management, Generalized additive model, Spatial distribution, French Polynesia EEZ

*Speaker

Algebraic word problem solving competencies: A case study of pre-service student teachers

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Have you ever observed the look of confusion on a student's face when they encounter a math word problem? It is a common sight in classrooms everywhere. The main hurdle in solving math word problems is not just the mathematical representation but understanding how to translate the words into mathematical equations that can be solved. Successfully solving mathematical word problems requires simultaneous competency in algebraic representation and problem comprehension skills. This study examined the algebraic problem comprehension skills demonstrated by the students in solving mathematical word problems. The qualitative descriptive study design was used to get an overview of the algebraic problem comprehension competency in thirty-five pre-service student teachers (years 1 to 3) from Divine Word University, Wewak Campus. Each of the participants was given a test that contained word problems. The Newman's Error Analysis Technique was used to analyze the types of errors that were made. The result showed that students had difficulty understanding what the problem was asking. The students would have solved the problems accordingly had they comprehended the key variables in the problems. Based on this study, it is proposed here that problem comprehension skills need to be given equal attention like mathematical skills during algebraic problem solving instructions.

Keywords: Mathematics, algebra, word problems

*Speaker

Aligning University Courses to the PNG Government Digital Plan, A Challenge for the Universities in PNG.

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The Papua New Guinea Government Digital Plan 2023-2027 has set the path for its digital future agenda, focusing on transforming public service delivery, improve e-governance and build the national digital ecosystem. The Department of Information and Communications Technology (DICT) as the lead government department has developed this plan as well as supporting policy documents such as the Government Cloud Policy, Data Governance Policy, Digital Infrastructure Policy and etc. According to the plan's implementation schedule, the government wants to go paperless in 2026 and integration of AI technologies into public service systems and processes before 2027.
This plan indirectly calls for and creates a demand for technically skilled labour force in emerging fields like software engineering, data science, artificial intelligence, e-commerce and cybersecurity. Meeting this demand will challenge the universities in Papua New Guinea on two fronts. First is modernizing the universities themselves as institutions and integrate ICT technologies in their administration and core business of teaching and learning. This is highlighted in the Department of Higher Education, Research, Science and Technology (DHERST)'s policy document titled " Policy on Digitalization of PNG Universities Research Institutes. Secondly is to realign and modernise their ICT course curricula to meet these digital demands in the workforce.

Therefore, this paper seeks to establish the current status of ICT related courses or programs offered across seven universities in the country by analysing the DHERST first year university student selection list for 2025 academic year from the National Online Application System (NOAS), the system that selects students and awards government scholarships to students. Each subject units for each course will be analysed to determine whether these ICT Courses are reflective of the current trends in ICT and the emerging fields like Artificial Intelligence, Cyber Security, E-commerce and etc.
The results will generate informed awareness of the shortfall in ICT courses curriculum reform across all universities and higher learning institutions and help formulate corrective action plans rather than waiting for the current course preview period which is every 5 years. This will ensure the ICT graduates are job ready when they enter the job market.

Keywords: PNG Government Digital Plan, ICT Curriculum Reform

*Speaker

An Analytical study of Traffic Congestion in Honiara

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Efficient transportation system is one fundamental key to the economic drive of a nation. Winston (2013) states an efficient and extensive transportation system greatly enriches the standard of living in modern societies. Why certain roads can handle large volumes of traffic smoothly is astounding and the answer lie in traffic flow theories. The theories provide mathematicians to understand how vehicles move through transportation networks. In this paper we have studied the traffic jam at Mataniko in Honiara. The method used is quantitative method where chi square test is used to find the relationship between the speed of vehicles during congested hours and at night when there is no traffic congestion. Three different sites were selected and analysis. Site A (SINU gate, Kukum) and site B (China Town) were located before the congestion region and site C (New Generation) is located after the congestion region. The quantities collected were the flow of traffic, density and speed of vehicle at various time intervals. The data obtained is analyzed using Microsoft excel and python software. The study revealed that traffic jam occurred at 8:30 am. The results obtained at Site A chi square = 6467 with p-value =1.7E-132, at site B the Chi Square =346.8 and p-value = 1.8E-68 and site C chi square =7.1 with p-value = 0.71. Based on the above results there is a significant difference between the speeds of vehicles in site A and B. The chi square with p-values < 0.05 shows the high density of vehicles in sites A and B compared with the density in site C. Using vital information in this research responsible authority can make policies to help mitigate traffic jam problems in the future.

Keywords: Traffic jam, traffic congestion, chi square test, traffic modeling

*Speaker

An Assessment of PNG Government's Connect PNG Program: A Socioeconomic Survey of the Baiyer-Madang Road.

Starza Paul * [1]

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This research examines the impact of infrastructure development on rural communities in Papua New Guinea (PNG), with a particular focus on the Connect PNG Program and the socioeconomic effects of the Baiyer-Madang Road. The study explores how connecting rural communities to urban centers can unlock their economic potential, improve living standards, and enhance access to goods and services. The objective of this research is to assess the role of infrastructure in fostering economic activities, reducing isolation, and empowering rural populations. By identifying gaps in current infrastructure and its socioeconomic impact, the study aims to provide insights into how infrastructure development can drive sustainable rural growth. A baseline study methodology was employed to collect data from affected areas, providing a complete understanding of the existing conditions. This approach helps establish reference points for measuring progress and evaluating the long-term impact of infrastructure projects. The baseline data will serve as a benchmark for assessing improvements throughout the project cycle. The findings indicate that lack of infrastructure limits rural communities from accessing economic opportunities, natural resource markets, and essential services. Improved connectivity through well-planned infrastructure development can significantly enhance socioeconomic conditions, economic participation, and overall quality of life.

Keywords: connect PNG program, baseline study, rural communities, socioeconomic impacts, infrastructure development.

*Speaker

An Evaluation of The Sustainable Practices Used By The Hotels & Resorts In Fiji And How These Practices Influence Guests' Behaviour (Satisfaction, WOM & Return Intentions)

Vikas Gupta * [1], Sunil Sinha *

[2]

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Purpose- This study purposes to identify and explore the various sustainable practices used by the hotels and resorts in Fiji. It will also evaluate how these sustainable practices used in Fiji's hotels and resorts impact guests' behavior (satisfaction, Word-Of-Mouth, and intention to return) from different nationalities.
Design/Methods/Approach- It utilized dual-phase mixed methods framework, integrating qualitative and quantitative methodologies. In phase 1, we conducted 34 in-depth, semi-structured interviews with stakeholders which assisted in revealing the novel and creative sustainable initiatives these hotels in Fiji are offering to their guests. The hotels in this study were chosen based on their listing on the Etic Hotels website. The interviews were recorded, transcribed, and then analyzed using Atlas TI. Version 9.1.2 and Schmidt's coding handbook. For the 2nd Phase, a semi-structured questionnaire tool is formulated based on themes that emerged from in-depth interviews and review of extant literature. Using Convenience sampling, we collected data from 228 foreign tourists to evaluate their satisfaction levels using a seven-point Likert scale to gauge the significance of these green attributes in influencing the guests' satisfaction, Positive WOM intention, and their intention to revisit.
Findings- Our qualitative results revealed that resorts are adopting a wide variety of sustainable approaches, with "community development and involvement" standing out as a unique feature. Results revealed that hotels and resorts are implementing eco-friendly practices including solar power systems, bamboo-made linens, water-saving fittings, and rooftop gardens. Initiatives for waste elimination and recycling reduction, like composting, substance reuse, and promoting the reuse of linen, are also commonly implemented. Our quantitative results revealed that majority of tourists visiting resorts and hotels in Fiji were from Oceania region. Green practices were found to have a significant impact on 23.6% of the return intention and 29.8% of the satisfaction with guests, according to our regression analysis. Features like eco-friendly materials, refilling dispensers, local suppliers, and energy-efficient lighting significantly increased the satisfaction of the hotel guests, while recycling had the opposite effect. Furthermore, there were substantial disparities in how guests from other nations experienced and appreciated environmentally friendly initiatives, indicating that the impact of green practices differed by nationality.

*Speaker

Keywords: Sustainable practices, Hotels, Fiji Islands, Mixed methods, Satisfaction

An Innovative Kalman Filter Based Beam-Steering Antenna Configuration for Maximum Power Transfer

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Wireless power transfer (WPT) technology has become a challenging and popular subject for research and application in many disciplines, including electric vehicles, consumer electronics, biomedical systems (e.g. implants that may be charged using RF power to avoid battery replacement), batteryless autonomous wireless sensor nodes in IoT and RFID. Although much of the research activity has focused on coupled systems such as capacitive and inductive WPT, more recently attention has also given to uncoupled WPT using RF signals and lasers. This paper addresses the challenge of maximum power transfer in WPT using RF signals in developing a transmitter and receiver multiple input multiple out (MIMO) system that is designed to act like beams that are narrow and touch at the tips like two dynamically connected beam tips to ensure maximum power transfer. Smart Beramforming Antennas are important for maximum power transfer for magnetic and electric power. This paper presents a nonlinear configurations of dipole arrays for forming a single beam in any desired direction to maximise the power transfer. We propose an eight-elements array structures to perform this single beam-steering functionality. Since antennas are bidirectional elements, beamforming in one direction means that the antenna will also have high receiving gain in that direction. Phase delay factors are optimized at the transmitter and receiver to form a single beam and then to steer the transmitter and receiver beams towards each other by optimization using a Kalman filter based algorithm. Phase shifters are added in the transmitter and receiver to obtain maximum directional gain. This configuration along with Kalman filter based algorithm significantly increases the power transfer gain with operational simplicity.

Keywords: wireless power transfer, adaptive antenna, smart beam steering

*Speaker

An analysis of Cultural Intelligence in Different Regions of Papua New Guinea based on Physics Education

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Cultural intelligence is important in a globalized world where people from different cultures interact effectively. The cultural factors that influence education in Papua New Guinea are language barriers, traditional knowledge in science, the teaching methods, students' attitude towards science and the societal or family expectations. In our study, we selected physics education because physics is the study of matter and energy which is closely associated with the environment and supports all branches of science, engineering and technology. Cultural quotient has been calculated in different regions of PNG by conducting a survey on first year university physics students from different regions of PNG. Cultural quotient was found to be higher in Highland region and lower in Island region. Remedial methods have been suggested to improve the cultural quotient in all regions of PNG.

Keywords: Papua New Guinea, Physics Education, Cultural Intelligence, Language

*Speaker

An analysis of genetic variation among Galip nut (Canarium indicum) accessions from four Islands of Papua New Guinea

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Galip nut (*Canarium indicum* L.) is an agroforestry species grown for its edible nuts and lumber. It belongs to the Burseraceae plant family, which consist of 16 genera and approximately 100 species of which 21 are found in Papua New Guinea (PNG). It has been cultivated in Melanesia (PNG, Solomon Islands and Vanuatu) for thousands of years. Galip nut has cultural significance among coastal communities of PNG, which evidences of fossils found in the caves in the Arawe Islands of West New Britain Province and fields of Ramu in Madang Province dating back to more than 6,000 years ago. It has been an important source of oil, protein, vitamins and minerals and medicinal uses even dried and preserved for periods of long dry spells. Galip nuts have a mild, delicate flavour similar to that of macadamia (*Macadamia integrifolia*) or almond (*Prunus dulcis*). There are only five nuts that are dominating 90% of the world nut market and galip nut has a great potential to be developed into an export crop for PNG. However, the extent of variation is not well understaood, and variations in sex determination within a population (male trees with little or no fruits at all, female trees have erratic production and depend on availability of males) is a major constraint to production. The present study is a first attempt to assess the extent of morphological variation among existing germplasm in PNG, and identify potential lines for commercial production. **Keyword:**

Keywords: Galip nut, Canarium indicum, genetic diversity, characterization, descriptor list

*Speaker

An assessment of heavy metals contamination in freshwater sediments and fish and cyanide in sediment around Gold Ridge mine site, Solomon Islands

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Heavy metals in riverine sediments around Gold Ridge mine site ranged from 0.71 ± 0.09 to 726.73 ± 0.86 μg g–1. Out of all the metals that were investigated in the area, only arsenic metal claimed the highest concentrations for all sites within the area with values exceeding those of the WHO and EPA guidelines. The moderate type of contamination was shown for cyanide in sediments with values of 0 to 4.41 ± 0.35 μg g–1 which exceeded the WHO limit of 1μg g-1. The values of metals recorded for the two selected fish species Gobiidae, Belobranchus belobranchus and Rhyacichthys aspro ranged from under 0 to 2.59 ± 0.38 μg g–1. The used of these fish species, as bio-indicator of heavy metal contamination in rivers around Gold ridge proved them suitable to use as bio-indicators for future studies in the area. The sequential extraction of heavy metal in sediments indicated that most metals were present in the non-resistance fraction, a fraction that was readily available to move in the environment. Comparing the present study to the baseline study in the same area, indicated a simple % ration of, Cu (17%), Pb (78%), and Cr (54%), Cd (no data) and As (55%) was noted for all metals in the sediments. The present study confirms a significant increase of metals over years in rivers around the Gold Ridge mine site. The highest levels of metals and cyanide in riverine sediment around Gold ridge mine site, compared to other Pacific studies, are definitely attributed to the discharge of waste water from the tailing dam in the area.

Keywords: Pollution, heavy metals, cyanide, sediments, sequential extraction, Gold Ridge mine

*Speaker

An assessment of heavy metals contamination in marine sediments and fish in Honiara Harbor, Solomon Islands

Dickson Boboria * [1]

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Heavy metal contaminations were investigated in sediment and three selected marine fish species (parrot, snapper and trevally), in Honiara, Solomon Islands. The heavy metal levels in Honiara sediments and fish ranged from 3.89 ± 0.05– 14,055.81 ± 1.74μg/g in sediment and nd - 13.58 ± 0.09 μg/g in fish. The increased levels of all metals in sediments in the present study indicated that the Honiara Harbor is very contaminated with the investigated metals which can pose an ecological threat in the harbour. This study shows comparable or higher values of heavy metal pollution as recorded by sediments in other Pacific and developed countries. The sequential extraction of heavy metals in sediments indicated that most metals were present in the non-resistance fraction. Comparing the levels of metals in some fish species caught in Honiara Harbor with some Pacific and developed countries data shows reasonably higher or comparable values for Cu, Pb and Cr in the tissues. Likewise comparing the levels of heavy metals in fish tissues with the EU and WHO standard guidelines indicated that the levels of Cd, Pb, Cr and As in this study showed higher levels in the fish tissues above EU and WHO standard guidelines. The highest levels of metals in sediment and fish in Honiara Harbor, when compared to other Pacific studies, are attributed to the discharge of raw sewage around the city, hospital wastes, industrial activities and dumpsites around the harbour.

Keywords: Honiara harbor, heavy metals, sediments and fish, speciation

*Speaker

An investigation into the current infrastructure capacity of remote Jimi Secondary School in Jiwaka Province, Papua New Guinea and its impact on grade 12 students' enrolment.

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The study aims to examine the current infrastructure capacities of this school since its' inception and with the introduction of the Tuition Fee Free (TFF) Policy by the Papua New Guineas' government in 2012 implication towards quality education.
Incapacity in infrastructures affected the student's enrolments specifically the grade 12 student's population decreasing significantly in 2024.The study further identifies other contributing factors.

The methodology of the study was a mixed method consisting of both qualitative and quantative approaches. Interviews and observations with non-random convenience sampling was used to collect information from different stakeholders of the school with provincial educational authorities using straightforward methods in presenting data.
The research showed that 90% of the initial infrastructure capacity being the same and with the TFF policy funding was not adequate to build new and maintain much-needed infrastructures. Other factors such as deteriorating road conditions had been a major inference to the school's operations over the years, management concentrated more on the operations and their existences than infrastructures capacities developments. Recently the road conditions have improved dramatically, however, the school recently changed status to secondary school which now requires more specific infrastructures capacity which is insufficient to carter for current demand for quality education resulted in very low students' enrolment into Grade 12. Few of the other funding's projects and the school's initiatives in infrastructures capacities developments using the TFF policy funding, were yet to reach completion that would probably change the status quo improving quality education in the school.

Keywords: School Infrastructures, Students enrolment, Tution Fee Free(TFF) Policy

*Speaker

Application of traditional knowledge and skills for social conflict resolution between organizations and landowners: lessons from a female's experience in the oil palm industry.

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1

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Social conflicts in organizations can be challenging for females to manage where women are perceived as having lower status than men. The aim of this paper is to present reflections on significant challenges women extension leaders in leading organizations experience, and promising socio-cultural strategies that can be utilized to contain these challenges. While standard operational procedures exist in companies, dealing with socio-cultural issues with landowner groups or nearby settlers can be challenging, especially when the issues of concern have repercussions on the company's operations. It is at this juncture where the company's extension leaders have to draw from the traditionally accepted practices to ease the situation. As a female extension leader and the manageress of estates this is not easy. The paper draws from the experiences of a leading female extension officer who served the New Britain Palm Oil Company for more than a decade beginning from a junior officer to estate manageress managing five Oil Palm estates. In the paper reflections on various social issues are presented. Successful strategies that were employed to contain each issue are also discussed. It is hoped that the reflections would provide encouragement to women leaders in the Pacific who find themselves in similar situations. The paper concludes by underscoring the relevance of traditional skills and knowledge in managing socio-cultural conflicts in organizations.

Keywords: Traditional knowledge, social conflicts, New Britain Palm Oil, female extension leaders

*Speaker

Assessing the Downstream Impacts of Soil Sedimentation Caused by Small-Scale Alluvial Mining in Atamo, Central Bougainville

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1

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The sedimentation of soils resulting from small-scale alluvial gold mining poses major environmental
and socio-economic problems for the communities concerned. This study examines the extent and
consequences of soil erosion caused by mountain gold mining in the Atamo area of Central
Bougainville, Papua New Guinea. Using qualitative methods, including field surveys, interviews with
local communities, the study documents sediment accumulation in river basins, which has disrupted
natural water flows, damaged infrastructure, and altered aquatic ecosystems. The issue is further
exacerbated by the presence of climate change, where irregular and extreme rainfall events accelerate
soil erosion and sediment transport from mining sites into waterways. Key findings show that sediment
deposition has resulted in the diversion of rivers, road deterioration, and a deterioration of water quality
for human consumption. The study also highlights the lack of awareness among miners about sediment
management and the absence of formal mitigation strategies. The report concludes that soil
sedimentation is a threat to environmental sustainability and hinders the livelihood and mobility of the
communities concerned. The document recommends the introduction of effective erosion control
measures, reforestation, and regulatory frameworks to manage mining practices and protect the
ecosystems downstream.

*Speaker

Keywords: Soil sedimentation, alluvial mining, environmental degradation, water flow disruption, Atamo, Bougainville, small, scale mining, river ecosystems

Assessing the Readiness in ICT Integration in faith-based Secondary Schools in Port Moresby, Papua New Guinea.

Hilda Tuka-Nennek * [1], Kepha Pondi [1]

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Introduction- The ICT integration in teaching and learning is an enhancer in education. The use of ICT software, hardware and internet has improved teaching and learning. Although many studies on ICT integration have been conducted in various parts of the world, there is limited study in PNG including the region. This study employed Technological, Pedagogical and Content Knowledge (TPACK) to explore readiness in ICT Integration in teaching and learning in faith -based secondary schools in Port Moresby.
Methodology-Qualitative multiple case studies were employed in two secondary schools. Twelve in-depth interviews were conducted on students, teachers, and administrators, and five focus groups of six participants in each selected school. Thematic analysis was performed using HyperResearch software.

Findings-The findings revealed that ICT hardware and software were used in teaching and learning, however the extent of use depended on limited knowledge and skills, infrastructure, leadership, and expected outcome. Preparation for integration of ICT in teaching and learning requires review of ICT curriculum, infrastructure and leadership.
Recommendation- Secondary schools should develop ICT infrastructure to support ICT integration and encourage capacity building for teachers. Future studies on readiness in ICT integration should be performed in other secondary schools in Papua New Guinea.

Keywords: ICT integration, Teaching and Learning, Readiness, Secondary School, Papua New Guinea.

*Speaker

Assessing the Water Balance and Groundwater Drying Trends in Papua New Guinea: The Potential of Soil and Water Conservation for Recharge Restoration

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Papua New Guinea (PNG) is experiencing rising groundwater stress, endangering rural and peri-urban livelihoods that rely on shallow aquifers. This work undertakes a quantitative water balance assessment across important PNG regions, using climatological and hydrological data (rainfall, evapotranspiration, surface runoff, and groundwater extraction) to identify the imbalance between recharge and outflow that drives observed drying trends. Preliminary investigations show large regional variations in water balance, with some places particularly vulnerable to groundwater depletion. Furthermore, the study assesses the effectiveness of soil and water conservation (SWC) methods such as contour farming, vegetative cover, recharge ponds, and check dams in mitigating this depletion. The study calculates the recharge potential of selected SWC interventions using literature-based infiltration enhancement ratios, area suitability mapping (taking slope, land use, and soil texture into account), and lessons from PNG agricultural operations. Initial results indicate that strategically adopted SWC practices, particularly in highland and deforested areas, can significantly improve groundwater recharge. The study concludes with practical recommendations for incorporating SWC into localized watershed and water resource management strategies, with the goal of promoting sustainable groundwater management and resilience throughout PNG.

Keywords: Groundwater Drying Trends, Papua New Guinea (PNG), Recharge Restoration, Soil and Water Balance, Water Conservation (SWC).

*Speaker

Assessment of Soil Carbon and Nitrogen Stocks and Spatial-Environmental Drivers in Rewa Delta Mangroves, Fiji

Arti Reddy * [1], Jeff Baldock *

[2]

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Mangrove ecosystems rank among the most productive environments globally, providing essential ecosystem services that sustain biodiversity, support livelihoods, and contribute to climate change mitigation. In the Pacific Islands, particularly Fiji, mangroves play a critical role in ecological and community resilience. The Rewa Delta contains extensive mangrove forests with significant potential for carbon and nitrogen storage; however, these stocks are increasingly threatened by anthropogenic pressures. Despite recognition as a vital blue carbon ecosystem, data on soil carbon and nitrogen stocks, as well as the spatial and environmental factors influencing them, remain limited. This study quantified soil carbon and nitrogen stocks in the Rewa Delta and examined their spatial distribution and controlling environmental variables.
A total of 120 soil cores were collected across two contrasting sites, alongside in situ measurements of soil and vegetation properties. Subsequently, 1200 subsamples were analyzed using infrared spectroscopy and LECO elemental analysis. Principal component analysis (PCA) and partial least squares regression (PLSR) models were developed to predict carbon and nitrogen concentrations, achieving high predictive accuracy ($R^2 \geq 0.80$). Stocks were estimated for two depth intervals: 0–30 cm and 0–100 cm. Mean stocks were 168.8 Mg C ha^1 and 6.7 Mg N ha^1 at 0–30 cm, and 473.8 Mg C ha^1 and 19.1 Mg N ha^1 at 0–100 cm. Spatial variability was evident, with higher stocks recorded in landward areas. Tree biomass, salinity, temperature, and soil pH were identified as significant environmental drivers influencing stock distribution.

The findings confirm the high carbon and nitrogen sequestration potential of the Rewa Delta mangroves and emphasize the influence of spatial and environmental factors on stock variability. The demonstrated accuracy of infrared spectroscopy for stock quantification provides a robust tool for future blue carbon assessments. These results contribute to enhancing blue carbon inventories and underscore the need for targeted conservation strategies to support climate change mitigation efforts in Pacific Island ecosystems.

Keywords: Blue Carbon, Carbon sequestration, Infrared spectroscopy, Mangrove

*Speaker

Beta-carotene Concentrations of Seven Varieties of Pandanus Conoideus Oil in Lufa District, Eastern Highlands and Jimi District, Jiwaka Provinces of Papua New Guinea

Matthew Pok * [1], Ronald Aknonero [2], Baro Gise [1]

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[2] Innovative University of Enga – Papua New Guinea

This work documents the ethnological classification, ethno-taxonomic nomenclature and the chemical profile of the different varieties of *Pandanus conoideus* of Kauil village, Jimi district, Jiwaka Province and in Mt Micheal, Lufa District in the Eastern Highlands Province of Papua New Guinea. The *P. conoideus* is referred to as '*marita*' in PNG lingua franca pidgin and kombo in Yuu-Naa dialect of Jimi. Selected elderly individuals from the study area (Kauil) in Jimi and Lufa were interviewed using unstructured and open-ended questions to obtain the ethnological and local taxonomic data/information on the different varieties of *marita*. Based on traditional classifications systems, sixteen (16) varieties were identified in Jimi and six of the sixteen *marita* fruiting body including a separate special variety excluding its ethnological classification in Mt Micheal range, Lufa were collected and analyzed in this study. The collected *marita* samples were analyzed for beta carotene concentrations. For samples extracted in ethanol, the sample were diluted 1:20 with diluent and 2μL sample were injected into the HPLC system. For samples extracted in hexane approximately 30 mg oil were solved in 1mL diluent and thereafter diluted 1:20, and 6μL were sample injected to the HPLC. Diluent was MeOH and Dichloromethane in ration 1:3. HPLC analysis was performed by an Agilent 1260 liquid chromatography system (Agilent Technologies, Palo Alta, CA, USA) with UV detector with 60mm cell. The carotenes were separated on a YMC C30 Carotenoid 150mm x 4.6mm column with particle size 3.0μm. A detailed Excel table for the samples were obtained and discussed in this study. The results of the study of beta –carotene concentration (mg/g) from the highest to the lowest with respect to the solvent extraction of hexane and ethanol respectively are: Truva (7.9), Pengip (6.2), Dowei (5.1), Nomung (4.7), Alla (3.9), Kulang (0.5), Andamung (0.1) and Truva (3.2), Alla (2.1), Nomung (1.7), Pengip (0.9), Dowei (0.5), Kulang (0.5), Andamung (0.1). These concentrations are higher than other marita beta-carotene data reported in other studies which proves PNG marita has higher concentrations of beta-carotene which needs further exploitation.

Keywords: Ethnotaxonomy, Indigenous food crop, Pandanus conoideus, beta, carotene, HPLC, Papua New Guinea.

*Speaker

Between frustrations and opportunities: Experiences of Undergraduate Students in Writing Research proposals in a Tertiary Institution in Papua New Guinea.

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This study explored the experiences of undergraduate students in writing a research proposal in Papua New Guinea (PNG). Research Proposal writing is a prerequisite in many tertiary institutions worldwide before conducting a research project. Much research conducted in this area has focused on challenges students face in writing research proposals. However, limited information is available on the students' experiences, including opportunities and challenges. Thus, this study explored the experiences of undergraduate students in writing a research proposal to address this gap.

A qualitative transcendental phenomenological approach ensured that everyday perceptions of proposal writing were set aside to delve deeply into the experiences of undergraduate students who have just completed writing a research proposal. The study involved twelve (12) undergraduate students from various disciplines of a tertiary institution in PNG. A phenomenological interview was conducted to gather the participants' experiences.

The study revealed that participants' experiences were more personal, indicating both frustrations and empowerment. Participants consistently described challenges and frustrations, such as 'lack of (English) vocabulary leading to repetition of words, synthesizing literature, it's like so much information, I didn't know how to put them together', unfamiliar context- 'it was tough for me...It was not something I expected..., because it was new to me... I had to adjust myself enough to write the research proposal'. This further indicates that students' context is crucial in their experiences in writing a research proposal.

On the other hand, participants expressed empowerment, such as the topic of their project; 'I was so excited about the topic because ...it was on my major'; 'I found that interesting because the topic was like my experience', 'the topic was my business idea', previous exposure to research knowledge or future benefits of research. This indicates that the potential of research and its influence is an empowerment experience for the undergraduate novice researchers.

These findings suggest a need for contextualized and socially sensitive approaches in teaching research at the undergraduate level in PNG higher learning institutions, as the potential of research can be an empowerment approach for novice researchers.

Keywords: Research Proposal Writing, Undergraduate Students, Contextual Challenges, Academic Writing Challenges, Research Opportunities

*Speaker

Biofortification of staple crops in Papua New Guinea towards a sustainable future ensuring food and nutrient security

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Micronutrient deficiencies such as iron, zinc and vitamin A are the cause of a majority of the health burden in the world. Hidden hunger affects more than two billion people mostly in low- and middle-income countries. Undernutrition remains a significant cause of childhood illness, poor growth, development, and death in Papua New Guinea (PNG). The prevalence of child undernutrition varied from 1% to 76% for wasting (median 11%), 5% to 92% for stunting (median 51%), and 14% to 59% for underweight (median 32%) in 2018. Yet, PNG is one the few countries in the world enriched with biodiversity. Together with the main island of New Guinea, it accounts for the 5% of global diversity of animal and plant species; two-thirds of which are endemic. A recent systematic review on the child nutritional status in PNG concluded that a lot of variability exists due to factors such as poverty, disease, food security, cultural, environmental and sociopolitical issues that require a complex set of solutions by governments, health systems and local communities. A fourth important factor identified by the FAO Small Islands Developing States (SIDS) forum in November 2024, was to find solutions for better food production, nutrition, health and life in the Pacific that would *weave* in nutrient-sensitive agriculture by bringing all three- agriculture, food and health sectors to work together. This presentation will show how this would work with research and development towards biofortifying crops such as sweet potatoes, cassava, corn and introducing other nutritious crops as a long-term solution for PNG. Further, the importance of collaboration in research and development through partnerships will be demonstrated with success stories on biofortification in other regions in the world.

Keywords: crops, nutrition, nutrient, sensitive agriculture, health, biofortification, iron, vitamin A

*Speaker

Biological screening of Xanthostermon and Myrtaceae essential oils from Oceania and of synthetic triketone analogues

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Essential oils are important renewable materials with a broad range of fragrant, medical, or healthcare properties. According to the UN – FAO, Northeastern Australia, and Melanesia offer rich resources of endemic plant species with potential medical applications. *Xanthostemon,* a genus of Myrtaceae has 55 species of which 44 are distributed between Papua New Guinea (4), Australia (14), Indonesia (3), and New Caledonia (23). 50% of *Xanthostemon* species in Australia are endemic, with many containing β-triketone derivatives. Several β-triketones are known for their insecticidal, herbicidal, and antimicrobial properties. For example, *X. chrysanthus* essential oil contains 64-84% of leptospermone and was active against *S. aureus* and *E. coli.* Likewise, acylated β-triketones are the main antimicrobial components of mānuka oil (*Leptospermum scoparium*) with 20-33%. Despite this, no structure-activity relationship study has been conducted on β-triketones to evaluate their antimicrobial potential. The chemical compositions of selected *Xanthostemon* essential oils from Oceania were thus determined and several natural β-triketones were successfully identified. In addition, **26** synthetic analogues were likewise prepared and subjected to antimicrobial and larvacidal - adulticidal *A. aegypti* screening. Several essential oils and synthetic derivatives showed immence bioactive potential against mosquito *A. aegypti* larvae and *S. epidermidis.*

Keywords: Renewable materials, Xanthostemone, β, triketones, bioactive

*Speaker

Biosorption of Chromium from Aqueous Solutions Using Garcinia cymosa f. pendula Leaf Powder: A Study on Equilibrium and Kinetics

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Pollution is rapidly increasing across many countries, with air and water pollution being the most prevalent types. Heavy metal contamination in wastewater poses a major global environmental threat. Heavy metals are defined as those with a relatively high density that are toxic even at low concentrations. Prolonged exposure to heavy metals through drinking water can severely impact human health. Chromium, a particularly harmful metal, is often released by industries such as alloy and paint manufacturing. While water-insoluble chromium is generally not harmful, hexavalent chromium presents significant health risks. Numerous studies have shown that elevated chromium levels in cells can cause DNA damage. Despite the availability of proven adsorbents, research continues to seek cost-effective alternatives. Dead plant material (biomass) is an abundant, inexpensive, and readily accessible biosorbent for removing dissolved metal ions from aqueous solutions. This study focuses on the equilibrium and kinetic behavior of removing heavy metal, specifically chromium ions, from aqueous solutions using *Garcinia cymose* sp. leaf powder as a biosorbent in a batch process, demonstrating effective removal.

Keywords: Biosorption, Garcinia cymosa f. pendula, Chromium, Batch Process, Equilibrium, Kinetics.

*Speaker

Bridging Generations: Ethnochemistry and Traditional Knowledge as Catalysts for Sustainable Scientific Innovation

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Ethnoscience, particularly through the lens of Ethnochemistry, plays a critical role in recognizing, validating, and integrating traditional knowledge into contemporary scientific discourse. For thousands of years, Indigenous communities have cultivated systems of knowledge by observing and interacting with their natural environments. These systems-rich in chemical insight, sustainable practices, and cultural significance-are passed down generationally and remain relevant in addressing current global challenges, particularly those related to sustainability and biodiversity. This paper explores how traditional knowledge not only supports sustainable living practices but also presents valuable insights into the scientific principles embedded within traditional rituals, medicine, and ecological management. Revisiting and engaging with local communities provide an opportunity to investigate, document, and analyse these traditional systems, drawing parallels with modern scientific methods. By treating science as a human endeavour with diverse contributions, we can foster respectful integration of Indigenous wisdom into scientific research. This approach can lead to the formulation of novel hypotheses, inspire innovative solutions, and promote inclusive scientific advancement. The presentation aims to highlight how ongoing collaboration between traditional knowledge holders and scientific communities can contribute to both cultural preservation and progressive scientific discovery.

Keywords: Ethnochemistry, Traditional Knowledge, Indigenous Science, Sustainable Practices, Scientific Integration

*Speaker

Bridging Traditional Knowledge and Food Safety Technologies: Pathways for Market Access of Papua New Guinea Frozen Taro

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[1] The Papua New Guinea University of Technology – Papua New Guinea

Taro (*Colocasia esculenta* (L.)) is a culturally significant crop in Papua New Guinea (PNG), across the Pacific Islands, and within various indigenous communities worldwide. This study explores how integration of traditional agricultural knowledge with modern food safety technologies can enhance market access for PNG frozen taro in selected international markets, including Australia, United States, Japan, New Zealand, Canada, United Kingdom, Netherlands, Germany, and the United Arab Emirates. Using a comparative mixed-methods approach, the research draws on semi-structured interviews, structured surveys, trade and customs data, and regulatory document analysis. Stakeholders, include taro farmers from Lae and West New Britain, exporters/processors in Lae, and a broad range of government and support institutions. Qualitative data and quantitative assessments of trade trends, compliance data, and institutional support were collected and analysed. Initial findings highlight that while exporters apply basic hygiene and good manufacturing practices, they lack awareness of formal food safety management systems such as Hazard Analysis & Critical Control Point (HACCP) despite the existence of subsidized certification programs. At the farm level, traditional low-input methods grounded in seasonal planting, organic pest control, and local ecological knowledge are widely practiced. In traditional Melanesian societies, this knowledge is primarily transmitted orally, presenting challenges when aligning with formal certification systems that demand documented processes. These challenges are compounded by low literacy levels in rural areas and financial barriers that restrict individual farmers from adopting good agricultural practice, organic certification, or HACCP on their own. The study found that cooperative societies offer a viable and culturally appropriate strategy to bridge the gap. Group certification models can support collective compliance, improve traceability, facilitate targeted training, and reduce per-capita certification costs. However, adoption of current technological applications in processing and export readiness, such as freezing methods, hygiene controls, and traceability mechanisms is limited, impeding compliance to international standards. Guided by Institutional Theory, the Resource-Based View, and Transaction Cost Economics, the research shows how adapting food safety systems to PNG's socio-cultural and economic realities can create inclusive pathways to export readiness. This interdisciplinary analysis supports the broader Pacific agenda of integrating traditional knowledge with appropriate technologies for sustainable development.

Keywords: Taro, Papua New Guinea, Traditional/Indigenous Knowledge, Food Safety, Market Access, GAP, HACCP, Organic Certification, Subsistence Farmers, Cooperative Societies, Traceability, Pacific Agriculture

*Speaker

Bridging the Digital Divide: A Comparative Study of Perceived Attributes of Student Engagement in Online Teaching and Learning in Two Universities in Papua New Guinea

Thamarai Dr. Thamarai Selvi * [1]

[1] University of Goroka – Papua New Guinea

As online education gains prominence, understanding student engagement in digital learning environments remains critical. It is an ongoing research. This study explores the perceived attributes of online teaching and learning effectiveness from the perspectives of students, lecturers, and instructional leaders at two universities in Papua New Guinea. Using a mixed-methods approach, the study integrates both quantitative and qualitative data to provide a comprehensive analysis.
Data collection will occur in two phases. Phase one involves a survey of 120 students (N=120), with 60 from each university, followed by qualitative interviews with a subset (10%) to deepen insights into their engagement experiences. Phase two consists of two stages: qualitative interviews with 20 lecturers (10 per university) to assess the strengths and weaknesses of online teaching and further interviews with six instructional leaders (three per university) to understand institutional support for digital education.

For data analysis, quantitative survey responses will be analyzed using descriptive and inferential statistical techniques, ensuring an objective evaluation of engagement factors. Qualitative data from interviews will be subjected to thematic analysis to identify key patterns and insights across student, lecturer, and institutional leader perspectives.
Findings will contribute to the discourse on online learning in developing contexts, highlighting challenges and opportunities. The study aims to inform policy and practice by offering solutions to enhance student engagement in online education across Papua New Guinea.

Keywords: digital divide, student engagement, on line learning

*Speaker

Building Information Modeling (BIM) Integration in Construction Projects: Reducing Delays Through Effective Communication and Collaboration

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Project time overruns or delays in completion beyond the planned schedule are a common issue in construction and project management that can have negative consequences including increased costs, lost revenue, and damage to a company's reputation. Effective communication and collaboration are crucial to decline time overruns on projects. By clearly articulating project goals, timelines, and specifications, all stakeholders can work toward a shared vision and minimize errors and delays. Establishing clear communication channels, such as regular meetings and updates, facilitates timely information sharing and decision-making. Digitizing the construction industry can foster real-time collaboration with a centralized approach, allowing all stakeholders to access and update project data, leading to improved coordination, reduced errors, and ultimately, better project outcomes. Building Information Modeling (BIM) significantly enhances communication and collaboration on construction projects by providing a centralized, digital platform for information sharing and project visualization. The aim of this paper is to investigate the critical role of effective communication and collaboration in reducing time overruns and determining further improvements through BIM as a digital process. This study focuses on previous prominent research in the field of effective communication and collaboration to identify key factors contributing to successful project outcomes, leading to the elimination of time overruns in construction projects, and examines how BIM serves as a powerful digital tool to improve these aspects.

Keywords: Time overruns and Delays, Effective Communication and Collaboration, Building Information Modeling (BIM)

*Speaker

CONTAMINATION OF DUMP SOILS BY TOXIC HEAVY METALS: AN EMERGING RISK TO GROUNDWATER QUALITY

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Abstract

Heavy metals such as lead (Pb), cadmium (Cd), and mercury (Hg) pose significant concerns due to their persistence in the environment and their potential risks to human health and ecosystems. Contamination of soil can jeopardize groundwater quality, as precipitation may facilitate the leaching of these metals into the water supply. Given that groundwater serves as a crucial source of drinking water, such contamination can adversely affect aquifer geochemistry, resulting in severe health and environmental consequences. This study corroborates earlier research that identified the presence of Cd, Pb, and Hg in borewell samples by assessing heavy metal concentrations in the soil surrounding the Papua New Guinea University of Technology's dump site. Utilizing Inductively Coupled Plasma Mass Spectroscopy (ICP-MS), the investigation revealed concentrations of Cd, Pb, and Hg ranging from 0.0031 to 0.0062 mg/L, 0.04 to 0.63 mg/L, and 0.0008 to 0.0018 mg/L, respectively. The findings indicate a significant increase in heavy metal concentrations in proximity to the dump site over the years.

Keywords: Key Words: Ground water, Open dump site (ODS), Heavy metal contaminants, Inverse distance weight (IDW) interpolation.

*Speaker

Centering Pacific culture in developing culturally tailored health programs and policies for Pacific Islander communities in Australia

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This methodologically innovative research project aims to develop culturally tailored health programs by assessing the diets and health status of Pacific Islanders in Australia and understand what current Australian programs and policies can be improved. This study strives to create long-term positive health impacts and reduce the prevalence of diet-related NCDs in Pacific communities. In this research Pacific Islanders are defined as individuals with cultural and ancestral ties to Melanesia, Micronesia, and Polynesia. While often described as 'statistically invisible,' the Pacific Islander population in Australia has grown substantially over the last 20 years. Although it is generally known that Pacific Islander communities face a higher burden of non-communicable diseases (NCDs), there are limited programs grounded in both Pacific health methodological approaches and western academia approaches. This presentation will show a unique example of how to bring together Pacific health methodology and western academia. This research applies the Fonofale model, which is a Pacific Islander tailored holistic health approach that uses the metaphor of a *fale (house)* to represent what needs to be considered when providing a culturally safe Pacific approach to health. The fale is grounded in the importance of family and encompasses the spiritual, mental, and physical Pacific health aspects that are interconnected to culture. The fale model also considers other health aspects such as time, environment, and context; all of which impact Pacific Islander overall wellbeing. The research brings together two approaches to Pacific Health, considering the health learnings from Pacific communities in the Pacific, New Zealand, and Australia as well as the different approaches and knowledge systems across community and academia, factoring in the importance of culture, holistic health, and wellbeing. In conclusion, it is important to consider applying Pacific centred health models such as the Fonofale model in Pacific health research, as these models acknowledge the multi-dimensional holistic approaches that could create long-term positive health impacts in Pacific Island communities.

Keywords: Diet, NCDs, Culturally tailored programs, Pacific, Health, Community

*Speaker

Challenges and pathways to facilitate the energy access transition in the Pacific

Edoardo Santagata * [1,2], Manu Rawali *

[3,2], Joshua Geller [1,2], Alvin Datt [4], Anna Bruce [1,2], Iain Macgill [1,2]

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Pacific Island Countries and Territories (PICTs) face significant challenges related to energy access. Many PICTs are heavily dependent on fossil fuel imports, and due to rugged terrain and vast maritime distances, numerous remote communities lack access to grid electricity. Limited access to energy constrains livelihood opportunities and access to essential services such as clean water, healthcare, and education, further exacerbating social and economic inequalities. While several PICTs have achieved near-complete energy access due to small populations or higher levels of development, three countries – Papua New Guinea, Vanuatu, and the Solomon Islands – continue to lag behind. This paper presents case studies from communities across these three countries and identifies pathways to better structure energy access projects, drawing on key technical challenges, local aspirations, and socio-cultural considerations. We explore how proven technologies – including solar energy systems, remote monitoring tools, and telecommunications – can be harnessed to improve project sustainability, while also emphasising the need to integrate traditional governance structures, land practices, and community decision-making to ensure local ownership and resilience. We also examine lessons from other regional initiatives, with particular attention to Fiji's Solar Home Systems program, to highlight successes and persistent gaps in program design and implementation. In addition, we critically assess common challenges faced by donor-funded initiatives, including issues related to long-term maintenance, community ownership, and financial sustainability. Finally, we identify five key requirements for creating an enabling environment that supports the continued operational success of off-grid projects: (1) meaningful community consultation and ongoing training, (2) robust telecommunications and performance monitoring systems, (3) contingency planning and availability of spare equipment, (4) coupling energy access with local economic productivity opportunities, and (5) contextually appropriate financial management models. These findings aim to inform future energy access efforts in the Pacific by integrating technical, social, and economic dimensions to ensure lasting and equitable outcomes.

Keywords: Energy Access, Energy Transition, Renewable Energy, Solar Home Systems, Off Grid

*Speaker

Challenges in Artificial Intelligence Development in Higher Education in Pacific Islands: A literature review from a Papua New Guinea Perspective.

Jerome Oko * [1]

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Artificial intelligence (AI) refers to the development of computer systems capable of performing tasks that usually require human intelligence, ranging from simple rule-based activities to complex problem-solving and learning (AI Asia Pacific Institute, 2024). This research explores the challenges of developing AI at Higher Education in Pacific Island nations for training of the education students. A literature review is employed in this study about the readiness of AI in higher education, particularly in Papua New Guinea. The research findings indicate variations in the main challenges in developing AI to improve the quality of teacher education in the country. In the Pacific, infrastructure and internet access are the main constraints limiting the application of AI technology. Another finding was that the concern relates to the lack of human resources skilled in the field of AI, prompting the need for relevant skills development among educators. Furthermore, this study also identifies that utilization of advanced AI technologies, safeguarding privacy, and developing the capacity to accommodate rapid advances in technology-based education as three key areas to focus for teacher education in the Pacific Island Nations, especially in Papua New Guinea. The findings of this research provide valuable strategic insights, enabling the design of appropriate strategies in Pacific Islands nations like Papua New Guinea. The implications of the findings can assist the relevant parties in overcoming specific barriers in the context of Papua New Guinea, supporting innovative developments in technology-based teacher education.

Keywords: Artificial intelligence, developing, technology, internet access, pacific islands, safeguarding privacy

*Speaker

Challenging traditional airline business models to ensure the sustainable development of airlines in the Pacific.

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Aviation is often described as the lifeblood of island nations. Air travel permits the fast and efficient movement of people and goods. They also aid in accessibility, permitting movement beyond traditional non-powered modes of transport. During emergencies, air travel has repeatedly been shown to be the most efficient means of transportation. Airlines are, however, a complex business requiring expansive resources and infrastructure. Airlines are also heavily regulated to ensure operational safety. They are capital intensive, and in the competitive market of air travel, often struggle to remain financially viable, as they lack the scale to do so. Despite these challenges, airlines are often seen as the pride of a nation, leading those without a national airline/carrier, striving to create one. Conversely for nations with a national carrier, they are often looking for more financially viable methods of operating, or alternate models of financial sustainability. The presentation will explore the relevance of the traditional airline business model and present some innovative ideas around a more 'fit-for-purpose' model that better serves Island nations of the Pacific, yet still meets the need for a safe and sustainable airline model.

Keywords: Aviation: sustainability: safety: accessibility: air travel, airlines.

*Speaker

Chemical and Biological Investigation of the PNG Xanthostem species of the MYRTACEAE family

Stephanie Anis * [1], David Timi [2], Nicolas Lebouvier [3], Macquin Maino [1], Billy Bau [1], Jayson Wau [1], Michael Oelgemoeller [1,4]

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The isolation, identification of chemical constituents and bioactivity of the volatile oil of three species of *Xanthostemon* (Myrtaceae) in PNG will be presented. This research is part of the Pacific Islands Universities Research Network (PIURN). In this study, leaves of three *Xanthostemon* out of four species occurring in PNG were chemically and biologically investigated. These included *X. petiolatus, X. crenulatus,* and *Xanthostemon sp.* (formally known as *X. kasikasi*). The phytochemicals identified were mainly β-triketones & terpenes. From the volatile oil of *X. petiolatus*, three β-triketones including flavesone, isoleptospermone and leptospermone were identified and three terpenes including cyclocolorenone, viridiflorol and palustrol were identified. *X. crenulatus* volatile oil contained two β-triketones including flavesone and isoleptospermone and majority of the constituents were terpenes including caryophyllene oxide, spathulenol, β-bisabolene, humulene epoxide, ar-curcumene, caryophylla-3,8(13)-dien-5alpha-ol, nerolidiol E, β-farnesene E, caryophylla-4(12),8(13)-dien-5alpha-ol, β-bisabolol, ar-curcumen-15-al, patchoulene and farnesol (2Z,6Z). From *Xanthostemon* sp., four β-triketones were found including leptospermone, isoleptospermone, flavesone & papuanone and five terpenes namely β-selinene, trans-nerolidol, selina-6-en-4-ol, alpha-selinene and viridiflorol were detected. The hydro-distillation technique was employed to isolate the volatile oils and the technique of gas chromatography was used to determine the constituent biomolecules. The anti-microbiological property of the oils was assessed via disc diffusion or agar overlay technique against some pathogenic bacteria and fungi. The results indicated promising anti-microbial activities from all three species against four bacteria (2 G+ and 2 G-), a protozoa and four fungi. The nematicidal and termiticidal activity of the oil was assessed against the eggs of *Meloidogyne incognita* and *Coptotermes formosanus* (termites) respectively which also showed positive results. The diabetic property of the oils was also assessed with no positive results. Laboratory assays were carried out to test the hatchability of the eggs of *M. incognita*, susceptibility of *Coptotermes formosanus* and inhibition activity of *alpha*-amylase and *alpha*-glucosidase.

Keywords: Xanthostemon, Leaves, Volatile oil, β, triketones, Terpenes, Anti, microbial, Nematicidal, Termiticidal, Diabetic property

*Speaker

Church as a literacy hub: Investigating the functional literacy level of Rural Households in Papua New Guinea.

Alice Napasu * [1], Leeroy Elisha [1], Pakop Sovo [1], Rufina Katovai *

[1], Judy Elisha *

[1], Asipeli Kauyaca [1], Laisa Paul [1]

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This study focused on identifying the functional English literacy of Seventh-day Adventist members in Papua New Guinea. Functional literacy is the application of reading and writing skills in an individual's daily activities. PNG's multilingual nation and high illiteracy pose a significant challenge in investigating functional literacy. English is not a first language, as many, particularly those in rural areas, may grow up learning their local languages (can be more than two) and Tok Pisin. Many are introduced to English as they begin their education. To identify the level of Functional English literacy, the study further incorporated Tok Pisin, as Tok Pisin is considered a literary language in PNG.

This study employed a household survey in Adventist communities throughout PNG. A total of 574 households participated in the survey, with over 3000 respondents, including representatives from all four regions of PNG. Ethical approval was received from Pacific Adventist University, and permission was granted from provincial church administrators and local church pastors.

The study identified that functional English and Tok Pisin literacy are mostly used in religious activities and documents such as Bibles, hymns, and other religious documents. The study also discovered that there is less application of English and Tok Pisin literacy in professional documents such as books, newspapers, receipts, and others. The study further concluded that with the realities of life in PNG households, many lack the time to read. This study concluded that many people in PNG apply functional literacy in both Tok Pisin and English in practices that seem beneficial and significant for themselves, such as religious activities; however, significant non-literacy gaps were further identified. This study recommended that churches in PNG can be a literacy hub, thereby improving functional literacy and addressing illiteracy in PNG.

Keywords: Functional Literacy, Functional English Literacy, Functional Tok Pisin literacy, Adventist Church, Rural PNG Households

*Speaker

Climate resilient livestock production in Pacific Island Countries; Case study of Fiji Islands

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Globally, climate change is affecting livestock production. In the south Pacific, this is manifested by changes in temperature, rainfall, an increase in the frequency of severe storms, heat waves among many other indicators which negatively impact the livestock production systems. The resilience of livestock production system includes both low greenhouse gas emitting practices and the capacity to adapt to the changing climate to retain the health and productivity of the livestock systems. The objective of this study was to understand the impacts and the existing adaptation measures adopted by livestock farmers to mitigate against the negative effects of climate change and build the resilience of the livestock sector in Fiji as a prototype to other Pacific Island Countries. This study was conducted in three livestock producing provinces of Fiji. Here we interviewed different livestock farmers and key informants to find out how the livestock sector has been affected by climate change and the resilient of the sector. The results show that the livestock sector is vulnerable to social-economic, cultural and exacerbated by the changing climate and little or no adaptation measures have been taken over the years. Most farmers depend on government subsidies with little or no investment to the modern livestock farming practices, especially in the daily and beef farming. However, for the poultry farmers who are majorly contracted farmers by huge commercial poultry enterprises, receives training and support to improve their production systems and as result they are more resilient to the changing climate. Our analysis suggests the need for shift whereby modern livestock farming is adapted at local level and led by farmers with the support of government and co-operatives as the facilitators to enhance utilization of available resources, especially land to improve the livestock productions in Fiji.

Keywords: Climate change, Livestock, Resilient, Livestock adaptation

*Speaker

Combined Clean Energy Production

Alan Muirhead * [1], Wilfred Amai *

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3

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The author (Alan Muirhead) is the MD of **Clean Renewable Energy Designs Limited** (CRED), a PNG Company No. 1-112148, which is in a formal agreement with **UNSW**'s **Digital Grid Futures Institute** (ABN 57 195 873 179) 'DGFI'. The Collaboration is predicated on combining Hydro, Wind and Solar 'Off-Grid' electricity generation in remote regions to power water harvesting and hydroponics a closed system that cultivates subsistence and marketable produce and develops **Carbon Credits** and **Carbon Offsets** of measurable and *ipso facto* tangible value and negates deforestation.
Using the title '**Combined Clean Energy Production**' (CCEP), the system was developed when I was a Project Manager for a DFAT Contractor working on the Schoolrooms and Teacher's Housing across PNG and Bougainville in 2013 and noted that, especially in the Western Province that the rivers (Ok Tedi) were drought affected and windy days were rare and cloud cover was fairly common consequently to negate same CCEP was born.

The **UNSW Institute of Global Development** and **Papua New Guinea University of Technology** ('UniTech') are in a corporation alliance predicted on information sharing and the development of 'green technologies' in the context of an Emerging Nation's and as CCEP does not need any form of fuel it is a natural fit,

As the UniTech Campus is adjacent to the Busu River the establishment of a CCEP Plant to power same and provide a working example as the basis of information sharing i.e. 'how to' courses from concept to completion is envisaged.
The funding sought will underwrite site analysis and response planning, FEED and associated activities for the Busu river plant; plus, hand in hand with the DGFI provide ongoing maintenance training courses and via a **Research** and **Consultancy Centre**, (RACC) state of the art advice and guidance as innovation e.g. the exponential growth of **AI** has increased the need (and power and cooling) for Data Centres across Australasia, Southeast Asia and Oceania.

Keywords: Clean Energy, Water Harvesting, Food Security, Carbon Credits

*Speaker

Community-Driven Adoption of Industry 4.0 Technologies for Sustainable and Resilient Food Production

Shiva Abdoli * [1]

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T Industry 4.0 technologies such as artificial intelligence (AI) and digital twins offer significant opportunities for improving sustainability and efficiency in food production. However, their adoption remains limited, especially among small and medium-sized enterprises (SMEs) and in contexts where manual operations are still necessary. This project presents a community-driven framework to support the integration of these technologies in local food production systems. By combining technical development with community engagement, the research addresses both operational optimization and existing digital skill gaps. Pilot implementation of digital twin models will be validated for their impact on production efficiency. This research contributes to the broader digital and green transition by aligning advanced technologies with local needs, ensuring that innovation is inclusive, practical, and socially grounded.

Keywords: Industry 4.0, digital twin, Community, Driven, Food production, Sustainability

*Speaker

Comparative Analysis of Tree Diversity, Composition, and Structure in Selectively Logged Lowland Tropical Forests: A Case Study from Isabel Island, Solomon Islands

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[1] University of Canterbury – Christchurch, New Zealand
[2] Solomon Islands National University – Solomon Islands

This study uses a chronosequence approach to investigate species composition, tree diversity, and stand structure in post-logged lowland tropical forests on Isabel Island, Solomon Islands. The recovery dynamics of canopy trees and understory saplings were assessed in three forest types: unlogged forest and forests logged 3 years and 20 years ago.
Vegetation data were collected using stratified random sampling across all forest categories. A total of 168 tree species from 92 genera and 43 families were recorded. Species richness was highest in the unlogged forest (116 species), followed by the 20-year-old forest (110), and the 3-year-old forest (95). Tree diversity in both canopy and sapling layers was significantly lower in the recently logged (3-year) forest compared to the unlogged forest. Although the 20-year-old forest showed improved sapling diversity and richness, the species composition remained distinct from the unlogged condition.

Stand structure analysis revealed rapid regeneration of pioneer species-particularly *Macaranga* spp.-in the 3-year-old forest, resulting in high sapling stem density and basal area. However, canopy stem density was significantly reduced in this forest. In contrast, the 20-year-old forest exhibited no significant difference in canopy stem density compared to the unlogged forest but showed a marked reduction in large-diameter commercial species (DBH $\geq$ 60 cm). The basal area of canopy trees remained lower in both logged forests relative to the unlogged forest.
These results indicate that while structural attributes such as stem density can recover within two decades, species composition and timber stock require more time. The results underscore the need for longer rotation periods and active restoration strategies to sustain biodiversity and forest productivity in logged tropical forests.

Keywords: Selective logging, Tree diversity, Forest structure, Chronosequence, Species composition, Basal area

*Speaker

Comparative study of the population and population density of sea star species along the intertidal zone of Honiara City and West Guadalcanal in Solomon Islands.

John Rofeta * [1,2,3]

[1] Magret Konata – Solomon Islands
[2] Brenda Ramoi – Solomon Islands
[3] Kevin Leaman – Solomon Islands

Abstract

This study presents a comparative analysis of the population and population density of sea star species along the intertidal zones of Honiara City and West Guadalcanal, Solomon Islands. Motivated by concerns over climate change and anthropogenic pollution from poor land management, settlements, and industrial development, the research explores how these factors influence marine biodiversity, particularly keystone species such as sea stars. Fieldwork was conducted across four coastal sites-Kukum, Town Ground, (Honiara City), and Blue Flag/Bonegi (West Guadalcanal)-using both random and systematic quadrat sampling methods to estimate population density and diversity of the sea star species. Physical parameters including temperature, salinity, pH, and dissolved oxygen were measured using calibrated digital instruments, while rainfall data were sourced from the national meteorological service in Honiara Solomon Islands. The Shannon-Weiner diversity index was applied to statistically assess inter-site variation. Findings from this study aim to inform conservation strategies and highlight the ecological status of sea star along intertidal zones under increasing environmental stress.

By John Rofeta

Solomon Islands National University

Faculty of Science and Technology

School of Sciences
Department of Biology

Keywords: Population, population density, anthropogenic pollution Climate change, diversity. Physical parameters, Shannon, Weiner diversity index, Ecological status.

*Speaker

Creative Visual Research and Local Strategies for Social Change

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Abstract

Creative visual research is an approach to facilitate development in communities and engage people in meaningful conversation. A creative visual approach allows a democratic, accessible, and immutable space for people to engage in dialogue about challenges and help to document their narratives, which are crucial for understanding local strategies, indigenous knowledge systems, and local values as local responses for social change. This study focuses on the use of creative visual research to create a space that has plural participations giving rise to a plethora of manifestations of local stories about indigenous values as local strategies to achieve safety and governance goals in the urban informal market space. This research involves market vendors who conduct market activities at Awagasi market in Lae, Papua New Guinea (PNG). The market vendors who work in the informal market space, come from all over PNG and reside in urban settlements. They were recruited as participants who shared their stories of challenges, resilience, and change. The stories were foregrounded by Melanesian values of relational reciprocity and respect and culminated into a photo booklet, which was the creative output of the creative visual process. The photo booklet communicates challenges, hardships, and local responses to the everyday watersheds. The implications of the research findings demonstrate that the creative visual method enables vendor participants to share their stories of creativity, resilience, and values of community and solidary by using local mechanisms, processes, and methods to achieve market safety and governance outcomes. The study also presents an alternative account of a vibrant market community, one that is thriving, supporting, and caring for one another.

Keywords: Creative and visual research, market vendors, Indigenous values, local strategies, social change

*Speaker

Customary Land Data Model for a Re-engineered Land Administration System in Papua New Guinea: Promoting Equity and Sustainable Development.

Wycliffe Antonio * [1]

[1] Lecturer – Papua New Guinea

A Customary Land Data Model for a Re-engineered Land Administration System in Papua New Guinea: Promoting Equity and Sustainable Development.
In Papua New Guinea, customary land tenure systems are prevalent. Community elders manage lands based on traditional practices and customs passed down orally through generations. As a result, these lands often remain unrecorded and are excluded from formal land administration systems. The local population relies on these lands for cultural, spiritual, social, and economic livelihoods.

These lands are also rich in natural resources that governments are eager to exploit for economic growth, especially in less developed countries experiencing slow progress. Inadequate governance significantly contributes to the challenges of managing these resources. Implementing Land Administration Systems is essential for achieving effective land management and fostering good governance.

The primary aim of this research was to design and develop a comprehensive data model that incorporates land under customary tenure within a re-engineered land administration system, thereby empowering and supporting customary landowners. This study employed the Design Science Research (DSR) methodology to create a customary land data model for a re-engineered Land Administration System. This initiative seeks to promote sustainable development and improve the socioeconomic well-being of customary landowners. The model has been refined using UML, and a prototype Land Information System has been developed utilising QGIS and Postgresql.

Data from two customary land groups in PNG helped illustrate the model in a case study, demonstrating its technical feasibility and potential operational and economic viability. The model offers significant advantages by aligning with existing land models and addressing the needs of both government institutions and customary landowners.
Based on the study's insights, a strategy has been developed to implement the model in Morobe Province. This strategy focuses on integrating project implementation within government institutions, enhancing awareness through the prototype, fostering collaboration with academic institutions, and facilitating phased, incremental development. Additionally, institutional adaptations and human resource development are essential throughout this process.

*Speaker

Keywords: customary land tenure system, customary landowners, land tenure, design science research, land administration system, land governance, data model, Papua New Guinea, land management, sustainable development, developing countrie

Data lifecycle to support sustainable research in the Pacific

Guillaume Wattelez * [1], Marie Latour [1], Olivier Galy [1]

[1] Université de la Nouvelle Calédonie – New Caledonia

This communication aims to provide an overview of what can the lifecycle of research data be from collection to dissemination and reuse in all the scientific fields. This is an opportunity to present "good practices" and tools that can be useful in daily lives and daily works of researchers. This communication aims to illustrate data life cycle already settled in research projects developed in the Pacific.
Data lifecycle consists of 6 stages: collection, processing, analyzing, storing, sharing and reuse.

Before starting the effective collection of the data, it is very important to plan what will be done with the data throughout the project. This is the aim of the data management plan (DMP) which may and must be modified during the course of the project. Writing a clear and comprehensive DMP enables to think about how the data will comply with the FAIR principles.

This is essential to process raw data if they are to be exploited. For instance, data must be checked, cleaned and validated. The analyzing stage is essential to produce scientific knowledge. At this stage, the data is usually explored in more depth using specialized statistical tools.

Regarding data storage, it is recommended to diversify storage media, one of which should be off-site, like on a cloud or a repository for instance. A far as possible, research data should be shared but the right of access should also be clearly defined. Following the guiding principle "as open as possible, as close as necessary", researchers can share open data or set access conditions. The ultimate aim of all these stages is reuse of data. This contributes to quality of research and scientific integrity, since sharing and reuse of data enable and facilitate peer-reviews, better use of allocated resources and promote the dissemination of research work.
The main expectation of this communication is to make clearer to researchers the processes used in the data lifecycle. This will help to learn about "good practices" and practical tools that can be used to ensure the sustainability of research and improve its contribution towards the society.

Keywords: open science, research data, open data, data management, FAIR

*Speaker

Detection of Social Bot Accounts using Contrastive Learning

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[1] University of New South Wales [Sydney] – Australia

Online social networks have emerged as primary contact points for content consumption, attracting billions of users. However, the open nature of these networks renders them susceptible to orchestrated adversarial campaigns, often facilitated by automated accounts known as social bots. Bots have played a significant role in disseminating misinformation, particularly during the COVID-19 pandemic, leading to the proliferation of incorrect remedies, unproven practices, and various conspiracy theories. Consequently, trust in legitimate sources has been undermined. Therefore, an urgent need exists for the early and efficient detection of social bots. While several methodologies have been proposed for this purpose, substantial research gaps endure. First, current models exhibit limitations in detecting sophisticated bots that seek to mimic genuine online social network users. Second, these methodologies frequently depend on simplistic profile features, which adversaries can manipulate. Additionally, these models lack generalizability, resulting in inadequate performance when trained on one dataset and evaluated on another. To address these challenges, we propose a framework for social bot detection utilising Self-Supervised Contrastive Learning (BotSSCL). Our framework harnesses contrastive learning to distinguish between social bots and humans within the embedding space, thereby enhancing linear separability. The high-level representations derived from BotSSCL bolster its resilience to variations in data distribution and ensure generalizability. We assess BotSSCL's robustness against adversarial attempts to manipulate bot accounts to evade detection. Experiments conducted on two datasets featuring sophisticated bots demonstrate that BotSSCL surpasses other supervised, unsupervised, and self-supervised baseline methodologies. We also illustrate that BotSSCL is dataset-agnostic and generalisable in detecting sophisticated bots across diverse datasets.

Keywords: online social networks, social bots, misinformation, machine learning

*Speaker

Determination of Rainfall-Runoff Relationship for Wadi Dayqah Catchment

Ahmad Sana * [1], Bushra Al-Abri [2]

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[2] Keo International Consultants – Oman

The aim of this study is to investigate the rainfall-runoff relationship for the Wadi Dayqah catchment, Oman. HEC-GeoHMS software was used to delineate catchment boundaries and to determine the sub-catchment areas and their centroids, while HEC-HMS and Excel sheets were used for event modeling and calibration. Three storm events from eight different rain gauge stations, with one Wadi gauge, were used in the study. Phi-index and Green-Ampt infiltration methods were used to model the losses, while the SCS unit hydrograph method, Snyder (Tulsa) unit hydrograph method, and a derived unit hydrograph were used for modeling the transformation process. Inverse-distance method was used for modeling meteorological processes. The developed models using the standard methods did not give reasonable results. Therefore, an empirical relationship between rainfall and runoff volume was developed. The data showed that there is a reasonable exponential relationship between the rainfall depth and the runoff volume of the Wadi Dayqah Catchment. The new relationship was verified by analyzing two storm events and using the observed water level and volume of water in the reservoir, and good agreement was found between the observed and computed runoff volumes. The results of this study will be useful for reservoir management during storm events.

Keywords: Rainfall, runoff relationship, HEC, GeoHMS, Wadi Dayqah, Hydrologic modeling

*Speaker

Development of a Digital Twin to Model and Evaluate Transportation Infrastructure

Vinayak Dixit * [1], Brett Molesworth [2], George Varughese [2]

[1] School of Civil and Environmental Engineering, UNSW Sydney – Australia
[2] UNSW Sydney – Australia

This project discusses the development of a comprehensive Digital Twin framework to model and evaluate transportation infrastructure in the city of Lae, Papua New Guinea (PnG), with a vision to scale the approach to the national level. The Digital Twin will integrate three core modelling approaches: Computable General Equilibrium (CGE) modelling, traffic microsimulation, and human-in-the-loop driving simulator analysis. These three approaches will permit a multidimensional evaluation of transport infrastructure performance, including economic efficiency, network capacity, and road safety outcomes. The digital twin will include assessment and evaluation of all modes including, road, rail, maritime and aviation.
The CGE model will capture the broader economic impacts of infrastructure investment and policy interventions, accounting for inter-sectoral linkages and regional economic disparities. Traffic microsimulation will enable detailed analysis of traffic flow dynamics, congestion patterns, and the effects of proposed network changes on travel times and emissions. The human-in-the-loop driving simulator will be employed to assess human behavioural responses to various road and intersection designs, particularly under conditions unique to Lae and other urban and peri-urban areas of PnG, offering insights into potential safety risks and mitigation strategies.
By combining these models within a dynamic and interactive Digital Twin environment, the project will provide policy-makers, urban planners, and infrastructure developers with a powerful decision-support tool. The approach will support evidence-based planning, improve infrastructure resilience, and guide the equitable scaling of transport solutions across the diverse geographic and socio-economic contexts of Papua New Guinea.

Keywords: digital twin, planning, infrastructure evaluation, Infrastructure Modelling

*Speaker

Digital Education: Status Quo, Developments, Impacts and Challenges @ STEMP, University of the South Pacific

Bibhya Sharma * [1]

[1] The University of the South Pacific – Fiji

With its unique ecosystems and diverse communities, the Pacific region faces challenges such as climate change, resource management and sustainable development compounded with varied maturity levels of technology and resources. Harnessing modern technologies presents a transformative and innovating opportunity to address these challenges while promoting sustainable economies, social well-being and preserving the Pacific Way. In addition, by integrating traditional and indigenous knowledge with technological innovations provides a platform to build tailored solutions to address the unique Pacific problems. Therefore, this paper explores the role of emerging technology such as digital transformation, digital literacy and Artificial Intelligence in addressing these Pacific-centric challenges. Various innovative projects are highlighted in the space of digital transformation and AI as prove of concepts for incorporating traditional knowledge and Pacific needs into digital solutions. The projects further highlight the capabilities available locally for the design, implementation and orchestration of solutions. Also described in the paper is the development of digital and AI-based educational programs such as the ISC Digital Journey that are set to equip specific cohorts with essential skills for the modern workforce. Finally, the paper discusses the roadmap of future developments planned through R&D and the challenges foreseen.

Keywords: Digital education, digital transformation, artificial intelligence, Pacific region, indigenous knowledge, sustainable development, digital literacy, educational innovation, local capacity building, emerging technologies

*Speaker

Digital Literacy at Divine Word University

Philip Gibbs * [1]

[1] Divine Word University – Papua New Guinea

Over the last two decades, Divine Word University, with its "paperless" university policy and the "one laptop per student" initiative has encouraged digital literacy among staff and students. Developments over time saw the introduction of online exams, and the expansion of the Moodle LMS across several campuses. In 2018 DWU conducted an exhaustive study with 289 student participants who were asked to complete sixteen assignments on the internet. The researchers noted necessary operational and formal skills, as well as the importance of developing information and strategic skills to ensure a meaningful and creative use of digital technologies. More recently, during and after the COVID pandemic, the university introduced new tools to support virtual teaching and learning, along with infrastructural upgrades to support those developments. The introduction of AI tools raises new issues of digital literacy, making AI literacy part of student learning. This presentation will identify the most recent issues for students learning digital literacy at Divine Word University.

Keywords: Digital literacy, strategic skills, digital technologies, AI literacy, student learning

*Speaker

Divine Word University, Centre for Learning & Teaching approaches in harnessing technology to contribute to a safer and sustainable development in the pacific.

Hobson Arro * [1], Picky Airi *

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[1] LinkedIn Corporation – Papua New Guinea

Divine Word University is an avid enforcer of enhancing technology in supporting teaching, learning and research. The Centre for Learning and Teaching has been instrumental in adapting technologies that support Divine Word University's teaching and learning practices. This paper highlight the role of technology within a higher education learning context not only as key enabler for learning infrastructure but a tool that can be utilized for education and awareness towards a safer and sustainable development in Papua New Guinea. Content of the paper include insights into the following; AI Literacy, Digital Citizenship, Safe Exam Browser & Turnitin and Lumo a locally trained virtual assistant.
Digital Citizenship and AI Literacy are self-paced courses. Digital Citizenship is important as a digital literacy and awareness tool to influence a safer digital society, one that is sustainable for business and socializing. AI Literacy aims at introducing AI, comparing its potential benefits and risks and reinforce a society that is responsible and uphold ethical standards with AI usage.

Whilst every effort is taken through proactive measures to instill good ethical practices of academic literacy in APA referencing and academic writing, there is still academic misconduct happening. Safe Exam Browser and Turnitin are two preventative measures to uphold and maintain academic integrity of our teaching and learning environment and practices.
Lumo a locally trained virtual assistant is an important innovative approach we have taken to adopt responsive technology that enhances our overall academic support work.

Keywords: Artificial Intelligence, Safe Exam Browser, Turnitin

*Speaker

Documenting Barriers to Female Leadership in STEM at Selected Pacific Island Universities

Gilianne Brodie * [1], Patila Amosa [2], Jimaima Lako [3], Zakia Ali-Chand [3], Mathilde Souchon *

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While barriers to female leadership in science and academia are well-documented globally, evidence from Pacific Island universities remains limited. Existing studies focus on students and teachers at the secondary or undergraduate level, leaving higher level leadership experiences in STEM disciplines underexplored.
To address this gap, we formed a consortium of four PIURN member universities and expert partners in STEM, gender studies, and diversity accreditation. Our project aligns with UN Sustainable Development Goals 4, 5, 16, and 17 and key regional commitments on gender equality. These frameworks recognize that the absence of diversity diminishes innovation and decision-making effectiveness, while our consortium understands that Pacific contexts may differ from western universities.

In academia, leadership pathways are strongly tied to collaborative networks, postgraduate qualifications, and research outputs, yet mentoring and role models for Pacific women in STEM remain scarce. This study is among the first to systematically document the leadership journeys and barriers faced by STEM women in four Pacific Island Universities (USP, NUS, FNU and SINU). Progress to date includes securing funding, establishing a project advisory board, obtaining ethics approvals, co-developing staff, and student surveys, and recruiting local researchers at USP, NUS, FNU, and SINU. Data collection is now underway using a Pacific-focused, mixed-methods approach.
Our research will amplify Pacific STEM women's voices, inform inclusive policy development, and create culturally relevant staff development models, tailored for Pacific institutions and Pacific women.

Keywords: Science, Leadership, STEM, Gender, Equality, Academia, University, Pacific, Barriers, Policy, PIURN

*Speaker

Dynamics of Socio-Religious Transformation in Lifou (New Caledonia): From the Traditional Drehu Order to Missionary and Post-Missionary Hegemony

Zénon Wejieme * [1], Bernard Rigo [2]

[1] TROCA – New Caledonia
[2] CNEP – Université de Nouvelle Calédonie : EA4242 – France

This research offers an ethnographic and historical analysis of social and religious transformations on the island of Lifou, in New Caledonia, following the introduction of Christianity by the London Missionary Society (LMS) in the mid-19th century. The first part of the study reconstructs the foundations of pre-Christian Drehu society, which was centered around *haze* (spiritual forces), chiefly systems, rituals, and clan structures. These elements formed a coherent politico-religious system, interweaving power, territory, and the sacred.
The arrival of missionaries marked a radical rupture. The establishment of the LMS led to the replacement of traditional spiritual and social references with a Christian order, characterized by the centrality of the church, the erasure of *haze*, the reform of rituals, and the institution of a new moral authority. These transformations are explored through the lenses of syncretism, acculturation, and identity recomposition.

From a diachronic perspective, the dissertation also examines the contemporary impact of Pentecostalism, which rekindles tensions between Christian faith and cultural heritage. Through various life stories, it sheds light on internal conflicts, identity reconfigurations, and social fractures within clans.
The research combines ethnographic observation, analysis of missionary archives, and the reflexive position of the author, a native anthropologist from Lifou. This situated perspective provides a nuanced understanding of issues related to transmission, memory, and resistance in a postcolonial context.

Keywords: Christianization, Syncretism, Postcolonial anthropology, Identity reconfiguration, Clan structure, New Caledonia

*Speaker

Effective Communication in Construction Contract Administration: Identifying Key Successes and Failures

Lincoln Sauwa * [1], Stephanie Kisokau *

[1], Donovan Akui *

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Effective communication is crucial to the successful management of construction contracts, enabling clear understanding and collaboration between all stakeholders to achieve deliverables for projects of varying complexity. The problem of the present research can arise from the keys to project success and failure as causes and effects. Key successes derive from clear communication channels, active listening, and effective management of change orders. Failures often stem from vague instructions, poor documentation, and inadequate stakeholder involvement, leading to misunderstandings and delays. The aim of this paper is to examine the critical role of effective communication in construction contract administration and to determine how it can be further enhanced as an effective partnership through building information modeling (BIM) as a digital process. This study attempts to identify key factors contributing to successful project outcomes and examine common communication failures that lead to disputes and delays by reviewing prominent published research in the field of BIM, communication, and contract management. Also, BIM significantly enhances communication in construction contract administration by providing a common, centralized platform for information exchange and collaboration, ultimately leading to fewer misunderstandings, better coordination, and improved project outcomes.

Keywords: Effective communication, Construction Contract Administration (CCA), Building Information Modeling (BIM), project outcomes

*Speaker

Effective Communication in Construction Contract Administration: Identifying Key Successes and Failures

Lincoln Sauwa * [1], Dr. Meysam Khoshnava *

[1], Stephanie Kisokau *

[1], Donovan Akui *

[2]

[1] Papua New Guinea University of Technology, Faculty of Built Environment, The School of Architecture and Construction Management – Papua New Guinea
[2] o BIM and ICT impact on cost overruns or budget accuracy. – Papua New Guinea

Effective communication is crucial to the successful management of construction contracts, enabling clear understanding and collaboration between all stakeholders to achieve deliverables for projects of varying complexity. The problem of the present research can arise from the keys to project success and failure as causes and effects. Key successes derive from clear communication channels, active listening, and effective management of change orders. Failures often stem from vague instructions, poor documentation, and inadequate stakeholder involvement, leading to misunderstandings and delays. The aim of this paper is to examine the critical role of effective communication in construction contract administration and to determine how it can be further enhanced as an effective partnership through building information modeling (BIM) as a digital process. This study attempts to identify key factors contributing to successful project outcomes and examine common communication failures that lead to disputes and delays by reviewing prominent published research in the field of BIM, communication, and contract management. Also, BIM significantly enhances communication in construction contract administration by providing a common, centralized platform for information exchange and collaboration, ultimately leading to fewer misunderstandings, better coordination, and improved project outcomes.

Keywords: Effective communication, Construction Contract Administration (CCA), Building Information Modeling (BIM), project outcomes

*Speaker

Effectiveness of lifestyle interventions for obesity prevention among adolescents in Pacific Islands Countries and Territories

Olivier Galy * [1,2], Marie-Jeanne Urvoy [2], Solène Bertrand [2], Corinne Caillaud [3], Jacquie Bay [4], Stéphane Frayon [2], Guillaume Wattelez [2], Margaret Allman Farinelli [3], David Raubenheimer [3], Rachel Novotny [5], Anthony Okely [6]

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This narrative review belong to a series commissionned by The Lancet Regional Health: Western Pacific. It summarise published research on lifestyle interventions (physical activity and diet) for obesity prevention among adolescents in Pacific Islands Countries and Territories (PICTs). We searched from the year of inception of electronic databases up to and including June 2024 to identify French and English publications in twenty-two PICTs. Of the 2068 publications identified, nine were included, involving adolescents (11.8-15.4 yrs) from Fiji, Tonga, New Caledonia and French Polynesia. While changes in body composition, physical activity and diet were noted, key aspects analysed were sociocultural, spatial and temporal dimensions considered in the interventions. The impact of lifestyle interventions on body composition were variable. In rural areas, community involvement and traditional activities were associated with positive outcomes. Future research should promote standardised an digitalised methods and metrics, involving adolescents, teachers, educators, families, policy-makers, community and spiritual leaders in co-design, that aggregates sociocultural, spatial, and temporal factors.

Keywords: digital intervention, physical activity, diet, overweight, health, children, Melanesia, Polynesia, co, design, youth.

*Speaker

Empowering Pacific Island Universities for Safe and Sustainable Development through Geospatial Technologies

Jean Massenet * [1], Frédéric Huynh [2,3], Laurent Durieux [2,3], Marc Despinoy [4,2], Pearl Winchester [2,3]

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Pacific Island Countries and Territories (PICTs) face growing challenges: climate change adaptation, biodiversity conservation, sustainable resource management, digital development, and cultural preservation. In this context, geospatial technology has become an essential, cross-cutting tool, providing accurate information and innovative solutions for decision-makers and communities.
However, building sustainable, locally anchored geospatial ecosystems remains difficult due to limited expertise, high staff turnover, and fragmented institutional responsibilities. Strengthening national universities emerges as a pivotal solution to overcome these barriers. Universities not only educate future professionals but also bridge governments, research bodies, private sectors, and civil society. They have the unique position to act as facilitators of collaborative, inclusive, and representative geospatial initiatives at both national and regional levels.

This presentation is basd on a dual vision.

Firstly, it emphasizes the need to structure local geospatial dynamics by empowering universities to lead bottom-up, community-driven processes. These processes should collectively identify priority needs, propose actionable solutions, and build long-term local expertise and capacity.

Secondly, it highlights the importance of regional collaboration. Many Pacific islands face similar geospatial challenges but operate with limited resources. Therefore, fostering regional synergies through university networks enables knowledge sharing, resource pooling, and collective action. Strengthening inter-university collaboration can significantly accelerate safe and sustainable development across the Pacific.

*Speaker

Both approaches-local structuring and regional integration-align directly with the theme of the 6th PIURN Conference: mobilizing technology for sustainable Pacific futures while valuing traditional knowledge. By reinforcing Pacific universities' roles in the geospatial sector, we can support resilient communities, preserve natural and cultural heritage, and enhance the sovereignty of Pacific peoples over their data and resources.
This contribution will share ongoing initiatives, lessons learned, and perspectives for scaling up these efforts across the region, ensuring that geospatial solutions are truly designed by and for Pacific Islanders.

Keywords: geospatial, capacity building, pacific universities, regionale integration, sustainable development

Enhancing Animal Health Capacity in Papua New Guinea: Establishing the Faculty of Para Veterinary Sciences at a Higher Education Institution

Stephanie Tringin * [1], Sinafa Robby [1]

[1] Papua New Guinea University of Natural Resources Environment – Papua New Guinea

Papua New Guinea (PNG) faces a pressing need for skilled animal health professionals to support sustainable agricultural productivity and food security. The establishment of a Faculty of Para Veterinary Sciences aligns with PNG's Vision 2050 and the National Food Security Policy 2018–2027, aiming to cultivate a knowledgeable, skilled workforce to meet the country's growing agricultural and public health demands.
Despite PNG's reliance on agriculture and livestock, the country lacks sufficient veterinary professionals to address animal health challenges, disease mitigation, and food security concerns. The absence of a dedicated academic faculty for para veterinary sciences has created gaps in education, research, and field application, limiting PNG's ability to manage zoonotic disease risks and ensure robust biosecurity measures.

The proposed Faculty of Para Veterinary Sciences will introduce academic programs such as a Bachelor in Para Veterinary Sciences, a Postgraduate Diploma in Veterinary Sciences, and a Master of Global Health Security. With a potential to be positioned at an appropriate exisiting national Department of Agriculture (& Livestock) station, this faculty will leverage a public-private partnership to revitalize the site as a hub for animal health education and research. An interdisciplinary One Health approach will be integrated to emphasize the interconnectedness of human, animal, and environmental health, ensuring a holistic strategy for disease prevention and biosecurity.

The faculty's initiatives-such as the annual Animal Health Symposium, Farmer Training Field School, and One Health Multisectoral Workshops-will strengthen research collaboration, professional development, and community preparedness. Moreover, public outreach efforts through radio broadcasts and podcasts under *"Singaut Bilong Kumul"* will enhance awareness of animal health and biosecurity concerns while positioning PNG as a regional leader in veterinary education.
By addressing key gaps in veterinary education and research, the Faculty of Para Veterinary Sciences will empower graduates with essential knowledge and skills to support agricultural sustainability, enhance food security, and improve biosecurity measures. This initiative will reinforce PNG's commitment to fostering a resilient workforce capable of meeting the dynamic challenges of public health and animal health in an evolving global landscape.

*Speaker

Keywords: Para Veterinary Sciences, animal health education, biosecurity, One Health approach, food security

Enhancing Medical Education through Digital Innovation at Divine Word University (DWU)

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In response to the evolving demands of 21st-century medical education, the Department of Medicine has implemented a range of digital innovations aimed at enhancing the delivery and effectiveness of its medical program. This presentation explores the integration of advanced technologies and pedagogical strategies to enrich teaching, learning, and clinical training.
Key innovations include the use of enhanced virtual reality tools such as digital cadavers and virtual simulated clinical cases, alongside the development of DWU's own virtual interactive case scenarios. These resources provide students with immersive, practical learning experiences that bridge the gap between theory and clinical application.

To develop didactic materials and benchmark the new Medical School at DWU to world standards, the Department of Medicine obtained access to world-standard medical online teaching and learning platforms such as AMBOSS, Lecturio and Clinical Key Elsevier online library.

DWU in all programs, fully employs Moodle as a teaching and learning platform. Blended course delivery, utilizing flipped classroom models in conjunction with evidence-based pedagogical approaches like Case-Based Learning (CBL) and Team-Based Learning (TBL), has been introduced to promote active, student-centered learning. Complementing this, a state-of-the-art simulation laboratory has been developed, featuring digital mannequins (SimAnn) and SimScope to replicate real-world clinical scenarios in a controlled and safe environment.

Further digital enhancements include the adoption of online examinations, the creation and integration of instructional videos, and the strategic use of social media platforms such as WhatsApp for academic communication, peer collaboration and learning. The implementation of telemedicine has also broadened students' exposure to remote clinical care models, preparing them for modern healthcare challenges.
This presentation highlights DWU's commitment to advancing medical education through innovative digital practices that foster clinical competence, collaborative learning, and adaptability in future healthcare professionals.

Keywords: medical education, digital innovation, virtual cases, virtual reality, blended teaching, simulation technique, online learning platforms, online library, social media

*Speaker

Enhancing Weather Forecast Accuracy in the Solomon Islands: A Machine Learning-Based Statistical Analysis of Climate Change Using Smart Classifier Algorithms

Timothy Girry Kale * [1], Satoshi Ohzahata [2]

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[2] The University of Electro-Communications – Japan

This research explores the development and evaluation of machine learning-based predictive models for weather forecasting in the Solomon Islands, a region highly vulnerable to climate change impacts such as severe flooding and rising sea levels. Traditional numerical weather prediction (NWP) models, though widely used, are often limited by computational complexity and reduced accuracy in local forecasts. This study proposes the integration of smart classifier algorithms with statistical analysis to enhance forecasting precision and reliability. Using datasets from the Solomon Islands Meteorological Services, GTS weather network, and Kaggle, the research employs five classifier algorithms, Random Forest, Decision Tree, Gaussian Naïve Bayes, Support Vector Machine, and Neural Network to forecast key weather parameters such as rainfall, temperature, wind, and fog. Preliminary results indicate that the machine learning models outperform existing forecasting techniques in both prediction speed and accuracy. This data-driven approach offers a practical, efficient alternative to conventional forecasting systems and supports improved disaster preparedness and decision-making in sectors like agriculture, transportation, and tourism. Further empirical testing with updated datasets is recommended to validate the models and strengthen predictive capabilities amid evolving climate conditions.

Keywords: climate change, weather report, classifiers, random forests, decision tree, neural network

*Speaker

Estimation of lifetime lung cancer risk from radon inhalation in Lae, PNG

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There are several known factors causing lung cancer. The major sources are exposure to nanoparticles, polycyclic aromatic hydrocarbons (PAHs), and inhalation of radioactive radon gas. The World Health Organization (WHO) estimates that radon exposure accounts for approximately 3% to 14% of all lung cancer cases, depending on factors like average radon levels and smoking habits. Research in a Southeast Asian country estimated that 26% of lung cancer deaths in males and 28% in females were attributable to indoor radon exposure, with variations depending on local radon concentrations. Radon is the second leading cause of lung cancer in the United States, after cigarette smoking. The EPA estimates that about 21,000 people die each year as a result of radon-related lung disease.
Radon is radioactive and can decay into cancer-causing radioactive progeny. These progenies stick onto the Tracea-Bronchial region of the lung and continuously irradiate the lung tissues unless some physiological process translocates them.
Radon needs to be measured for a long time in the indoor atmosphere to obtain a time-averaged estimate of the inhalation dose to the inhabitants. Active radon measurements are more accurate, even if they are difficult to deploy for measurements. In the present study, the results of measurements of year-long continuous indoor radon measurements at different locations in the city of Lae in PNG will be presented. Using the results of the measurement of indoor radon activity, the excess lifetime risk due to the inhalation of radon will also be presented.

Keywords: Radon, inhalation, radiation dose, excess cancer risk

*Speaker

Evaluating Internet Speed, Accessibility, and Connectivity in the Solomon Islands: A Mixed-Methods Survey Study

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This study critically examines the state of internet connectivity in the Solomon Islands, with an emphasis on evaluating the performance of key Internet Service Providers (ISPs), namely Our Telekom, Bmobile-Vodafone, SATSOL, and Starlink. Since the inception of internet services in the late 1990s through dial-up connections, the nation has gradually adopted broadband and mobile technologies. Despite these advancements, substantial disparities remain, particularly between urban centers and remote rural communities.
The recent commissioning of the Coral Sea Cable System has significantly enhanced international bandwidth and the overall reliability of connectivity. Nonetheless, persistent challenges including high service costs, limited infrastructure, and inconsistent coverage continue to impede equitable access and digital inclusion across the country.

Adopting a mixed-methods approach, this research integrates quantitative metrics such as internet speed tests and latency measurements with qualitative data obtained from user surveys and stakeholder interviews. This methodological triangulation provides a nuanced understanding of internet performance, service accessibility, connection reliability, and user satisfaction across diverse geographic and socio-economic contexts. Furthermore, the findings are contextualized within the broader digital development challenges facing Pacific Island nations, where infrastructural limitations and constrained market competition often restrict the quality and reach of internet services.
The study aims to inform evidence-based policy development and investment strategies that support inclusive, resilient, and high-performing digital infrastructure in the Solomon Islands. The outcomes are expected to benefit a wide range of stakeholders including the Solomon Islands National University (SINU), government ministries, private sector actors, and development partners by contributing to national objectives in education, healthcare, governance, and economic growth through improved digital connectivity.

Keywords: Internet Connectivity, Internet Service Providers (ISPs), Digital Inclusion, Digital Infrastructure

*Speaker

Experimental Investigation on laminated wooden composites of selected Papua New Guinean woods for sustainable structures

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Two species of woods frequently available in Papua New Guinea (PNG) were experimentally investigated for their sustainability, suitability and effectiveness in engineered laminated wood fabrication. Higher strength to weight ratio was achieved by fabrication of kwila-rosewood-kwila configuration in comparison to rose wood. The 4-point flexural bending test, as described in ASTM D198, is performed with a 1000 kN capacity UTM. The flexural stiffness of rosewood is observed to be 1377.73 N/mm2 while that of the kwila rosewood laminated specimen is 1816.41 N/mm2. The kwila-rosewood-kwila laminate exhibited higher bending stiffness than rosewood. Liquid Nails adhesive is used due to limited availability of high-grade adhesives. The bending stiffness could be significantly improved by using structural glues which were not available within the first phase of this larger project. Though kwila (830kg/m3) is denser than rosewood and all kwila laminates exhibited highest stiffness, it is the heaviest and hence not suitable for weight critical structures which is a necessity in PNG for frequent earthquake. Moreover, cost involvement in engineering all kwila laminate is also higher. The kwila-rosewood laminate is cheaper in cost than all kwila laminate and reduces weight effectively making them more suitable for safe and sustainable structures due to their higher strength to weight ratio and better sustainability under earthquake loadings.

Keywords: Sustainability, laminated, earthquake, kwila, rosewood

*Speaker

Exploring Relevance and Benefits of OBE TV Lessons to PNG and the factors affecting broadcasting of TV Lessons in TV School Media Center now e-learning Division.

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TV Lessons are Mathematics and Social Science Lessons which were taught by best teaching and learning meterials and resources which was provided by the Department of Education. The These lessons were delivered from outcome based curriculum which were on the air from 2005 to 2016. It was introduced during Japanese International Corporation Agency (JICA) inception in 2005 in partnership with department of education. (NDoE), and till 2016. TV lessons are no longer prepared and delivered as they were with the implementation of the OBC. This program had assisted the teachers in remote schools Mathematics and Science Lessons who often have difficulties in teaching and the same time it addressed the issue of teacher shortage and capacity. The However, I since the introduction of standards based education in 2015 there has not been any TV lessons. This study was carried out to find out the views of the officers concern about the relevance and benefits of TV Lessons for PNG and their views on how it can be used to deliver standard based lessons. Also to find out if you about factors currently affecting broadcast airing of TV lessons. The data was collected from staff in the curriculum and assessment division and the department of education and the other offices who had connections with preparation and presentation of TV lessons. Findings shows that (1) TV lessons are relevant and beneficial for PNG and needs to be continue (2) TV lessons are not prepared and presented as they used to be (3) Hindrances to preparing and presenting TV lessons is due to lack of needed resources and technological knowledge and skills; and lack of funding; (4) There is a need for revising TV lessons, and preparation and presentation, and with the needed support which include funding resourcing of TV lessons preparation and presentations. It can be concluded that TV teaching is relevant for teachers and students in PNG, especially the teachers and students from remotest parts of PNG where good science and mathematics teachers, and teaching and learning meterials and facilities are lacking.

Keywords: TV Lessons, Broadcasting, remote school's, relevance benefits, outcome based curriculum, standard based curriculum

*Speaker

Exploring teacher's and parent's perceptions about mobile phone and it impact on primary and secondary students

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Exploring teacher's and parent's perceptions about mobile phone and it impact on primary and secondary students
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July 2025

Using of mobile phone is a social development that also has negative effects. This study was carried out in Divine University, among the master students. It is a mixed-methods research study carried out to explore teachers and parents view about the access to, usages of mobile, and impacts associated with mobile phone use among students in primary and secondary schools in Papua New Guinea. The data was collected using questionnaire which collected both quantitative and qualitative data because it had structured and unstructured questions. Teachers and parents from PNG who are studying at DWU were used. There are several findings as follows: (1) students have access to mobile phones, and they use them as tools for communication and education; (2) students use mobile phone for completing assignments, correcting spellings and grammar, and accessing online resources; (3) Benefits for students are learning and communicating is fast with the use of mobile phones. Apart from the benefits, the study also identified some negative impacts of using mobile phones which includes: (1) distractions from study time; (2) decline in the quality of academic writing; and (3) concerns such as lack of control and guidance for mobile phone use in schools. Thus, there is a need for balanced policies that harness the educational potential of mobile phones while mitigating their adverse effects on student well-being and academic performance.
Mobile Phone; Communication; Benefits; Grammar; Impact; Harnessing uses; Mitigating impact;

Keywords: ds Mobile Phone, Communication, Benefits, Grammar, Impact, Harnessing uses, Mitigating impact

*Speaker

Exploring the Transition Experience of International Students at the Solomon Islands National University in 2024: A Mixed-Methods Study.

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[1], Marineth Dereveke [1], Rudgard Palapu [1], Collin Benjamin [1], Clement Lifoia [1]

[1] SINU – Solomon Islands

Background
International students face challenges in adjusting to new educational and cultural environments. At Solomon Islands National University (SINU), these challenges may be intensified by the unique cultural and geographic context of the Solomon Islands. Since 2023, SINU has enrolled international nursing students from Vanuatu, yet little is known about their transition experiences. While such research is common in developed countries, this study fills the gap by exploring international student transitions in a Pacific Island context.
Methods
This mixed-methods study involved 30 randomly selected Vanuatu students enrolled in the 2024 nursing program. Data collection methods included semi-structured interviews, focus group discussions, and surveys, conducted via the Kobo Toolbox application. Qualitative data were thematically analysed, and survey data were analysed using Excel for descriptive statistics. Ethical approval was obtained, and confidentiality and voluntary participation were ensured.

Results
Over 70% of students reported difficulties with Solomon Islands Pijin, affecting classroom participation. Academic barriers included overcrowded classrooms, limited seating, and digital challenges, with 60% citing poor internet connectivity. Moodle was valued but hindered by delayed content and lack of training.

Socially, 65% experienced cultural shock due to local customs like betel nut chewing and ceremonial practices. However, peer mentoring, church support, and events like cultural nights supported integration and emotional resilience. Over 80% reported improved confidence and cultural understanding through group activities.

Logistically, more than 75% faced challenges such as expensive hostel accommodation, lack of transitional housing, visa and registration delays, and transport issues. Despite significant academic, cultural, and logistical challenges, students appreciated the support of staff and peers, which eased their transition
Conclusion
While SINU provides a supportive environment, targeted improvements are needed. Estab-

*Speaker

lishing a dedicated international student office, enhancing orientation programs, and offering subsidized accommodation can address key academic, cultural, and logistical challenges ensuring smoother transitions and enriching the overall experience for international students studying in the Solomon Islands.

Keywords: International students, Transition experience, Cultural adaptation, Higher education, Solomon Islands National University (SINU)

Faith-based Organisations and Community Water Management in the Solomon Islands: Results of an Action Research Intervention in Isabel and Western Province.

Collin Benjamin * [1], Sheilla Funubo [1], Hugo Bugoro [1], Nixon Panda [1], Mark Love [2]

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The Community Water Management model in the Solomon Islands is not working. The government estimates that over 50% of water systems in rural communities are not functioning, and many systems have not reached their designed lifespan. The government recognizes the importance of faith-based organizations in rural development and mentions churches as potential service delivery partners, but this has not yet materialized in practice.
The study describes the role of Faith-based Organizations in supporting community-based water management in the Solomon Islands.

A team from the International WaterCentre/Griffith University and Solomon Island National University worked with church leaders across various denominations in Isabel and Western Provinces. The action research program included workshops, the implementation of Action Plans, and monitoring. Action Plans were created for 18 communities-11 in Western Province and 7 in Isabel. The impact assessment was conducted in 9 communities through interviews (n=86) and observations, with interviews recorded in Solomon Islands Pidgin, transcribed, translated into English, and coded using NVivo®.

The church is seen as a respected institution that can leverage its platforms for awareness, motivation, and training in both provinces, but differs slightly in their existing capacities and approaches to addressing community challenges. In the Western Province, there was a greater emphasis on existing health structures within the church. In Isabel, participants focused more on clergy involvement and vocational training.
While there are challenges – such as finances, leadership changes, and disagreements between different church groups – the study shows that working with faith-based organizations on community water management in the Solomon Islands has great potential. Monitoring captured increased awareness and fundraising, establishment of new governance structures, and cleaning around water access points. The study recommends establishing a formal partnership between the church and the provincial environmental department to strengthen community water management. This collaboration would involve water committee members in church-led community projects, fostering unity across different denominations. Additionally, training and informational sessions for church leaders would equip them with the knowledge and skills to support sustainable water resource management within their communities

*Speaker

Keywords: Faith, based organization, community water management, church awareness, monitoring and motivation, capacity building, governance structure, behavioral change, partnership, interdenominational collaboration

Food and forestry biomass, an alternative for the removal of hexavalent chromium under natural conditions

Cynthia Sinyeue * [1], Redwane Yalcin [1], Isabelle Desriaux [1], Monika Lemestre [1], Aurélie Monin [2], Nicolas Lebouvier [1], Peggy Gunkel-Grillon [1]

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Over the past decade, chromium pollution has garnered researchers' attention due to its harmful effects on ecosystems and human health. In New Caledonia, open-cast nickel mining contributes to the release of metals into waterways, especially chromium, including its carcinogenic form, chromium VI (Cr(VI)). Chromium concentrations in watercourses can exceed the 50μg/L threshold the World Health Organization recommends for drinking water quality. Plant biomass can be considered as an ecological and low-cost solution for mitigating the ecotoxicological and sanitary risks associated with chromium enrichment in watercourses. The DECHRO project, funded by the Foundation of the University of New Caledonia aims to investigate the ability of biomasses to limit the Cr(VI) concentrations under physico-chemical conditions of watercourses. Various types of biomasses were tested, including three agricultural wastes (passion fruit peels, banana peels, and filtered coffee beans) and three forest biomasses (sawdust and bark from maritime pine and coconut fibers). Raw biomasses were characterized (pHz, FTIR, MEB, SEM) and then tested for 7 days in a solution whose pH, temperature and Cr(VI) initial concentration were parameterized (pH 7-8, T$\circ$C =25$\circ$C, 100μg/mL). Kinetics of Cr(VI) removal by biomasses were studied. Analyses combining ionic chromatography and inductively coupled plasma mass spectrometry (ICP-MS) provide a better understanding of the mechanism of chromium elimination in solution. Passion fruit peels and banana peels convert over 90% of Cr(VI), leading to the hypothesis of a direct Cr(VI) reduction mechanism into non-toxic Cr(III). Pine bark is a good candidate (85%), followed by maritime pine sawdust (35%) and coconut fibers ($< 20\%$). These biomasses have been pre-treated to improve their ability to limit Cr(VI) in solution. SEM microscopy analysis revealed a general biomass structure particularly propitious to pollutant trapping. The molecular composition of each biomass plays a significant role towards Cr(VI). These results, obtained using ecological solutions under natural conditions, enable us to propose these plant biomasses as promising candidates for the implementation of biofilters to safely and sustainably trap toxic Cr(VI) in watercourses.

Keywords: Biomass, Food, Forestry, Chromium, Depollution, watercourses

*Speaker

From Artificial intelligence to Artificial Intelligences

Zhaohao Sun * [1]

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Artificial intelligence is over; artificial intelligences are booming around us. Artificial intelligence is significant for many people as a discipline; where Artificial intelligences have been benefitting all people, organizations, companies, and nations. This paper examines artificial intelligence, the evolution from AI to artificial intelligences; it will look at artificial intelligence systems and platforms as an example of artificial intelligences. The proposed approach in this paper might facilitate the research and development of AIs, artificial wisdom, business intelligences and business analytics.

Keywords: Artificial intelligence (AI), Artificial intelligences (AIs), artificial wisdom, business intelligences, and business analytics.

*Speaker

From Suspicion to Trust: ICP Blockchain's Role in PNG Aid Accountability"

Daniel Yatukoman * [1]

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This paper is written to combat corruption, the ministerial slowness, and the overall lack of real-time control within Papua New Guinea's(PNG's) current centralised Charity aid system in distributing aid throughout the country. These problems concerning the structure of how Papua New Guinea(PNG) aids distribution, they are big cause of widespread mishandling of resources resulting to a big decline in donor trust, which has drastically impacted development process at the ground level(local Level) and up with a high decreased in external support. In contrast, through platforms like the Internet Computer Protocol (ICP) which is one of the current top tier emerging Public Blockchain Technology in operation right now, this study will be exploring how blockchain technology applications may be able to improve the day to day functions, accountability, and transparency in the aid distribution industry. This study will also be examining the possibility, advantages, and any drawbacks of deploying a workable blockchain-based solution in PNG's complex social and infrastructure setting, basing on a thorough analysis of recent academic studies, technical studies, and policy papers that are already in the field. According to the research overview and analysis of several papers, blockchain may greatly impose an increase in transparency by offering unchangeable records that builds donor confidence back by tracking funds in real time, and reducce the number of administrative workloads by using automated smart contracts. However, there still lies some significant obstacles such as an inadequate infrastructure, the low levels of digital literacy, and an undeveloped regulatory framework must be addressed for a chance in such technology to be successfully adopted. PNG may be a third world country and still developing, but we have the capacity to turn things around if proper studies is carried out pointing out the weakness in our economy and focusing on technological innovations to help revolutionize it, by doing so improving its state. So, in order to promote blockchain as one revolutionary tool that may restore faith in the humanitarian sector of Papua New Guinea, the study ends with strategic policy proposals for the incorporation into the assistance management frameworks

*Speaker

Keywords: Blockchain, Internet Computer Protocol(ICP), Charity and aid, aid distribution, Real-time Monitoring

GIVING MODERN NAMES TO LEARNING PRACTICES AND PRINCIPLES THAT ALREADY EXISTED IN INDIGENOUS ISLAND CULTURES.

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A lot is said and taught about modern strategies to learning in education. This concept paper would like to argue that most of the learning practices and principles deemed "new" in the academic circle and taught in textbooks are not new at all. These principles have been practiced in the indigenous culture long before formal education was introduced by missionaries and colonizers. The concept of cooperative learning, creativity, innovation, lifelong learning, learning by observation, learning by doing, apprentice, storytelling, assessment and evaluation (just to mention a few) were all there already. The formal western education simply gave names to learning practices that already existed in the local indigenous communities. From this perspective, the current modern view towards learning should take a renewed intentional approach in teaching based on principles of learning that already existed. While the world is changing technologically in enhancing learning, the principle of learning is basically the same.

Keywords: Indigenous Knowledge, Education, Learning Practices

*Speaker

Green-gold Entrepreneurship in the Pacific: Leveraging Survival Technology?

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The expansion of 'entrepreneurship' in the early 18th and 19th century during the industrial revolution was more focused on large-scale manufacturing and technological innovations as compared to rise of corporations and mass production. After the Post-War Era, entrepreneurship excel with global expansion plans and encouragement of technological advancement like the creation of Silicon Valley. Now, the entrepreneurship in the 21st Century present a digital age, where the world looks into the internet and digital technologies and housing online businesses and startups. While investing with profit-in-mine, a *new* space for entrepreneurship is now concerns with promoting sustainable environment and minimizing social issues. There's no or less talk on green-gold entrepreneurship in the Pacific Small Islands States (PSIDS) due to its limited access for geopolitical reasons. The study examined the governance and management of green-gold entrepreneurship and revealed that support and accessibility to information on green-gold, green financing and institutional creation are lacking concerns at intergovernmental level. With positive focus, green-gold entrepreneurship can play a crucial role in promoting economic development and reducing social issues. The technology not only stimulate economic activity but also contribute to reduce poverty by providing employment and improving living conditions for marginalized communities for survival. The *new* green-gold concept has potential to supports the achievement of multiple Sustainable Development Goals (SDGs), including those related to climate action, economic growth, and social inclusion.

Keywords: Green, gold, Entrepreneurship, Sustainable Development

*Speaker

Harnessing Fuzzy Algebra and Mathematical Modelling for Safe and Sustainable Development in the Pacific Region

Ramanuja Kotti * [1], Timothy Kale [1]

[1] Solomon Islands National University – Solomon Islands

The Pacific region faces significant challenges in achieving sustainable development due to environmental vulnerabilities, economic constraints, and technological limitations. This paper explores the application of fuzzy algebra and mathematical modelling to enhance decision-making processes in sustainable resource management, infrastructure development, and climate resilience. By leveraging fuzzy logic systems, we propose a robust mathematical framework that integrates uncertainty management into climate adaptation strategies, renewable energy optimization, economic planning, and fisheries management. Our results demonstrate that the integration of fuzzy algebra with technology-driven solutions can significantly improve predictive analytics, resource allocation, and strategic planning. A case study on fisheries stock management in the Solomon Islands illustrates how fuzzy logic can optimize sustainable fishing quotas while mitigating the risks of overfishing. This study provides a pathway for policymakers and researchers to adopt innovative mathematical tools for safe and sustainable development in the Pacific.

Keywords: Fuzzy, Algebra, Decision Making, Predictive Analytics

*Speaker

Harnessing ICT to Bridge Gender Gaps in Access to Higher Education in Papua New Guinea

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This study investigates gender disparities in access to higher education in Papua New Guinea, with a particular focus on the structural, socio-cultural, and digital barriers that limit educational opportunities for female students. Centred on a private university in Papua New Guinea, the research adopts a mixed-methods approach, drawing on quantitative data from institutional records and qualitative insights from interviews with current students and individuals who discontinued their studies. Findings reveal significant gender-based inequalities in enrolment, retention, and completion rates, with female students facing compounded challenges such as financial constraints, cultural expectations, personal safety concerns, and limited access to digital infrastructure and ICT resources. These barriers often disproportionately hinder women's ability to participate fully in higher education, especially in remote and underserved communities. The study underscores the importance of harnessing information and communication technologies (ICT) as a transformative tool to bridge gender gaps in higher education. It proposes targeted interventions such as expanding digital access through community learning hubs, integrating ICT-enabled distance learning programmes, promoting digital literacy among female learners, and developing gender-responsive e-learning platforms. By leveraging ICT, the study advocates for inclusive and sustainable strategies that address both institutional and societal impediments to gender equality in education. The findings offer recommendations for policymakers, higher education institutions, and development partners committed to fostering equitable, safe, and sustainable development in Papua New Guinea and the broader Pacific region.

Keywords: Gender Equality, higher education, digital inclusion, educational disparities, Papua New Guinea

*Speaker

Human Habitability and Economic Growth in Pacific Island Countries

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Climate change is a major and growing challenge for Pacific Island countries. Beyond the dramatic consequences of more frequent disasters and sea level rise, climate change is also reducing the human habitability of these zones. Building on the work of Gajewski, Klein and Tahri (2025), we employ the concept of climate niche and human habitability for oceanic countries. We first document a decline in habitability over the last century. We then show that this has a negative impact on economic output. We show that Australia and New Zealand tend to be more affected than the rest of the world, but the Fiji Islands seem to be better able to cope
with the decline in habitability. This suggests that some adaptation policies, such as those adopted in Fiji, can increase resilience in the context of oceanic islands, which suffer disproportionately from the effects of climate change.

Keywords: Climate Change, Global Warming, Population, Temperature, Humidity. 1

*Speaker

Identification of Nitzschia navis-varingica (Bacillariophyceae), a diatom producing amnesic shellfish poisoning-toxins from Papua New Guinea

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To assess the distribution of the amnesic shellfish poisoning (ASP) toxin-producing diatom *Nitzschia navis-varingica* beyond its previously known range in Asian coastal waters, samples were collected from two sites in Bootless Bay, southwest Papua New Guinea, near Port Moresby. Twenty-one strains of *N. navis-varingica* were successfully isolated and established as clonal cultures. Species identity was confirmed through molecular characterization using ribosomal DNA markers. LSU rDNA phylogenetic analysis revealed that all strains clustered in a monophyletic clade with known *N. navis-varingica* sequences, supported by high bootstrap values. ASP toxin production was initially screened using HPLC with fluorescence detection and confirmed by LC-MS/MS using multiple reaction monitoring (MRM) mode. All eleven strains from Site A showed detectable levels of domoic acid (DA) and isodomoic acid B (IB), with toxin quotas ranging from 0.70 to 4.63 pg cell^{1} (mean: 2.75 ± 1.26 pg cell^{1}, $n = 11$). The toxin profile was composed of 21% DA and 79% IB. From Site B, four out of ten strains produced both toxins, with quotas ranging from 1.40 to 3.84 pg cell^{1} (mean: 2.57 ± 1.17 pg cell^{1}, $n = 4$), and a composition of 52% DA and 48% IB. Further phylogenetic analysis based on ITS2 sequences indicated separation of the isolates into toxic and potentially non-toxic lineages, suggesting intraspecific variation in toxin production. This study provides the first confirmed record of domoic acid-producing *N. navis-varingica* from Papua New Guinea, expanding the known biogeographical range of this harmful species and highlighting the need for continued monitoring of ASP toxins in the region's coastal ecosystems.

Keywords: Domoic acid, amnesic shellfish poisoning, Nitzschia navis, varingica, harmful algal blooms, Papua New Guinea

*Speaker

Impacts of significant earthquake on food systems during the emergency phase and future recommendation- Case study for Port Vila, Vanuatu, Southwest Pacific.

Robson Silas Tigona * [1]

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Ensuring sustainability in food systems following a natural disaster is essential for maintaining nutrition within society. Examining the effects of significant earthquakes on food systems in Port Vila is crucial for deriving lessons that can be replicated in other urban centers across Pacific Island Countries and Territories (PICTs). This study investigates the food systems in Port Vila that were impacted by the devastating earthquakes on December 17, 2024, during the emergency phase. The aim of this study is to determine the effects of significant earthquakes on food systems, identify the factors affecting these systems, and highlight priority issues. Data were obtained from food system stakeholders in Port Vila. The results indicate that decentralization of food system services, proper implementation of municipal regulations, and effective enforcement of curfews are key to maintaining food security during the emergency phase following a significant earthquake in an urban environment. The findings provide localized, practical strategies for post-earthquake food systems management in PICTs.

Keywords: Earthquakes, Emergency period, Food systems, Food security

*Speaker

Implementation of tuberculosis infection prevention and control in rural Papua New Guinea: Towards prioritising actions

Dr Gigil Marme * [1], Prof Jerzy Kuzma [1], Dr Peta-Anne Zimmerman [2], Prof Neil Harris [2], Associate Prof Shannon Rutherford [2]

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Background
Tuberculosis (TB) is a critical public health concern in Papua New Guinea (PNG). TB infection control policy remains an important preventive approach. This study aimed to assess the implementation of this policy in a sample of district hospitals in two regions of PNG.

Methods

The implementation of TB control policy was assessed using a sequential explanatory mixed method approach including a survey method based on the World Health Organization IPC assessment framework, facility assessment at ten district hospitals and validation observations of TB control practices.

Results

The implementation of TB control guidelines was inadequate in participating facilities. Though 80% of facilities had an IPC program, many needed more clearly defined IPC objectives, budget allocation, and yearly work plans. 80% (n=8 of 10) of hospitals had no IPC training and education; 90% had no IPC committee to support the IPC team; and 70% had no surveillance protocols to monitor infections. Similarly, 70% of facilities had a specificTB-IPC program without a proper budget., 80% indicated that patient flow poses a risk of TB transmission; 70% had poor ventilation systems; 90% had inadequate isolation rooms; and though 80% have personal protective equipment available, frequent shortages were reported.

Conclusions

The WHO-recommended TB control policy is not effectively implemented in most of the participating district hospitals. Improvements in implementing and disseminating TB guidelines, monitoring TB practices, and systematic healthcare worker training are essential to improve TB guidelines' operationalisation in health settings to reduce TB prevalence in PNG.

Keywords: tuberculosis, infection control policy, policy implementation, rural hospitals

*Speaker

Improve Cost Overruns factors in Construction Contract Administration (CCA) Through Building Information Modeling (BIM)

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[2]

[1] o BIM and ICT impact on cost overruns or budget accuracy. – Papua New Guinea
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Abstract Cost overruns in construction contract administration (CCA) refer to situations where the actual cost of a project exceeds the budget or initial contract amount, often caused by a combination of factors such as inaccurate estimates, scope changes, and delays, which can lead to financial losses, delays, and disputes. Effective contract administration practices, including accurate cost estimates, clear project scopes, and strong change management, are critical to minimizing cost overruns. Additionally, to reduce additional costs in managing construction contracts, focus on strong contract management, proactive risk assessment, and effective change management. Implement transparent cost control systems, utilize advanced technologies such as Building Information Modeling (BIM), and foster open communication between stakeholders. The aim of this research is to determine the digital representation of the project with BIM to identify potential cost overruns factors in the early stages of CCA, leading to more accurate cost estimates and reducing costly changes during construction. The study methodology is shaped by a critical literature review of previous prominent research and critical discussion to describe early intervention, accurate cost estimation, and strong project management as key to preventing and managing cost overruns. By addressing the contributing factors and effectively implementing cost reductions with these strategies, construction contract managers can significantly reduce the risk of cost overruns and ensure projects are completed on time and on budget.

Keywords: Cost overruns, Construction contract administration (CCA), Building Information Modeling (BIM)

*Speaker

Improving Project Outcomes by Integration Fast-tracking Technique and Triangle Management through Building Information Modelling (BIM)

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The project management triangle is a fundamental concept that helps project managers effectively navigate trade-offs. Maintaining coordination between these three factors is crucial to delivering a successful project, as if one element changes, such as a budget cut, it will inevitably impact the timeline or scope. Some researchers and project managers extend this model to include other constraints such as quality, risk, and resources, but scope, time, and cost remain the main pillars of project success. Fast tracking, a project management technique that overlaps sequential tasks, must be integrated with triangle management to ensure project success. This paper aims to bring a fundamental change for construction teams by combining fast-tracking techniques with the project management triangle within the Building Information Modeling (BIM) framework. By examining previous outstanding research and case studies as a literature review, this study demonstrates how BIM improves decision-making amidst the triple constraints, leading to improved cost efficiency, on-time delivery, and superior quality. Furthermore, with a proper integrated framework, this approach not only streamlines workflow, but also improves stakeholder communication and risk management, making complex projects more predictable and successful. Challenges and recommendations for implementation are also discussed.

Keywords: Fast, tracking Technique, Triangle Management, Building Information Modelling (BIM), Project Outcomes

*Speaker

In search of indigenous knowledge framework on climate change education in the Vanuatu education system

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Climate change has become the focus of attention in many countries of the world. Education is seen as a pivotal tool not only in bringing climate change issues to the fore of regional and international debates, but also in raising awareness about climate change in schools. In Vanuatu, Climate Change Education (CCE) has been included in the Vanuatu Education System including relevant policies and curriculum documents.
This paper reports on the preliminary findings emanated from a qualitative case study recently carried out in Vanuatu. The purpose of the study was to find out if current official curriculum documents promote climate change concepts congruent to local settings, for example, the indigenous knowledge system, to promote sustainable development. Data was collected via interviews of key education and climate change officers; as well as by reviewing relevant educational documents, including educational policies and curriculum.

Data collected was analyzed through the content analytical tool. The preliminary findings show that the promotion of local climate knowledge in the curriculum is less emphasized. These findings will be articulated in the presentation. The paper then speculates on the best possible indigenous knowledge framework on climate change beyond the curriculum in order to promote climate change education and to ensure sustainable development for the Pacific people.

Keywords: Climate Change Education (CCE), Vanuatu National curriculum, Indigenous knowledge, Sustainable development

*Speaker

Indigenous research methodologies through the humanities: the bridge between natural science and social sciences

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There is no one-size-fix that most organisations in the development space advocate for when implementing policies and changes in developing countries, including Pacific Island Nations (PIN). The global north tends to use their Western scientific research lenses and evidence-based data to understand, analyse, interpret, and make recommendations for change. As such, they impose their worldviews over regional, national and local contexts. Imposed policies don't work if they are developed or generated externally or from above. Policies from above are shaped by notions of "power over" where there is an imbalance of power relations. "Power over" is scientific, technical, and hierarchically structured. It shapes the natural sciences and to a large extent, the social sciences. The time is right to shift the narrative from an all-technocratic discussion to a holistic approach to promoting research; one that is inclusive of the diversity of contexts shaped by different worldviews and life philosophies. This paper advocates for a more inclusive approach to combining natural science and social sciences, with the humanities in-between, as a bridge. It argues for the recognition of Indigenous knowledge, rooted in the humanities and informed by indigenous research methodologies. Examples are drawn from climate change, resource extraction, and gender and leadership to illustrate the need for context specific research that should recognise other Ways of Knowing, Being, and Doing. I will speak on gaps as experienced - the lived experiences of PNG and the Pacific – as 'insider' narratives, worthy of recognition and acknowledgement in research, to add to the knowledge economy.

Keywords: Humanities, Indigenous Research Methodologies, Power Over, Pacific Islands

*Speaker

Influence of Metacognition Activity and Metacognition Awareness on Metacognition Knowledge in students in a Higher Educational Institution in Papua New Guinea

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Metacognition Knowledge is a higher-order thinking that involves active control over the cognitive processes in learning. Higher-order thinking plays a significant role in ethical decision-making, social justice, as well as inequitable education. It improves logical reasoning by fostering evaluative, creative and caring skills in ethical decision-making, allowing for effective assessment of moral dilemmas and empowering individuals through education by equipping students with the necessary skills to challenge injustice in academic institutions and to advocate for social equity. Educational conditions such as pedagogical strategies, and curriculum designs, as well as individual cognitive processes and psychological characteristics, such as beliefs about one's cognitive abilities, are some factors that influence metacognition knowledge. However, there are limited studies that address the influence of metacognition activity and metacognition awareness on metacognition knowledge in students in a higher educational institution, particularly in Papua New Guinea. This study aimed to establish the influence of metacognition activity and metacognition awareness on metacognition knowledge. A correlational quantitative design was employed to fill this gap. Participants were selected from the Bachelor of Nursing and Clinical Nursing students using a simple random probability sampling. A total of 87 participants responded to the 52-item Metacognition Awareness Inventory questionnaire. Both descriptive statistics and multiple regression were used to analyse the data. The result showed a very strong positive and significant correlation between metacognition activity, metacognition awareness, and metacognition knowledge. Metacognition activity was found to be the best predictor of metacognition knowledge. This suggests that students who engage in metacognition activities improve their metacognition awareness and ultimately gain metacognition knowledge. This is because both metacognition activity and instructive ability help predict metacognition knowledge. The result has implications for the development of learning activities for students to focus on developing higher–order thinking. Curriculum development and reviews, therefore, should be well designed, accommodating learning activities that stimulate the need to participate in higher-order thinking. Further studies should be conducted on this topic on a larger sample size, capturing all universities in PNG. Finally, further studies can also be considered on this topic

*Speaker

from a qualitative approach to better understand the students' learning needs.

Keywords: Metacognition, Activity, Awareness, Knowledge, Papua New Guinea

Innovative Technologies for Volcanic Hazard Mitigation in the Pacific Islands

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Volcanic hazards are among the most pressing geological threats to Pacific island nations. The remoteness, rugged terrain, and limited infrastructure of these regions pose significant obstacles to effective and sustainable volcano monitoring. This work presents a multi-technology strategy for volcanic hazard mitigation, emphasizing innovations that can be adapted to the unique challenges of Pacific island environments. Key developments include the deployment of multi-gas analyzers, gas flux measurement techniques, low-cost seismic and infrasound networks, and drone-based systems for LiDAR, visual, and thermal imaging, alongside satellite-based remote sensing platforms. Integrated with cloud-based portals for data management and real-time visualization, these tools can support the development of more agile and coordinated monitoring networks. Field applications demonstrate how the combined use of ground-based and spaceborne technologies can enhance eruption forecasting, early warning systems, and community-level risk reduction. This collaborative, transdisciplinary framework provides a scalable and adaptive model for strengthening volcanic resilience across the Pacific.

Keywords: Pacific volcanoes, Volcano monitoring, Hazards mitigation

*Speaker

Innovative climate change communication and education for vulnerable communities in PNG: A Case Study

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Climate change poses challenges for many Pacific Islands communities and Papua New Guinea is no exception. Many of these vulnerable communities require assistance to better understand the causes and effects of climate change and what they can do at their level to address these. This paper discusses a case study on innovative climate change communication and education for vulnerable communities in PNG. The study was part of a global study on monitoring and evaluating climate communication and education (MECCE) coordinated by the University of Saskatchewan in Canada in collaboration with the UNFCCC. This case study used the experiences of two communities in the central highlands of Papua New Guinea to investigate the impact of climate communication and education strategies used by the Research and Conservation Foundation of PNG, a not-for-profit conservation NGO.
The case study used face to face and focus group interviews to assess the effectiveness of various CCE delivery methods such as face to face meetings and discussions, awareness and skills training, use of publications like posters and getting commitments from communities to take action.

The findings indicated that a combined use of CCE methods is crucial to enhancing climate communication and education efforts and achieve favorable outcomes for the communities. However, the choice of methods and their uses are also context based and need to be designed with the target audiences in mind. In addition, the communities' often struggle to comprehend the changes observed, which were also contradictory to local or indigenous environmental knowledge and practices. These challenges were addressed through comprehensive CCE methods that not only provided theoretical understanding of these situations but also a platform for those who face similar situations to connect with each other and share their experiences. The CCE strategies were also found to be context based and guide target beneficiaries to both, recognize the problems and their causes and concurrently, develop action plans to address these. The implication is that such strategies have a long-term benefit and are sustainable.

Keywords: climate change education, climate education, Climate communication and education

*Speaker

Integrating Digital Technologies and Traditional Knowledge for Safer and More Sustainable Pacific Ports

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Pacific Island ports are the gateways to economic development, trade, and regional connectivity. However, they are increasingly challenged by climate vulnerability, aging infrastructure, and limited regulatory enforcement capacity. This paper explores how the integration of emerging technologies such as digital permit systems, remote Vessel Traffic Services (VTS), and environmental monitoring tools with traditional ecological knowledge can enhance maritime compliance, reduce environmental risks, and build resilience in port operations across the Pacific.
Drawing on case studies from Papua New Guinea's major and minor ports, this research highlights practical innovations in port inspection, digital auditing, and stakeholder awareness strategies that improve regulatory enforcement and sustainability outcomes. It also examines the role of community-based knowledge systems particularly from coastal and fishing communities in informing localized risk management approaches.
This interdisciplinary study proposes a hybrid model for Pacific port governance that balances digital innovation with cultural context. The findings contribute to policy recommendations for port authorities, regional maritime agencies, and development partners seeking to future-proof Pacific ports against evolving environmental and technological challenges.

Keywords: Pacific ports, maritime compliance, digital technologies, traditional knowledge, sustainability, risk management

*Speaker

Integrating Indigenous knowledge for Inclusive Education in curriculum documents for year four to year six levels in Vanuatu education.

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Vanuatu Campus

Abstract

For a country to have a development that is sustainable, it must put in all the resources to promote an education system that has strong policies and beliefs about education. In Vanuatu the discussions pertaining to sustainable development is taking momentum. The literature suggests that for a system to be sustainable, it must be flexible, inclusive, and congruent to local situations.

This paper reports on the findings of a study carried out between 2024 and 2025. The study examined the curriculum documents for Year 4 to Year 6 in the Vanuatu education system. Using a qualitative research approach, curriculum documents including the syllabus, textbooks, the Inclusion Policy, and Teaching manuals were surveyed and analysed using thematic approach.

The findings from this study show that in some aspects of the documents surveyed have some emphasis on indigenous knowledge approaches to inclusive education. Other aspects of the documents surveyed, however, reveal weaknesses in the implementation of inclusive policy. This paper presents these findings and an attempt is also made to outline the best approach to address these weaknesses by suggesting indigenous knowledge strategies which enhance the delivery of Inclusive Education in a Vanuatu classroom. It is important to address the weaknesses identified to provide quality and sustainable education for all students not only in Vanuatu but in Oceania region.

Keywords: Indigenous knowledge, Inclusive Education, Sustainable Development, curriculum documents, Inclusive Policy.

*Speaker

Integrating kapori and photovoice research methods

Witne Dick Bomai * [1]

[1] Witne Dick Bomai – Papua New Guinea

Kapori is a form of storytelling among the Yuri people of Simbu Province of Papua New Guinea. The underlying principles of kapori resonated with tok stori among the people of Solomon Islands or talanoa among the peoples of Fiji, Samoa, Tonga, and New Zealand. In this presentation, I will discuss how kapori was integrated with photovoice, a research method that used photography to document and understand the complexity of community relevant peacebuilding as a response to intra-clan fights and sorcery accusation related violence (SARV) among the Yuri people. Photovoice research method was underpinned by the interface of Indigenous, Participatory Action and Arts-based research approaches that privileged Indigenous Knowledge, relationships, dialogue, and co-creation of knowledge. The research findings suggested that photovoice research method was an empowering process that can be replicated in other social research as well as agency for community relevant peacebuilding in response to intra-clan fights and SARV.

Keywords: Kapori, tok stori, talanoa, intra, clan fight, sorcery accusation related violence

*Speaker

Integration of traditional knowledge in developing solutions for challenges facing the Pacific: Is the law an appropriate tool? Some answers from Vanuatu, Fiji and New Caledonia

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1

[1] UNC – New Caledonia

New Caledonia, Vanuatu and Fiji have a significant ontological diversity. From one territory to another, attempts at ontological interbreeding have been made, creating a clever mix of Western and traditional approaches. Moreover, the perception of the law differs according to the specificities of each territories. What is each approach made of? Are the answers adapted to the issues?
As part of the SPAR-Pacific research project, a survey has been conducted among students in these three territories to assess their perception of the role of law in the preservation of Indigenous knowledge and practices. This contrast raises questions about the relationship between law and traditional knowledge: why do New Caledonian students seem to be less aware than Vanuatuans and Fijian students of the legal tools for the protection of indigenous knowledge? How can we strengthen their appropriation of the law as a lever for adaptation in the face of the risks of cultural loss?
Beyond the texts, we have chosen to opt for a mixed method, combining classical research in law with an empirical method focused on surveys. This contribution will provide first a comparative presentation of each legal system; then we will present the first results as well as the solutions proposed by the students (from SPAR-Pacific project) to make law a vector of resilience for the transmission and preservation of traditional knowledge in the Pacific.

Keywords: Legal system, Traditional knowledge, Comparative approach

*Speaker

Investigating the Impact of Nomophobia on University Students and Motivation for Learning in a Faith-Based Higher Education Institution in Papua New Guinea

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[1], Rachael Tommbe [1], Kepha Pondi [1]

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Introduction: In today's digital dependency world, a rising concern has now emerged globally, over behavioural, and psychological addictions relating to the extreme usage of smartphones particularly among university students. The Phenomenon of nomophobia (NMP), in short of "no mobile-phone phobia," is a present-day disorder categorized by fear, anxiety and uneasiness when there is no access to a smartphone.. This situation has become important as smartphones are now used in the different facets of students' lives which include communication, learning, entertainment, and social acceptance. In the Pacific Island countries like Papua New Guinea (PNG), there is evidence that students are suffering from this disorder where students are heavily depending on smartphones for online learning, social acceptance, entertainment and communication and this trend has grown over the years. Unfortunately, there is a dearth of studies on this phenomenon. Existing research has addressed the psychological effects of nomophobia, such as increased anxiety, tension, poor academic performance, and social isolation. Using the Cognitive theory this study explored the effects of nomophobia on motivation for learning particularly in a Faith Based Higher Education (HEI) Institution in PNG.
Methodology: A mixed-methods research design that involved both qualitative and quantitative designs was used to understand the impact of nomophobia and its effects o motivation for learning in a Faith-Based HEI in PNG. A purposeful sampling was used to identify 7 students from different schools and backgrounds for in-depth interviews and two focused groups comprising 7 students each. The data was recorded and transcribed and analysed thematically. In addition, a sample of 150 students selected randomly responded to a structured questionnaire and the data was analysed using multiple regression in SPSS.

Findings: The themes that emerged from qualitative data indicated that nomophobia affected the students' health; physically, socially, spiritually, and emotionally. It also affected their academic performance and motivation for learning. This was confirmed with the quantitative data.

Conclusion: Alternative offline activities, developing a university internet policy, digital detox programs, and educating students on digital health and nomophobia are recommended. A similar study may be conducted in other universities across the Pacific.

*Speaker

Keywords: Nomophobia, motivation for learning, cognitive impairment, Papua New Guinea.

Investigating the agricultural importance of piggery sludge use under humid lowland tropical agro-climatic conditions in Papua New Guinea

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1

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This research has explored the potential of grain and forage crops to increase feed production using piggery wastes (sludge). The overarching goal of this research is to establish sustainable strategies to generate quality feed and minimize waste released into the environment. To do that, two replicated field trials were conducted to examine four different rates of sludge (0, 2.5, 5, and 10 t/ha), and planted with rice, maize, bean, and signal grass. All the treatments were replicated five times in a randomized complete block design. Rice (Oryza sativa), maize (Zea mays), and beans (Phaseolus vulgaris) were planted using seeds and signal grass (Brachiaria decubens) using tillers. Standard agronomic practices (watering, weeding, and disease control) were maintained for six months until harvest. During harvesting, all the plants were uprooted and placed on a canvas on the ground, and all the above- and below-ground biomass, plant height, and root length were recorded. The biomass was packed into prelabelled paper bags. Soil within the rhizosphere (30 – 60 cm) was collected using a handheld shovel, and approximately 3 kg from each treatment plot was collected in sealable plastic bags. All plant and soil samples were taken to the laboratory for further processing to analyze the contents of the minerals (nutrients and metals) using standard analytical procedures. Data from four replicates of the treatments were used for statistical analysis. The treatment averages of all the parameters were obtained by taking the mean of the four replicates (n=4). Significant differences ($p< 0.05$) between the treatment means of each profile were determined by two-way ANOVA to compare the treatment means. If an interaction between the treatments and profile depths was found, one-way ANOVA with all combinations was performed using Turkey's HSD (honestly significant difference) and pairwise comparisons. The overall results showed that sludge amendment improves essential soil parameters that sustain general soil health, nutrient status, and availability to grains and forages. The improvements in soil nutrient status and availability depended on the amendment rate, and the most significant effects came from the higher amendment rates. The increase in the rate of amendments increased concentrations of metals in the soil and bioavailability to the plants. The soil parameters and nutrients improved biomass production, which depended on the ability of each plant species to tolerate the metals. The nutrient and metal concentrations were higher under the bean plants (dicot) than rice, maize, and signal grass (monocots). Despite that, based on dry matter, biomass production was signal grass > maize > rice > bean. The implications for this research are that piggery sludge uses in agriculture to produce grains and forages are an important alternative to manage soil fertility and increase production while

*Speaker

paying special attention to metal bioavailability concerns.

Keywords: Piggery sludge, humid lowland, agricultural importance, Papua New Guinea

Is there any Impact of Credit Management Practices on Bank Performance in PNG

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Credit Management and Bank Lending practices were the paramount influential activities performed by every bank globally. These activities become major determinant factors for banking performance in commercial banks and private financial institutions in Papua New Guinea (PNG). Most banks have reached unfavourable outcomes due to a lack of effective credit management and lending practices. According to observations from various annual reports of commercial banks, default risk in terms of existing bad debt has resulted from poor credit management and lending practices. The primary objective of this study is to assess the impact of credit management and bank lending practices on the performance of banks. Specifically, the research examined the effects of interest rates, loan amounts, and loan terms on loan repayment by commercial banks in Papua New Guinea (PNG). The target population for this study was all commercial banks in PNG; however, due to the unavailability of publicly accessible annual reports, only four commercial banks were evaluated based on the available information from the financial years 2016 to 2023. Remarkably, the loans and advances section of the report has been evaluated in conjunction with the lending rate for the loan term available on the banks' website. This research adopted a regression model for the data analysis. The study findings showed that loan amount and loan term (lending practices) have a positive significant effect on loan repayment (banking performance). In contrast, interest rates (Credit Management) have a significant adverse effect on banking performance. The overall study highlights the proactive approach to managing credit risk and promoting transparent lending procedures to sustain banking performance. Several recommendations made in this study aim to improve the efficiency of credit management and lending practices, thereby enhancing the performance of banking.

Keywords: Credit Management, Lending Practices, Banking Performance, Interest Rates, Loan Amount, Loan Terms.

*Speaker

Knowledge, Attitudes, and Practices of Students towards E-Learning (Moodle) at the Solomon Islands National University (SINU): A Cross-Sectional Study

Pressly Junior Fafoekona * [1], Nixon Panda *

[1], Relmah Harrington [1], Sira Tauriki [1], Belinda Arufoa [1], Jemimah Odilia Mary Toge [1], Lisa Hunumeme [1]

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Electronic learning (e-learning) platforms like Moodle are essential in modern higher education, improving accessibility and flexibility in learning. At Solomon Islands National University (SINU), Moodle is the primary learning management system. This study aim to assess the knowledge, attitudes, and practices (KAP) of students towards Moodle across five faculties at SINU. A cross-sectional survey was conducted with 357 students using a structured questionnaire administered via Kobo Toolbox. Participants were selected through a Probability Proportional to Size (PPS) sampling method for equitable faculty representation, and data were analysed using SPSS.

The result showed that the majority of respondents were female (55.2%), aged 20–29 years (60.5%), and enrolled in diploma programs (67.2%). While 92.2% of participants reported familiarity with Moodle, only 2.5% had received formal training. Most students (75.6%) learned about Moodle informally through classmates. Over 90% were familiar with basic functions such as uploading assignments and downloading materials. Attitudinally, the majority recognized Moodle as useful (99.4%) and believed it promotes independent learning (96.4%). However, only 36.4% believed the benefits outweighed the challenges, and 66.7% reported limited interaction through the platform. In practice, frequent use of Moodle was reported by 49.0% of students, and 47.1% utilized a broad range of its features. Although 89.4% accessed Moodle via laptops or computers, only half expressed satisfaction with its functionality. No statistically significant differences in KAP were observed across faculties or year levels ($p > 0.05$).

Overall, while students at SINU demonstrate high awareness and generally positive attitudes towards Moodle, actual usage remains moderate which is hindered by limited formal training, unreliable internet connectivity, and insufficient lecturer and student interaction on the platform. To enhance Moodle's effectiveness as a digital learning platform, the study recommend implementing structured training programs, improving ICT infrastructure, and encouraging greater interaction between students and lecturers.

Keywords: Moodle, e, learning, digital learning platforms, student attitudes, Solomon Islands National University (SINU)

*Speaker

L'utilisation des drones pour la surveillance du littoral : une approche innovante au service de la gestion côtière en Océanie

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La surveillance des dynamiques côtières est un enjeu majeur pour la gestion des littoraux, particulièrement en contexte insulaire tropical soumis aux effets du changement climatique. L'utilisation des drones (UAV) s'est imposée ces dernières années comme un outil innovant et complémentaire aux méthodes traditionnelles de suivi du rivage. En permettant l'acquisition rapide de données à très haute résolution spatiale, les drones facilitent la production de modèles numériques de terrain (MNT), d'orthophotographies précises, et de séries temporelles d'évolution du trait de côte. À travers des campagnes régulières de survols, il est possible de mesurer finement les processus d'érosion, d'accrétion ou de submersion. Légers, peu coûteux et adaptables, les drones offrent ainsi une réponse adaptée aux contraintes des territoires insulaires en matière de suivi environnemental. Notre communication s'appuiera sur plusieurs retours d'expérience menés en Nouvelle-Calédonie et au Vanuatu dans le cadre de programmes de recherche sur le suivi et la gestion du littoral. Elle montrera comment l'intégration de données drone permet d'améliorer la compréhension des dynamiques côtières dans un contexte de changement climatique. Ce type d'approche ouvre la voie à un renforcement des capacités locales pour un suivi régulier et autonome des littoraux exposés.

Keywords: drone, littoral, érosion côtière, changement climatique, suivi du trait de côte, Océanie

*Speaker

Learning the Shoreline: A High-Resolution Approach to Reef Island Dynamics

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Pacific atolls are often described as stable in global-scale studies, typically based on long-term shoreline proxies such as vegetation line or morphometrics like planform surface area. While informative, these approaches can obscure short-term, localized coastal dynamics - including changes in island shape and position - that are critical for ecosystem function, cultural practices, and coastal infrastructure resilience.
This study presents a transferable, automated approach to shoreline monitoring using very high-resolution Pléiades imagery and an XGBoost classifier. The method integrates spectral indices and textural features to delineate the outer limit of emerged land including vegetated areas, beaches, man-made surfaces, and beach rock. This shoreline definition supports fine-scale, spatially explicit monitoring of reef island dynamics, even in morphologically complex environments.

Developed and tested on multiple atolls in French Polynesia (Tetiaroa, Hao, and Puka Puka) the model achieves high accuracy (mean Intersection over Union ≈0.99; Mean Absolute Positional Error ≈ 1.6 m) and demonstrates strong performance on both training and unseen sites, validating its spatial transferability. The extracted shorelines reveal subtle but significant island-scale changes in extent, configuration, and spatial position that remain undetected by conventional shoreline proxies and surface metrics.
By enabling high-precision, scalable shoreline monitoring, this method provides a more nuanced understanding of atoll change processes. It supports Pacific efforts to move beyond narratives of passive loss toward frameworks of resilience and adaptation, while providing spatial tools tailored to low-lying island realities.

Keywords: Shoreline Monitoring, Atoll Dynamics, Transfer Learning, Machine Learning, Remote Sensing, Pacific Islands

*Speaker

Leveraging Data Integration using APIs for Enhanced Data Analytics in Papua New Guinea

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Data is the "New Oil". In a fast-evolving technological world where the survival of organizations mostly depends upon technology, data is the catalyst that is driving business optimization, growth and success. Most successful organizations are data driven. They capitalize on the magical spell of data analytics. Data analytics plays a pivotal role in enforcing well informed decisions in strategic marketing and planning, new product development and other shifts that drive business growth and development across various sectors. Unfortunately, in Papua New Guinea (PNG), due to the splintered nature of diverse data systems and the incapability of interoperability poses significant barriers to effectively capitalize on the strengths of data analytics. Due to the involvement of traditional manual processes and the existence of data and systems in silos, the integration of data and advance data analytics remains a major challenge. This research explores the integration capability of Application Programming Interfaces (APIs) and the potential of leveraging it to address these challenges. It involves a mixed methods approach, consolidating qualitative interviews with data science and analytics professionals and quantitative analysis of case studies from both local and international organizations. It assesses the current state of data integration and analytics in PNG, taking into consideration the limitations of traditional and manual processes of data exchange methods. Significant findings have shown that API-driven data integration presents advantages for growth and efficiency. The study does not only reveal and promotes the rich advantages of API, instead it acknowledges and uncover the challenges that are to be attended for a successful implementation. It proposes a practical framework that is workable in PNG context for API adoption in data integration, which includes a customize architectural design for API Integration. The significance of securing APIs and the transmission of data safely between different systems is echoed in the proposed architectural design. The research exposes the transformative potential of APIs in the space of data integration and analytics in PNG. By embracing API-based data integration, diverse organizations can unlock more reliable and timely insights, ultimately supporting data-driven development and policy-making in the country that are based upon reliable data.

Keywords: Data, Analytics, API, Integration, Interoperability, Silos

*Speaker

Living Without Electricity in Urban Communities in PNG: The Case of 8-Mile Settlement

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[2] Crawford School of Public Policy, Australian National University – Australia

This PIURN Conference presentation would highlight the author's recent academic research project that investigated the electricity access challenges in urban communities in PNG and present the latest findings. It will examine urban areas' access issues, focusing on safety, health, education, and economic impacts to inform policy improvements, especially in informal settlements.

Using qualitative methods such as non-random sampling and snow ball technique, the study explores 8-mile settlement residents' electricity access challenges, coping strategies, and implications of off-grid living, revealing limited access reasons often linked to service inadequacies rather than personal choices. It exposes infrastructure and land tenure complexities leading to financial struggles and safety concerns, disrupting daily life and business operations, prompting alternative energy use and increased expenses. Electricity shortages hinder business viability and education, with community efforts and government interventions addressing access gaps but posing safety risks. Land recognition issues exacerbate the problem, hindering utility expansion and individuals' access to essential amenities.

The focus of this presentation is on presenting the findings of this recent research project and highlight the need for further research on related issues like water supply connections in informal urban communities. This is a timely research topic, where the data and analysis will be of interest to policy makers in the electricity and public service delivery space and other respective stakeholders. Overall, comprehensive solutions involving government, infrastructure improvements, and community involvement are needed to address these socio-economic challenges effectively.

Keywords: Electricity access, infrastructure development, land tenure, public utility, off grid living, alternative energy

*Speaker

Low tech vs High tech? What path for agriculture in Oceania's SIEs?

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This work examines the direction that technological progress should take to meet the accelerating pace of global change and the challenges facing humanity. Based on the case of agriculture in the IAPs of the Oceania region, we show that only the adoption of an agroecological model and low-tech innovations based on local ecological knowledge will be able to ensure food security for populations and strengthen their resilience. We conclude with a number of recommendations in terms of public policy and international cooperation.

Keywords: High tech, Low tech, sustainability, agriculture

*Speaker

Machine Learning for Data-Driven Demand Forecasting of TB drugs

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Forecasting demands for tuberculosis (TB) drugs is critical for public health and sustainable development in PNG, where Clinics frequently experience understocking, overstocking and stockouts. This study uses machine-learning approach to forecast or predict a data-driven TB drug demand, aiming to improve medicine availability in Health clinics. More specifically, this research addresses – how can forecasting models predict likelihoods of stockouts or overstocking, and alert decision-makers well in advance? It investigates key critical factors contributing to these issues and how predictive models can support decision-making. Using historical data from TB Clinics in Lae District on drug distribution, consumption and stock levels, the research evaluates and develops forecasting models for accuracy and robustness against external variations like weather, supply, funding, and reporting.
Preliminary results suggest that machine learning methods can significantly reduce stockouts compared to traditional forecasting techniques. The proposed approach will facilitate research and development of machine-learning and case-based reasoning, data science and healthcare.

Keywords: Data, driven Demand Forecasting, Machine Learning, Case, based reasoning, Tuberculosis (TB), Healthcare Supply Chain

*Speaker

Malaria Distribution and Trends in Under-Five Children in Honiara (2018-2024): Strategic Insights and Implications for Malaria Elimination by 2030 in the Solomon Islands

Hugo Bugoro * [1]

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Abstract

Background and Purpose: Children under five, comprising 15% of the Solomon Islands' population, are highly vulnerable to malaria, accounting for 26% of cases in 2016 and 19% in 2019. This study examines malaria distribution and trends among this group in Honiara from 2018 to 2024.

Methodology: A descriptive cross-sectional study was conducted using malaria case records from the Honiara Pikinini Clinic. Data were manually retrieved, processed, and analyzed using Excel 2019 to assess trends over five years.

Results: Malaria affected both genders, though males (55.13%) were slightly more susceptible than females (44.87%). Plasmodium falciparum was responsible for 50.86% of cases. Children from East Honiara were the most affected. A steady annual increase of 3.4 cases was observed, with multiple outbreaks from 2021 to 2023, emphasizing the persistent risk in this age group.
Conclusion and implcations: The findings highlight the ongoing vulnerability of children under five to malaria. The steady rise in cases indicates the need for a robust surveillance and monitoring system to facilitate targeted interventions. The data also reveals a marginally higher susceptibility among males, with *Plasmodium falciparum* being the predominant parasite species. Additionally, the higher incidence in East Honiara calls for geographically focused malaria control efforts. Targeted public health strategies and sustained resource allocation therefore will be key to achieving malaria elimination in Honiara.

Keywords: Malaria in under, five children, Plasmodium falciparum, Seasonal malaria patterns, Honiara, Solomon Islands.

*Speaker

Mataeina'a Systems in Tahiti: Researching Land-Use Practices of the Past for a Regenerative Future

Vehia Wheeler * [1]

[1] Australian National University – Australia

This presentation examines land-use practices in valleys and districts, also called the Mataeina'a systems, in Tahiti (Ma'ohi Nui/French Polynesia). Inspired by the many environmental, social, and climate resilient advantages of the Hawaiian Ahupua'a system, my research examines how Tahitian valleys and districts were managed in the 1800's to inform how we can better improve land-use practices for current times. My methodologies include interviews with farmers, cultural practitioners and archival research to reconstruct the Mataeina'a systems of Tahiti. The research looks at ways these valleys were managed holistically (environmentally, socially and spiritually) and with respect to spatial and temporal elements.

Keywords: Indigenous knowledges, land management, indigenous futures, climate change

*Speaker

Measurements of Cs-137 in Spanish Mackerel (Scomberomorus Commerson) from the marine environment of Milne Bay Province, Papua New Guinea.

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This study is aimed at identifying the artificially produced radioactive isotope Caesium-137 (137Cs) and determining its activity at specific sites across the marine environment of the Milne Bay Province of Papua New Guinea. Representative samples of Scomberomorus commerson (narrow-barred Spanish mackerel), commonly found in coastal and offshore waters in the tropical and subtropical zones was collected from the Spanish mackerel from four different locations within the sea waters of Milne Bay Province in Papua New Guinea. The samples were analyzed using the liquid scintillation counter Multilabel Tester to measure the Cs-137 activity concentration. All fish samples had detectable Cs-137. The highest concentration in the examined species was 0.66 Bq/Kg and 0.54 Bq/Kg is the lowest concentration. These concentrations as investigated are found within Misima Island and Samarai Island, respectively. All activity concentrations were below the derived standard limits of 500Bq/Kg and the doses to human for consumption. It can be concluded from this study that there are areas in the Milne Bay Province marine environment with measurable levels of the artificial radionuclide 137Cs although these levels are generally lower than some published data for other global sites.

Keywords: radioactive isotope Caesium, 137, Scomberomorus Commerson

*Speaker

Mini Taro Cratering Machine- Design Optimisation: This Document Shows the Methods, Software Workflow, and Algorithm to Perform Design Optimisation

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To develop a Mini Taro Cratering Machine, it's vital to have at least a double or triple platform profession. Accelerating the project and reducing costs is what almost every company wants. This project demonstrates the integration of SolidWorks, MATLAB, and Microsoft Excel to optimize a mechanical design through simulation and computational analysis. SolidWorks is the primary platform for creating 3D models and conducting physical simulations under different loading and boundary conditions. The simulation results, including stress, displacement, and other performance data, are then exported to Microsoft Excel for initial data organization and filtering. MATLAB performs advanced computations, data analysis, and graphical representations using Excel as a bridge. By combining the strengths of these three platforms, the project achieves a more flexible and efficient design workflow. SolidWorks allows for detailed modeling and simulation accuracy, Excel simplifies data handling, and MATLAB performs deeper analysis and optimization using mathematical and statistical methods. This approach helps make well-informed design decisions based on simulation outcomes and calculated results. MATLAB further allows for the automation of repetitive calculations and the visualization of trends across different design parameters. The integration improves accuracy, reduces manual errors, and speeds up decision-making. Overall, this method provides a robust system for optimizing design parameters, reducing material waste, and ensuring better performance of the final product.

Keywords: Constraints, Design Optimization, Design Variables, Factor of Safety, Objective Function, Object Oriented Programming, Stiffness.

*Speaker

Modeling and mechanobiology of mitral valve

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In this study, we have used a fluid structure interaction to model the blood flow in mitral valve and its leaflets. Using CT images, we have made a real geomtery of the mitral valve and the Solidworks was used to make the model. The real boundary conditions were used and distolic phase of the heart was modeled for 0.5 seconds. The hyperelastic material properties was used both for the left ventrical and mitral. ANSYS software was used to perform the numerical simulations. The hemodynamic parameters including the blood velocity, pressure, and shear stresses were analyzed. The obtained results were compared to the exisitng literature. The displacements and strain of the left ventricle tissue was also studied.

Keywords: Mitral, simulation, mechanobiology, velocity, pressure, stress, strain

*Speaker

Natural Forest Seed Collection for Banking of Least Explored Tree Species in (Papua) New Guinea

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Papua New Guinea forms the eastern half of New Guinea, known for having the world's richest island flora with 13,634 species and 68% endemic to the island. Our research presents the collection and conservation of seeds on the eastern half of the tropical rainforest in New Guinea, aimed at preserving endemic and endangered species in the rainforest of Papua New Guinea. To date, we have collected 46,792 seeds from 64 tree species (_˜0.46%) sealed in aluminum envelopes and preserved in a conventional refrigerator (-210C) conditions. Most seeds in the forest we studied requires careful examination at species level to for fully understand the germination viability, classifications and resilience to desiccations for more than several months to years under conventional seed storage conditions.

Given the limited understanding of tree species phenology in the rainforest of Papua New Guinea, our target for tree species seed collection is based on random scouting in the forest floor to collect seeds. Enhancing seed bank facilities and research capacity at Bulolo Campus presents a significant opportunity to study seed storage behaviour in New Guinean species and improve phenological data collection, ensuring high-quality seed conservation. In collaboration with the Asia-Pacific Seed Preservation and Research Network (SPARK), research on the phenology and seed storage behaviour of *Nothofagus* species will serve as a foundation for these efforts. Bulolo campus students will be trained under the new bachelor of forest research management to collect and germinate seeds to supporting the university arboretums and further implement forest restoration and management as part of the university visions.

The takeaway from the Australasian Seed Science Conference is to learn as much from other experts in seed science worldwide and to develop a seed research network to conserve some of the least explored seeds on the second largest island on the planet.

Keywords: Seed banking, endemic species, endangered species

*Speaker

Network Automation with Python: A Practical Guide

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Abstract Network automation has become a cornerstone of modern IT infrastructure management due to technological advancements and the explosion of network connected devices. Automation significantly enhances operational efficiency, minimizes human error, and improves scalability and security. Traditional manual network management approaches are increasingly inadequate in the face of dynamic, large-scale, and complex network environments. As organizations seek to optimize operations, ensure rapid deployment, and maintain consistent security postures, automation becomes a necessity rather than a luxury. Python, a versatile and powerful programming language, has emerged as the dominant tool for network automation because of its user-friendly syntax, rich ecosystem of libraries, and adaptability to diverse networking environments. Its broad support for multi-vendor environments, flexibility in developing customized solutions, and strong community resources make it an invaluable asset for network engineers. This paper explores the critical role of Python in network automation, elaborating on its benefits, core libraries, practical implementations, real-world case studies, challenges, and future trends. It also integrates academic insights with real-world applications to provide a comprehensive understanding of the field. By bridging the gap between theory and practice, this work aims to serve both academic audiences and industry professionals, highlighting Python's pivotal role in shaping the future of network management and automation.

Keywords: Network Automation, Python, Netmiko, NAPALM, Paramiko, Ansible, Infrastructure as Code, Intent, Based Networking

*Speaker

Nursing Students' Satisfaction with Community Health Nursing (CHN) program in Higher Education Institution in Papua New Guinea

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[2] Pacific Adventist University – Papua New Guinea

Abstract
Student satisfaction is a key indicator of quality in higher education and serves as an important measure of program effectiveness. In nursing education, understanding students' level of satisfaction provides valuable insights into student experiences, identifies areas for improvement, and informs strategic planning for the universities. This study assessed nursing students' satisfaction with the Community Health Nursing (CHN) program at a higher education institution in Papua New Guinea across four key domains: curriculum, teaching and learning environment, clinical practice, and program duration, to inform improvements in educational quality.

A quantitative descriptive cross-sectional design was employed. Non-probability sampling technique was used to recruit 37 former students who completed the CHN program over the past five years. Data were collected through a structured questionnaire adopted from the Nursing Student Satisfaction Scale (NSSS), utilizing a 5-point Likert scale. The data were analyzed using SPSS Version 22.0.

The result showed high levels of satisfaction with the course content and teaching methodologies, especially the use of multimedia lectures. However, average satisfaction was reported regarding the teaching and learning environment, particularly in relation to library and internet services. Moderate satisfaction was also noted in the area of onsite supervision during clinical attachments, suggesting room for improvement. In contrast, the study duration received high satisfaction, with students expressing appreciation for the one-year program structure.
Overall, the study revealed strong satisfaction with the CHN program, especially in terms of curriculum and duration. However, improvements are needed in learning resources and clinical supervision. The study provides valuable insights for program enhancement and recommends further research on the impact of teaching methods, the relationship between satisfaction and academic performance, and interventions to support student learning outcomes.

Keywords: Keywords: Students Satisfaction, Community Health Nursing, Curriculum, Teaching and Learning Environment

*Speaker

Old technology, new technology: the archive of Ruth and Mack Ruff

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Wallace 'Mack' Ruff, and his wife, Ruth, produced a substantial collection of drawings, photographs and notes on village art and architecture in the Sepik region of Papua New Guinea (PNG). The Ruffs had a long association with the Papua New Guinea University of Technology (PNG UoT), where Mack worked as a researcher, and Ruth worked as his field assistant. The Ruffs worked on the PNG UoT Village Studies Program, which aimed to document the traditional architecture and village layout of PNG's 19 regions. They were prolific in their documentation.
The Ruff Collection comprises around 20,000 photographs, 1500 drawings and substantial fieldnotes. The collection is housed in the Architectural Heritage Centre of PNG; a centre established by Mack in 1994 in the Department of Architecture and Building at PNG UoT. It has been estimated that 95% of the buildings documented by the Ruffs has since disappeared.

The Sepik is famous for its detailed art and architecture, embedded with cultural knowledge. Traditional structures were made from sustainable materials taken from the bush and built to withstand local environmental conditions. Seeing the effects of climate change in this part of the world, it is timely for communities to re-examine these traditional methods. With this in mind, the Ruff Collection should be made more accessible to students of architecture and associated studies in climate resilience, in PNG and in similar environments.
The Pacific Manuscripts Bureau has been making preservation copies of at-risk archives in the Pacific since 1968 and making them more accessible to researchers through a network of libraries. Deveni Temu is the former University Librarian at PNG UoT, where he got to know the Ruffs and their collection. Deveni now works at Pambu, where he and colleague, Kari James, are working with the Ruff family and staff of the Architectural Heritage Centre to promote the collection and make it more accessible to researchers. The generation of people with extensive knowledge of this collection is ageing, so it timely to digitise the collection and make it accessible to students who may find solutions to new challenges in an archive of old technology.

Keywords: Archives, digitisation, architecture, Papua New Guinea

*Speaker

On the impact of exotic naturalized trees in the landscapes of Papua New Guinea -the situation in Bulolo and Wau

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Exotic tree species are tree species that have been introduced into an area outside their normal distribution. Over the years, exotic plants have been introduced in Papua New Guinea (PNG) for aesthetic, agricultural, landscaping, and many other uses. Today, some of these plant species are noticeably dominating the natural ecosystems, particularly the disturbed landscapes, where they are suppressing regeneration of native plant species. This is the trend of species composition expected under the disturbance following from climate change and anthropogenic and natural disasters. Little is known about their rate and extent of their distribution, potential benefits and negative impacts on the environment and the ecosystem as a whole. The natural forests often are not able to rebound from alteration of forests by anthropogenic activities through agricultural farming practices, logging, mining, infrastructural development and settlements, and also natural disasters. The rate and extent of the spread of dominant exotic tree species, namely, *Samanea saman* (Fabaceae), *Albizia chinensis* (Fabaceae), *Leucaena leucocephala* (Fabaceae), *Spathodea campanulate and Piper aducum* (Piperaceae), *Ochroma pyramidale* (Malvaceae) and *Pinus caribaea* (Pinaceae), in and around the vicinity of the townships of Bulolo and Wau were assessed using aerial imagery to demonstrate the actual formation of forest communities by exotic tree species in a PNG landscape. The survey data demonstrated a positive impact that exotic tree species can naturalized well into the landscape ecosystem they thrive in, forming new forest communities. Their spread has had both beneficial and negative impacts on natural landscapes, and community livelihoods.

Keywords: Bulolo, Wau, exotic trees, Papua New Guinea

*Speaker

Organic matter amendment of swidden fields to maximize the yield of sweet potato along an altitudinal gradient in Papua New Guinea

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This study aimed to investigate the use of organic matter in the swidden fields to address the soil fertility problem and increase sweet potato production along the altitudinal gradient in PNG. The experiments were conducted on fallowed fields in three altitudes (700 m, 1700 m, and 2700 m) along the Mt. Wilhelm altitudinal gradient. Organic amendments of coffee pulp and wood ash plus the inorganic NPK fertilizer were applied to improve soil nutrients and other important soil parameters and enhance sweet potato yield. A total of 5 old fallowed fields were selected, and the experimental gardens were set up using a randomized block design. In total, 15 experimental gardens of 8 m x 8 m were established in all three study sites. These gardens were subdivided into four plots (4 m x 4 m), and 25 sweet potato mounds (50 cm x 50 cm x 80 cm) were constructed in the plots. The mounds were treated with coffee pulp (205 g), wood ash (14 g), and NPK fertilizers (25 g), while the control plots received no treatment. The sweet potato mounds were planted with vines of the local sweet potato variety and left to grow. The sweet potato gardens were harvested when ready, and tubers, vines, and leaves were measured as biomass production. Soil samples were randomly collected for nutrient analysis and other soil parameters. One-way ANOVA and Kruskal Wallis tests were performed on the dataset depending on whether the data was parametric or non-parametric. The overall findings revealed that soil organic amendment affected the soil nutrients, but the results were insignificant across all study sites. Suggesting soil nutrients were taken up and used, especially at high altitudes. The yield was significantly increased at the 1700 m and 2700 m elevations. Wood ash amendment and NPK increased biomass production considerably. In addition, only the vines and leaves significantly increased at the 2700 m elevation. Comparatively, sweet potato production was poor in the coffee pulp-amended soils across all study sites. The overall outcome proves wood ash is an effective soil amendment that can enhance sweet potato yield compared to NPK fertilizer.

Keywords: Organic matter, swidden fields, yield, sweet potato, altitudinal gradient, PNG

*Speaker

Overcoming Ethical Issues in Managing Government-Funded Projects in Papua New Guinea

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Abstract

Government-funded projects in Papua New Guinea (PNG) are critical to advancing national development, particularly in key sectors such as infrastructure, healthcare, and education. These projects have the potential to improve the livelihoods of the population, but their successful execution is often hindered by a range of ethical challenges. Among the most prevalent issues are corruption, resource misallocation, weak governance structures, and the influence of cultural norms, all of which severely impact the effectiveness and outcomes of these initiatives (Lal & Turner, 2019).

This research aims to explore the ethical dilemmas faced by project managers in PNG and to propose strategies to mitigate these issues, thereby improving the management of government-funded projects. The study delves into the root causes of these ethical challenges, assesses their impacts on project success and sustainability, and evaluates how governance frameworks can be strengthened. A mixed-methods approach was employed, combining in-depth qualitative interviews with project managers, government officials, and other key stakeholders, alongside quantitative surveys to gather data on the prevalence of these ethical issues and their effects on project outcomes. The findings underscore the need for enhanced governance structures, stronger ethical guidelines, and increased transparency to improve accountability and sustainability in government-funded projects. Ultimately, the research provides actionable recommendations aimed at addressing these ethical challenges and promoting better project management practices, contributing to the long-term development of PNG. Additionally, this study adds to the body of knowledge on project management in developing countries, particularly in the Pacific region.

Keywords: Ethical challenges, government, funded projects, Papua New Guinea, governance, corruption, project management, sustainability

*Speaker

Overcoming the challenges of Papua New Guinea's construction industry through the integration of Building Information Modeling (BIM) and Lean Construction

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[1], Lincoln Sauwa *

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Evidently, the construction industry as a whole is a high-risk, low-profit-margin industry that needs modernization. There are several common and general challenges, including labor shortages, rising material costs, time and cost overruns, communication issues, and safety concerns, that can be prioritized based on the context of the construction industry. Papua New Guinea's urban population is growing rapidly and the construction industry now needs to significantly move towards digital transformation with emerging technologies such as Building Information Modeling (BIM) to bring significant benefits to the industry and achieve project success. Building Information Modeling (BIM) and lean construction, although distinct, are increasingly seen as synergistic approaches to project management and delivery in the architecture, engineering, and construction (AEC) industry. BIM provides a collaborative digital model of a project, while lean construction focuses on minimizing waste and maximizing value through continuous improvement and streamlined processes. The aim of this research paper is to examine how the challenges of the PNG construction industry can be improved through the integration of BIM as part of digitalization and lean construction techniques. This can be developed through a literature review of high-quality publications and followed up with some case studies to create a clear structure for optimizing design, construction and project outcomes by increasing collaboration, reducing errors and improving efficiency. As a result, BIM and Lean Construction are not mutually exclusive, but rather complementary approaches that can be used together to optimize project outcomes. By leveraging the strengths of both, Papua New Guinea's construction industry can achieve better project management, reduced costs, and improved quality.

Keywords: Building Information Modeling (BIM), Lean Construction, PNG construction industry, Digitalization

*Speaker

Ozone Depletion and Climate Change Action in the Pacific

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Ozone Depletion and Climate Change Action in the Pacific

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2PNGUoT; office of the Vice Chancellor

The authors investigated the science of ozone (O3) depletion in the Earth's Stratosphere and the outcome of the mitigation actions of the global community to reverse the damage.

An appraisal of the energy resources in PNG was also carried out to see how renewable energy can play a vital role in Climate Change Mitigation.

This research articulated that shifting PNG's energy reliance from fossil fuels to renewable and environmentally sustainable sources, recommended in the PNG National Energy Policy, is not only achievable, but feasible within the set time-frame;

The authors advocate that all stakeholders in the public and private sectors would need to work together towards this energy goal. The paper argued that nations in the Asia Pacific Region should be prepared to take the lead on global warming and climate change mitigation actions beven if the current US administration or other sceptics (due to political and socio economic reasons) attempt to turn the clock backwards.

Main Author Biography
Dapsy Olatona is a Physics lecturer at PNGUoT; He completed his PhD studies at UNSW in Sydney in Quantum Nano Physics. He conducts research in all areas of Renewable Energy. He is a licensed electromechanical fitter with over 30 years Industrial experience. He participates actively in the reclamation of ozone depletion substances.

Keywords: PNGUoT, SERI, Ozone Depletion, Earths Stratosphere, Climate Change Mitigation, Renewable Green Energy Sources.

*Speaker

Pacific short stories on traditional agriculture to the sustainable development in the Pacific

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The Pacific Islands face growing challenges related to food security, climate change, and modernization, threatening traditional agricultural knowledge and practices. While scientific and technological solutions are crucial, the role of literature - particularly short stories - in preserving and transmitting indigenous knowledge remains largely unexplored. This research examines how Pacific short stories depict traditional food crops, farming techniques, and the cultural significance of agriculture, providing valuable insights into sustainability and resilience within island societies.

Drawing on narratives from both Anglophone and Francophone Pacific authors such as Wendt, A. (1976), Hau'ofa, E. (1993), Kurtovitch, N. (2000), Gorodé, D. (2005), and Kurtovitch, N. (2011), Tavo, P. (2015), this study highlights how literature preserves oral traditions, documents indigenous farming practices, and reflects the evolving relationship between Pacific communities and their environment. These stories emphasize the importance of food sovereignty, seasonal cycles, and the spiritual and communal dimensions of agriculture. They also reveal tensions between modernization and the preservation of traditional agricultural systems, Nabobo-Baba, U. (2006) and Campbell, J.R. (2015).

Through a literary and ethnographic analysis, this study argues that storytelling serves not only as a means of cultural preservation but also as a potential tool for education and policymaking. Integrating literary narratives into discussions on sustainable agricultural development helps bridge the gap between traditional knowledge and technological innovations, ensuring a more holistic approach to food security in the Pacific. This study aligns with the PIURN 2025 theme by emphasizing how cultural narratives can complement and enrich technological advancements for sustainable development tailored to the realities of the Pacific Islands.

Keywords: Pacific literature, short stories, traditional agriculture, food security, indigenous knowledge, sustainability, cultural preservation.

*Speaker

Parametric Analysis and Iterative Engineering Blueprints for Low-Cost Sago Bark Processing Machine

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As Papua New Guinea is moving into the next step of civilization we diligently cling onto our traditional sources of food still to this day, one of which is the Sago palm, evidently still the staple food of the nation in many remote parts, thus it would be a tremendous boost in the production rate of local Sago farmers if one can locally produce and mill sago with reduced human effort and time, the traditional methods of extracting sago starch is very tedious, time and energy consuming, it. As engineers and innovators, we have the responsibility to reduce all that input effort required from a human, and replacing it with a machine. The Design and Fabrication of Low-Cost Sago Bark Processing Machine paves the way for making this a reality. However, the biggest question to be asked yet is: "is this even theoretically possible?" Papua New Guinea imports 98% of the 400,000 kg of rice, the primary staple food of the country that citizens consume. Creating machines such as the mentioned can potentially reduce the percentage of imported energy foods as rural farmers can finally be equipped with the desired low cost, locally made machinery for small scale farming practices. As a result of no such initiative at present, subsistence farmers have to rely on commercial companies to process their harvest, and for sago, we still resort to the traditional methods our ancestors used centuries ago. To address this issue, a Parametric Analysis has been conducted to investigate the possibility of Creating a fully functional Sago Bark Processing Machine, according to the theoretical calculations and parameters found Iterative Engineering Blueprints of a possible prototype of the machine were made considering the availability of materials for future Manufacturing Possibilities. The small machine consists of: an engine which is the actuator , The bark is grinded off the entire tree that is felled using a grinding wheel and finally pulley systems that turns the mixing shaft into a housing filled with grinded sago bark and water mixture which is then separated into starch and fibre using a straining mechanism

Keywords: Blueprint, parametric, sago.

*Speaker

Perception of Religious Leaders on the Preamble and Section 45(1) of the PNG Constitution

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This study examines how Christians and non-Christians perceive the Constitution's Preamble and Section 45(1) regarding religious rights. It explores whether the Preamble contradicts or supports Section 45(1). The study also identifies constitutional issues that might conflict with religious practices. The study utilized an interpretivism paradigm and a mixed-method research approach to collect and interpret data. Insights were gathered from thirty-five religious leaders across three highland provinces of PNG: Jiwaka, Simbu, and Eastern Highlands. The findings indicated that the Preamble, which declares PNG as a Christian country, conflicts with Section 45(1) of the PNG Constitution, which guarantees freedom of religion, along with rights related to race, color, sex, gender, and place of origin. The study recommend legislative and policy reforms on constitutional and religious affairs. The constitutional reforms include revising the Preamble for inclusivity by promoting shared values such as love, forgiveness, righteousness, and peacemaking; implementing guided democracy; enforcing accountability for politicians; and reviewing gender equality policies. The proposed reforms for religious affairs include developing a national policy, organizing inter-denominational forums, registering religious groups, and screening leaders to ensure adherence to moral standards, all aimed at promoting inclusivity and moral integrity in PNG.

Keywords: Universal Declaration of Human Rights, Constitution, Constitutional Founders, Noble Tradition, National Goals and Directive Principles, Religion, Traditional Religion, Religious Principles, Christian Principles, Religious Practices, Religious Beliefs

*Speaker

Perceptions of Health Extension Officer students in Divine Word University on medical simulation training as a preparation tool for clinical placement: A mixed methods study

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Medical simulation training is an increasingly vital educational strategy for preparing healthcare professionals to meet the complex demands of clinical environments. This mixed-methods study explores the perceptions of Health Extension Officer (HEO) students at Divine Word University (DWU) regarding the effectiveness of simulation training in preparing for clinical placement. The study aligns with Papua New Guinea's (PNG's) commitment to building a competent healthcare workforce and reflects the Pacific region's broader goal of harnessing innovative technologies to improve healthcare delivery and support sustainable development.
A sequential explanatory research design was employed, involving a survey of 101 students from three academic years, followed by focus group discussions (FGDs) with 24 participants. The survey assessed satisfaction, skill development, and resource adequacy, while FGDs explored deeper insights into the integration of basic medical sciences, development of clinical and interpersonal skills, and student-driven recommendations for improving simulation training.

Findings indicated that students generally viewed simulation training as highly effective in enhancing clinical competencies, including technical proficiency, decision-making, and teamwork, all within a safe and supportive environment. Structured feedback and opportunities for hands-on practice were particularly valued. Nevertheless, participants highlighted several areas for improvement, including longer training sessions, stronger integration of basic science knowledge, and greater consistency in instructor training.

This study highlights the transformative potential of simulation-based learning in strengthening healthcare education in PNG. Enhanced investment in simulation technologies and improved teaching methodologies can significantly advance the readiness of health workers to serve in rural and underserved areas, thereby contributing to safer and more equitable health outcomes. The findings offer relevant insights not only for DWU and PNG, but also for other Pacific nations facing similar workforce and resource constraints, where context-appropriate innovations are critical.
In conclusion, integrating simulation training into healthcare curricula supports national and regional efforts to build a resilient, skilled workforce and foster safe, sustainable healthcare development across the Pacific.

*Speaker

Keywords: medical simulation training, healthcare education, innovative teaching, divine word university

Perceptions of Undergraduate students on critical reading: A case study

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Critical reading is an essential academic skill that is encouraged in any tertiary institution. It is directly linked to critical thinking that develops students' deeper understanding and effective problem solving. However, it has been observed that current university students lack critical reading skills that lead to low-content responses to assignments, unpreparedness for discussions, and lack of motivation in reading texts that are directly related to their learning. Students also seem to lack the quest and curiosity for learning and depend on teacher directed instruction. There are limited studies that address critical reading among university students with multilingual background particularly in the Pacific Islands. Using transactional theory of reading this study explored the perceptions, challenges and strategies for improving critical reading. A qualitative case study was used to understand this phenomenon. A purposeful sampling with maximum variation was utilized to identify 14 undergraduate students from various regions of Papua New Guinea. In-depth interviews were conducted and the data transcribed, coded and thematically analysed. Findings revealed that students perceived critical reading as focused reading and textual analysis for understanding. The lack of critical reading was attributed to attitudes towards reading, length of assigned reading texts, and inadequate guidance. Guided practice, change of attitude towards reading, and support are recommended for improving critical reading. Improved critical reading may heighten students' comprehension, writing and problem-solving abilities in both academic and future employment contexts. Further studies should include action research to implement the strategies identified.

Keywords: Critical reading, critical thinking, guided practice, multilingual background

*Speaker

Physics-Based Technologies for Climate Action and Sustainable Development: Local Solutions for the Pacific

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Pacific Island nations face acute threats from climate change, including rising sea levels, extreme weather events and dependence on imported fossil fuels. These challenges demand urgent, science informed strategies that are both locally relevant and sustainable. This research project explores how the principles and applications of physics can contribute to climate resilience and sustainable development in the Pacific.
Examining core Physics concepts such as the greenhouse effect, Earth's energy balance and ocean-atmosphere thermodynamics and their role in understanding regional climate impacts is vitally important. Localized climate data that includes sea-level rise and temperature trends are used to contextualize the challenges faced in the Pacific, whilst confronting risks associated with climate change.

Locally collected data and analysis reinforced these risks. Environmental measurements from meteorological offices and performance testing of solar photovoltaic panels under varying conditions shows inefficiencies. Energy consumption surveys inform the design of a proposed wind nano-grid system, and community surveys on perceptions of climate change and sustainable practices further complement this analysis.

Case studies from Tuvalu, Fiji, and the Solomon Islands showcase successful applications of Physics-based renewable energy technologies, including solar PV systems and wind energy feasibility studies. These examples highlight how Physics based modeling is used to size, optimize and implement clean energy systems suited to island contexts.

Community engagement and capacity building are addressed through educational programs linking Physics to climate action, citizen science initiatives for local data collection and examples of science based policy integration at the local level.
By identifying major barriers including limited funding, infrastructure and technical expertise, while proposing actionable opportunities such as regional collaboration, skills training and investment in local innovation, it is possible to mitigate the challenges associated with climate change in an ever changing socioeconomic development. The outcomes demonstrate the practical value of Physics in addressing climate challenges and calls for its broader integration into Pacific development strategies.

Keywords: Climate Change, Sustainable Development, Pacific Islands, Physics Based Technologies, Renewable Energy, Citizen Science

*Speaker

Plate Configuration Deduced from Earthquake Mechanism and Crustal Deformation around Sagami Bay

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The plate configuration around the Kanto-Tokai region has traditionally been interpreted using either seismic data or crustal deformation. Seismicity-based models consider the Izu Peninsula as part of the Philippine Sea Plate (PHS), whereas crustal deformation models identify it as part of the Izu Microplate (IM). This study integrates both seismic and deformation data to analyze plate configuration around Sagami Bay, focusing on the IM. Hypocenter distribution along the eastern boundary of the IM reveals a slab-like structure dipping eastward at about 45◦ from the Izu Peninsula toward the Pacific Plate (PAC), making contact at depths of 60–90 km. High seismic velocity zones align with this structure, supporting the interpretation that it represents the IM slab.

The IM slab extends from southern Sagami Bay to northern Kanto, thinning in the south and thickening with double seismic zones in the north. Beneath Sagami Bay and the southern Boso Peninsula, the IM slab appears to stack atop the westward-dipping PAC slab. East of Miyake Island, the southern IM slab seems to be torn into eastern and western segments. Further, the slab east of the Izu Peninsula is overlaid by the subducting Izu forearc (IA) beneath the North American Plate along the Sagami Trough. While the IA appears to terminate near Tokyo, the IM slab continues northward. The IA's thickness (10–20 km) is comparable to the southern IM slab, suggesting the IM may have once been part of the IA before being overridden.

To investigate IM–PAC interaction, slip vectors of earthquakes ($M > 3.0$) near their contact were analyzed and compared with relative plate motions. Results showed large angular differences between slip vectors and relative motions, regardless of whether IM or PHS was assumed, suggesting seismicity is influenced more by regional stress than direct plate interaction. The study concludes the IM slab exists beneath Sagami Bay to northern Kanto, though its full extent remains uncertain. Further research is necessary, particularly regarding its western and northern boundaries and its interaction with the PAC slab

Keywords: Izu Microplate, plate configuration, Earthquake mechanism, crustal deformation, earthquake hypocenter, earthquake slip vector

*Speaker

Post-Harvest Handling Practices, Market Accessibility, and Economic Impacts on Coastal Communities in Lau Lagoon, Malaita Province, Solomon Islands.

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Fish post-harvesting processes, market access, and the economic value derived from fisheries are pivotal to the livelihoods of coastal communities in the Solomon Islands. As a nation dependent on marine resources, fishing sustains both food security and income generation for many households. This paper explores the interconnection between post-harvesting practices, market accessibility, and the resultant economic impacts on coastal populations.
Post-harvesting processes, including proper handling, preservation, and processing, are critical in maintaining fish quality and reducing post-harvest losses. Traditional methods such as smoking, drying, and salting are widely practiced, often supplemented by limited modern techniques like freezing. However, inadequate infrastructure, such as cold storage facilities and transportation networks, remains a significant challenge, leading to reduced product value and marketability.

Market access is another critical factor influencing the economic outcomes of fishers. The geographic isolation of many coastal communities hinders access to urban and international markets. Small-scale fishers primarily rely on local markets or intermediaries, often receiving lower prices for their catch due to limited bargaining power. Enhancing connectivity and supporting cooperative marketing models could improve market efficiency and empower fishers economically.

The economic value derived from fisheries is vital for household income, community development, and national revenue. Artisanal fishing contributes significantly to the subsistence and cash economy of the Solomon Islands. However, this value is undermined by post-harvest losses, fluctuating market demand, and the lack of value-added processing opportunities. Integrating modern technologies, capacity-building programs, and sustainable fisheries management practices can enhance economic returns and promote resilience among coastal communities.

This study underscores the need for strategic interventions to strengthen post-harvest systems, expand market access, and maximize the economic value of fisheries, thereby improving the livelihoods and long-term well-being of coastal people in the Solomon Islands.

Keywords: Postharvest Handling, Postharvest Losses, Livelihood, Lau Lagoon, Processing, Preservation, Market Access, Fishers

*Speaker

Preliminary Results on Development of Sustainable and Biodegradable Food Packaging Films Using the Peels of Indigenous Banana Plant Musa ingens from Enga Province of Papua New Guinea

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"Sustainability" and "Plastic/polymer pollution" are probably the two challenging phrases that the world is currently facing and the scientific investigations are focusing on. While mitigating plastic pollution has become a humongous task, sustainability has always come in handy with vastly spread biodiversity. Papua New Guinea (PNG) is one such blessed country with a hugely diversified bioresources. Food industry is one massive area that contributes to pollution, mostly through food packaging and single-use plastics. Of many known banana varieties in PNG, *Musa ingens* is special as it holds the record of being the world's largest banana tree, and they are widely found at elevation limits between 1000-2100 m. Based on recent research published, this study was undertaken, however, with raw banana peels instead of ripened ones, to check if the fruit-ripening factor plays a significant role in preparing biofilms, and further if raw peels result in films with superior properties. The study indicated that raw peels were also able to produce biodegradable films. Preliminary results are encouraging and the films were able to be prepared, stretched as well as biodegraded within a definite timescale. The study indicated that some vital factors for putting these films into food packaging applications like water solubility (_˜21-47%, lower the better), moisture content (_˜16-35%, lower the better) and stretchability/elongation (_˜3-12%, higher the better) are still challenges to overcome. A discussion on subtle modifications done to the laboratory procedures and various results obtained will be presented. Further, a comparison of properties of films obtained from the present study with those of ripened peels reported in the literature will also be presented in the paper.

Keywords: Banana peels, Musa ingens, packaging films, biodegradable films, plastic pollution, sustainability

*Speaker

Promoting Cross-disciplinary Education in the Pacific using Sports

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Abstract:
The Pacific region faces many urgent challenges with health, climate change and sustainable practices being at the forefront. To address these, cross-disciplinary expertise must be encouraged, and a comprehensive holistic approach to education must be fostered. The word 'holistic' carries particular significance as the key driver is our Pacific People, who will become the instruments to tackle these challenges. Thus, they must be able to step into these spaces. It makes sense to consider sports, not just a standalone discipline for fitness and health, but a tool to combat all three challenges. Sports uniquely raises an individual's opportunities and awareness in our often disadvantaged societies, disposes of cultural, gender and social differences, brings down language barriers, and establishes cooperation and friendship. Sports can help deliver education, training, and support at all levels across many disciplines, existing commitments and goals. This paper presents sports as a powerful tool to deliver SDGs in the Pacific context, in both non-formal and formal education.

- **SDG 3 (Good Health and Well-being):**

Regular physical activity is crucial for mental and physical health, and sports promote healthy lifestyles and combat NCDs. NCDs produce a huge carbon footprint and hence combatting NCDs has a role in combatting climate change.

- **SDG 4 (Quality Education):**

Sport can be a tool for education, promoting values like teamwork, fairness, and sportsmanship. Sports have a role to play in education on Sustainability, Climate Change and Health.

- **SDG 5 (Gender Equality):**

Sport promotes gender equality through equal opportunities for participation and leadership.

*Speaker

- **SDG 13 (Climate Action):**

The complex, bi-directional relationship between sports and climate action is investigated and necessitates a collaborative, cross-disciplinary approach. Furthermore, sport can raise climate change awareness.

- **SDG 16 (Peace, Justice, and Strong Institutions):**

Sport promotes peace, justice, and social inclusion by involving people from different backgrounds and abilities.

- **SDG 17 (Partnerships for the Goals):**

Collaboration between governments, sports organizations, and other stakeholders is essential for achieving sustainable socio-economic development through sport. Homegrown athletes/role-models inspire younger generations to be active and work in various sports-related disciplines. Thus, Pacific Islanders will develop a sense of ownership of their sports.

Keywords: Sports, Pacific Islands, Education, SDGs

Psychological impacts of gender-based violence against women in hula community

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This paper examines the issue of Gender-based violence (GBV) as a serious problem that affects women psychologically in Papua New Guinea (PNG). These effects include hindering freedom of movement and community participation by women. The ultimate aim is to develop an understanding of such negative effects on women and girls, as a case study that was conducted in Hula village of Central Province, PNG. The purpose of the study was to identify the main forms of violence against women in the community, the possible causes and their psychological consequences, identify and recommend strategies to reduce and prevent these captioned issues. The research involved 20 key informant interviews with community leaders and three focus groups within a small group of men and women including the teachers from an elementary school in the village. The main findings from the study highlights the psychological effects of gender-based violence committed against women, either single or married. The major contributing factors of gender-based violence identified are: lack of food and money, and, alcohol consumption, and misuse of social media. These contributing factors have extensively contributed to gender-based violence having greater impacts on women's mental health and impacts on perpetrators. Consequently, the women are unable to participate fairly in social activities. The study is important as it highlighted the proportion of GBV prevalence at the community level.

Keywords: Psychological violence, psychological effects and social media

*Speaker

Public Servant's Perception of the Auditor Generals Office in Reducing Financial Fraud in the National Capital District of PNG

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Abstract

Introduction - Financial fraud is a global issue, and is driven by pressure, opportunity, and rationalization, and persists globally. Individuals may commit fraud due to financial or family pressures, available opportunities, or by justifying their actions through perceived entitlement or the belief that it is common. Given this, financial fraud has led to a lot of problems today, causing huge losses to businesses, career losses and damaged reputation, loss of public trust, and Economic Instability. It hinders progress in developing countries like Papua New Guinea. The Auditor General's Office is crucial for good governance, but its effectiveness in the public sector is doubted. Using fraud triangle theory this study sought to determine the significant differences in fraud reduction based on demographic characteristics, assess the relationship between Auditors attributes, Management support, Internal control and financial fraud reduction and identify factors that contribute to the reduction of financial fraud.

Methodology - A cross-sectional survey was conducted among public servants from nine government departments in the National Capital District. Convenient sampling was used and a total of 139 responses were obtained. Data was collected through self-administered questionnaires and statistically analyzed using SPSS.

Results - Analysis of various (ANOVA) showed that there were no significant differences in fraud reduction responses based on demographics. Pearson's correlation showed a significant positive relationship between auditor attributes, management support, and internal control with financial fraud reduction, and multiple regression showed that Auditor's attributes emerged as the strongest predictor of fraud reduction ($r = .381$, $p > .001$).

Recommendations - The study recommends that the auditor attributes such as competency, skepticism, integrity, due professional care and ethics should enhanced as a mechanism of fraud detection and reduction. Further study should identify additional factors that would effectively reduce financial fraud in Papua New Guinea since fraud remains a complex issue.
Keywords: Financial, Fraud, Auditor General, Public Sector, Papua New Guinea

Keywords: Financial, Fraud, Auditor General, Public Sector, Papua New Guinea

*Speaker

Renewable Resources for Sustainable Power Generation: Green Synthesis of Zinc Oxide for Dye-Sensitized Solar Cells

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The production of green energy represents a major challenge in the thematic of global climate change. Electricity production by photovoltaic solar cells is currently widely studied to develop low-cost devices such as Grätzel dye-sensitive solar cells or peroxide solar cells in improve their performance compared to the classic silicon cell.
The Grätzel dye-sensitive solar cells are made up of a dye, a semi-conductor as zinc, titanium or nickel oxide and an electrolyte solution. The dye can produce electrons when excited by light, the electrons are captured by the semiconductor oxide and passed to the electrical circuit to which the cell is connected. The electron is regenerated bye an electrolyte as iodide solution in the main case. The production of semi-conductor oxide or dye with a lower cost and the efficiency of dye or the capacity of the semi-conductor are still current challenge.

In his study, we investigate the preparation of zinc oxide by classic sol gel process and green chemistry in natural organic media.

The sol gel synthesis is carried out by polyol process or by classic precipitation in basic media followed by a step of calcination à 600 ∘c. We study the doping of zinc oxide with nickel or cobalt ions in order to modify the band gap of the zinc oxide-based semiconductor to improve its electron capture capacity. The particle size is controlled by modifying the synthesis parameters (metal ion/base ratio). Zinc oxide particle are characterized by X-ray diffraction transmission electron microscopy and UV-visible spectroscopy .
The synthesis of zinc oxide particles by green chemistry is achieved by reduction of a zinc cation by a reducing natural products and calcination at 600∘C. The influence of several natural extracts from organic waste biomass (green and black tea, cocoa, coffee) on the synthesis yields and properties of zinc oxide particles was evaluated. Untargeted metabolomics approaches based on mass spectrometry were employed to identify the molecular structures involved in the green synthesis process.

Keywords: Dye sensitive solar cell, ZnO nano particles synthesis, Green chemistry

*Speaker

Repositioning the PNG University of Technology for National Impact: The Role of Higher Education in Advancing Livelihoods through Science, Technology, and Policy in Papua New Guinea

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This paper argues that in the 21st century, the relevance and success of the Papua New Guinea University of Technology (PNGUoT) must be measured not only by academic outputs but by its tangible impact on societal well-being. Drawing parallels from global best practices and the Times Higher Education Impact Rankings, the paper positions PNGUoT as central, not only to deliver its programs, benchmarked to international or accredited industry standards but also to ensure that its research is applied in practice through policy formulation achieving Sustainable Development Goals (SDGs) in the country. Grounded in the motto "standards of higher education is synonymous with higher standards of living," this study explores how PNGUoT can act as a driver for national development. It calls for systemic reforms in PNG's education and research ecosystem to enable solution-driven engagement with communities and policymakers.

Keywords: PNG University of Technology, Societal well, being, Accredited Industry Standards, Sustainable Development Goals SDG.

*Speaker

Research Report on Operational Challenges and Technological Integration at UPNG Open College: Insights from the 2024 Half-Yearly Report

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This study evaluates the effectiveness and challenges of student support services and the integration of Technology-Enabled Learning (TEL) at the University of Papua New Guinea (UPNG) Open College. The study draws on both qualitative and quantitative data, including survey, staff interviews, and institutional reports collected during the 2024 academic year. The research evaluates the operational challenges and institutional readiness across five regional centres (Buka, Kokopo, Madang, National Capital District, and Mt. Hagen) and thirteen additional Open and Distance Learning (ODL) centres throughout Papua New Guinea. The findings reveal persistent systemic challenges, including limited financial resources, inadequate infrastructure, staff shortages, and communication inefficiencies that collectively undermine the delivery of timely academic support and digital services. Students reported frequent delays in receiving academic materials, restricted access to ICT tools, and insufficient engagement from academic support personnel. Despite these constraints, both staff and students demonstrate a strong willingness to adopt digital learning tools when adequate training and infrastructure are available. Technology-Enabled Learning is identified as a transformative strategy for expanding educational access and improving learning quality. However, its uneven implementation reflects broader disparities in digital literacy and institutional capacity. The study recommends a series of strategic interventions, including increased investment in ICT infrastructure, enhanced staff development programs, diversified funding mechanisms, and the establishment of more responsive academic support systems. These recommendations aim to assist policymakers, institutional leaders, and educators in enhancing the delivery, equity, and impact of Open and Distance Learning (ODL) in Papua New Guinea, emphasizing the transformative role of technology in education. By leveraging technological advancements, ODL can increase access to quality education, address geographical and infrastructural challenges, and offer flexible learning options to meet diverse student needs. Integrating technology is key to improving educational outcomes, fostering inclusive environments, and ensuring that all learners, regardless of their location or background, benefit from innovative educational solutions.

*Speaker

Keywords: Technology, Enabled Learning (TEL), Open and Distance Learning (ODL), Student Support Services, Institutional Readiness

STEM teacher education: Challenges in the Post-graduate Diploma in Education program in training STEM teachers for Secondary and High Schools in Papua New Guinea

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Shifts in society's contemporary progress continues to impact the provision of education in this century. Papua New Guinea schools system is required to adopt these shifts in curriculum, teaching and learning. An important shift is that of Science, technology, engineering and mathematics or STEM. STEM education has gained momentum in many countries and PNG is embracing this shift. In doing so, challenges such adequate resourcing, identifying schools teacher training have emerged. The University of Goroka, as the premier secondary teacher education university has taken important steps in facilitating teacher education program in STEM education. The targeted group of 'trainees' for this program are applicants who have undergraduate qualifications in STEM. These students are trained through its Post-graduate Diploma in Teaching (PGDE). These students are recruited to teach STEM-related subjects in the secondary schools. This program has its fair share of challenges in teacher training needs, lecturer and program suitability and resourcing. This paper presents the findings of a Queensland University of Technology-UoG research that highlights the challenges relative to the STEM aspect of the PGDE program and related activities at UoG. Adequate institutional capacity building, STEM resourcing and affected schools and teachers' challenges reflect the need to consolidate STEM education in the country.

Keywords: STEM, PGDE, education, teachers, teaching, learning, challenges, resources

*Speaker

Science Technology Engineering and Mathematics (STEM) Education: A report on how students at the primary school engage in STEM education lessons

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STEM stands for Science Technology Engineering and Mathematics. It is a method of education where in the subjects are taught in coherence instead of in isolation. This research report investigates the strategies used in teaching STEM education lessons and the impacts it has on students. STEM education is a subject which focuses on actions that lifts foundational skills in STEM learning areas, and develops mathematical, scientific and technological literacy for students involved. It also promotes the development of the 21st century skills of problem solving, critical analysis and creative thinking. This case study is inspired by reasons that STEM is being studied as separate subjects in Papua New Guinean (PNG) schools. Also, it is yet to be formally incorporated to PNG's education system and curriculum. This case study used Arts Based Research (ABR) during data collection because ABR is a creative research approach which enables researchers to gather data through observation, interviews and/or questionnaires and analysis of first-hand information from participants. The findings indicate that students' critical thinking and problem solving skills are enhanced through STEM education because of the hands on approach and the practical pedagogy involved in facilitating STEM lessons using lego sets from suppliers like the young engineers in Australia.

Keywords: Science technology engineering mathematics, critical thinking, technological literacy, creative thinking, lego, pedagogy, arts based research, inquiry based learning

*Speaker

Settling and rheological properties of dilute and concentrated suspended particulate matter from contrasted soils of New Caledonia

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New Caledonian (NC) Soil presents a wide diversity. The most famous soils are developed at the expense of the rock covering about 1/3 of the main island surface: peridotites. The meteoric weathering of peridotites leads to the formation of lateritic soils, enriched in Fe and other metals but poor in Si, that are currently mined for Ni extraction. However, the other 2/3 are covered by other types of soils including acrisol, that generally developed over NC sedimentary rocks, enriched in Si and hosting a clay-rich horizon, and vertisol, smectite-rich and organic-rich soils that are ubiquistous from NC valley bottoms. Suspended particulate matter (SPM) results from soil erosion during storm or important raining episodes. SPM concentration can be high in ultramafic watersheds impacted by the mining industry. Once in water, it can aggregate and settle by various mechanisms that are highly dependent on the salinity and physico-chemical conditions. The aim of this work was to study the settling mechanism and dynamics (settling speed *vs.* aggregate size) of contratsed SPM in order to improve the sizing of settling ponds used to prevent pollution downstream mining areas. To do so, we characterized by X-ray diffraction and transmission electron microscopy the mineralogcial characteristics of SPM from acrisol, vertisol and lateritic soils and we monitored by laser optical absorption under different salinity concentrations their settling behavior. The results showed a specific behavior for SPM from Vertisol due to their high content in organic matter that favored particles aggregation and thus increased the rate of sedimentation. In parallel, the rheological properties of Acrisol were studied by varying the mineral composition of the soil and the particle size class of the clay particles. Those experiments provided us with the yield stress (fluidification threshold) and the rheological behavior of these soils upon water saturation. These latter results can help to better anticipate possible environmental damage and increased health risk after heavy rainy events.

Keywords: settling mineral suspended particules, aggregate, rheological properties of soil, water treatement

*Speaker

Smart and Integrated Techniques for Climate-Resilient Road Infrastructure Planning and Management in Papua New Guinea

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In Papua New Guinea (PNG), the mountainous regions face significant challenges in road infrastructure planning and management due to rugged terrain, climatic variability, and frequent natural disasters. These challenges exacerbate the vulnerability of road networks to climate change, requiring innovative solutions to ensure their sustainability and resilience. This research explores the integration of smart and advanced techniques, including Geospatial Information Systems (GIS), Remote Sensing (RS), and Civil Engineering technologies, interactive web application to enhance road infrastructure planning, management, and monitoring in these regions.
The study emphasizes the use of high-resolution spatial data and real-time monitoring systems to optimize road network design, reduce maintenance costs, and improve response strategies to extreme weather events such as landslides, floods, and cyclones. By integrating geospatial data with climate models and civil works technologies, the research aims to develop a framework for climate-resilient road infrastructure that can adapt to both current and future climatic conditions.

The approach is focused on providing decision-makers with tools that support the planning of resilient road corridors, considering factors such as slope stability, erosion risks, rainfall patterns, and flood zones. The application of GIS and remote sensing enables the identification of vulnerable areas, allowing for targeted interventions and cost-effective solutions. Furthermore, the use of climate projection models ensures that infrastructure is designed to withstand future climatic shifts, fostering long-term sustainability.
Ultimately, this research aims to contribute to the development of a robust, climate-resilient road infrastructure network in PNG's mountainous regions. It proposes a methodology that integrates both local knowledge and advanced technologies, fostering sustainable development while ensuring the safety and connectivity of remote communities. By applying these integrated techniques, the research seeks to provide an actionable framework for improving infrastructure resilience in the face of climate change and natural hazards.

Keywords: Climate Resilience, Road Infrastructure, Geospatial Technologies, Sustainable Development

*Speaker

Social Impacts of Climate Change on the Coastal Communities- Case Study: Togoru Village, Fiji

Kunal Gounder * [1]

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The global threat of climate change poses a significant risk to the coastal communities as they are the frontliners to many impacts associated with climate change. Rising sea levels, increased intensity and frequency of natural hazards and coastal erosion is causing forced migration of coastal communities around the globe, leading to many social problems like cultural loss, psychological issues and social cohesion. Due to sea level rise, salt water intrusion is a major problem causing failure of agricultural production, leading to other problem such as food insecurity and malnutrition. Salt water intrusion has also affected to the water table, resulting to drinking water contaminated and unsafe for consumption. Coastal communities in the small island developing states are more social vulnerable to impacts of climate change as they have limited resources for adaptation and limited government budget for support. The residents of the Togoru community are attached to their land despite being faced with the catastrophic impacts of climate change, such as sea level rise, coastal erosion, saltwater intrusion, salinisation and coastal pollution (India, 2023) (Yee et al., 2022). According to (Yee et al., 2022), the residents of Togoru have opted to adapt to in-situ adaptation, i.e., the practice of adaptation by putting in measures to reduce the impacts or damage rather than relocation.

Keywords: Climate Change, Coastal communities, sea level rise, global threat, saltwater intrusion

*Speaker

Spatial Analysis of Agricultural Health and Drought Conditions using Multispectral Satellite Image

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Multispectral satellite images acquired through remote sensing can identify, estimate, monitor, and manage the ecological environment, agricultural health, drought, and agricultural production. This study compares the drought monitoring system using two commonly utilized indexes: the vegetation health index (VHI) and the temperature vegetation dryness index (TDVI). An oil palm plantation site owned by New Britain Palm Oil Limited (NBPOL) near Erap station, located on the northern bank of the Markam River in the Morobe Province of Papua New Guinea, is selected for this study. The Operational Land Imager and thermal infrared sensors of the Landsat 8 satellite provide the global community with 11 multispectral bands. This data (from March 2024) was downloaded from an open-source platform. Three spectral bands- red, near-infrared, and thermal- generate the normalized differential vegetation index (NDVI) and land surface temperature (LST) databases, respectively, which are significant parameters for generating the Vegetation Condition Index (VCI) and Temperature Condition Index (TCI). Furthermore, these VCI and TCI indexes were utilized in the VHI and TDVI models. The VHI output varied from 11.83 to 87.78, while the TDVI value ranged from 0.142 to 0.969. VHI and TVDI have been categorized into five intensity levels: (i) normal conditions, (ii) mild drought conditions, (iii) moderate drought conditions, (iv) severe drought conditions, and (v) extreme drought conditions. Lower VHI values and higher TDVI values are classified as extreme drought conditions. A strong coefficient of determination was calculated between LST and VHI (R^2 = 0.89) and NDVI and VHI (R^2 = 0.88), indicating that NDVI and LST are equally influential factors in assessing vegetation health. Conversely, a perfect correlation was calculated between LST and TDVI (R^2 = 0.98), compared to NDVI and TDVI (R^2 = 0.48). The findings revealed that VHI produces more efficient and spatially detailed results than TDVI. This research can identify vegetation health and drought conditions for other crops in different regions. Establishing an AI-integrated satellite-based drought model, which includes high-resolution multispectral satellite data, micro-scale satellite-based precipitation data, and soil moisture data, is recommended, as it will improve accuracy and enhance prediction certainty.

Keywords: Agricultural drought, remote sensing, vegetation health, vegetation index, surface temperature

*Speaker

Spatial and Temporal Wave Climate Variability and Trends in Fiji: Insight from Four Decades of Hindcast Data

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Wind-generated ocean waves have significant impacts on coastal areas in the Pacific Islands. Therefore, the knowledge of wave climate is essential for efficient coastal management and planning. This study investigates the wave climate of Fiji using high-resolution multi-decadal hindcast data derived from the unstructured version of the wave model Simulating Waves Nearshore (SWAN). The model was developed, validated against altimetry and buoy records, and then executed for 44 years (1979-2023). Our analysis explores the mean annual and seasonal wave conditions, interannual variability driven by large-scale climate patterns, and long-term trends. Fiji's wave climate is characterised by multi-modal sea states, driven by the combination of wind seas generated by the prevailing trade winds and long-period swells generated by the mid-latitude storms of the Southern Ocean, both systems strengthening during the austral winter. Wave severity in Fiji exhibits a clear spatial gradient, with larger waves in the south and milder conditions in the north. Spectral analysis confirms the four distinct wave sources dominating Fiji's wave climate, namely, the extratropical storms in the northern Pacific and southern Pacific, the southeast trade winds, and episodic tropical cyclones. The Southwest Pacific is strongly influenced by large-scale climate variability patterns such as El Niño. Here we explore these teleconnections by looking at the correlation of the wave spectra with the most important climate indices modulating wave climate in the Pacific, which are the Oceanic Niño Index (ONI), Pacific Decadal Oscillation (PDO), and Arctic and Antarctic Oscillation (AAO). Long-term analysis reveals statistically significant upward trends in the significant wave height offshore of the Fiji Islands. Similarly, trends in the peak wave period were found significant only in deep offshore waters, where the influence of landmasses that tend to mask such trends is minimal. These findings are in agreement with previous studies that relate the observed trends to an increase in the mean and high-frequency wave height extremes during the austral winter. This study of Fiji's wave climate builds on prior research to better understand the impacts of waves on Fiji's coastlines and offer critical insights for future coastal risk assessments and adaptation strategies.

Keywords: Wave climate, hindcast, Fiji, SWAN, climate indices, spectral, trends, waves, wind seas, swell, storms, tradewinds

*Speaker

Strategies for Pacific Islands Sports in the run-up to the 2032 Olympic and Paralympic Games

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Exposure to high level competition is a major challenge for Pacific Islands Sports. Some sports have competed on an international stage, producing mixed results. Most have a considerable performance gap between grassroots, recreational and representation athletes. Observably and anecdotally reported, often what may be considered as child, young adult, or lower-level sub-elite athletes have been inappropriately or prematurely selected to representative teams, and who have subsequently been unable to adequately compete at higher representative performance levels. With such inconsistencies in selective processes and performance gaps, it is imperative that selection and developmental processes be improved, and a better understanding what is an 'elite athlete' be defined and understood across the Pacific Island Sport context.

This paper explores the definition of 'talent' and reviews research literature on talent detection (TAD), identification (TID), talent development (TDE) and talent selection (TSE), with reference and application to the Pacific context. It aims to help inform Pacific coaches of these concepts, address highlighted problems, and help better prepare Pacific Island sports, and their athletes, for the international stage. Considerations are provided for designing and implementing more robust athlete development pathways and strategies for Sports in Pacific Island countries, as they prepare for the 2032 Olympic Games in Brisbane.

Current Pacific programmes predominantly focus on TAD, which is considered only an initial step in a more comprehensive Talent Development system. A comprehensive system is recommended to include TAD, TID, TDE, and TSE, and needs to recognise the iterative approaches from TID, through TDE to TSE. Any programme or system is recommended to facilitate talent transfer to optimise the Pacific country's athletic talent pool. It is imperative to review and expand these programmes by educating relevant high-performance staff and stakeholders on what skill competencies and capacities should be subjective or objectively searched for in TAD, verified in TID, and then purposefully nurtured in TDE. These steps will ensure a more robust, credible, system is implemented, with justifications for athlete progression at appropriate stages, potentially helping yield more competitive elite-level athletes.

Keywords: Pacific Sports, Talent Development, Sports Development Strategy, Elite Athlete, Brisbane 2032

*Speaker

Strengthening Animal and Wildlife Health Systems in Papua New Guinea: A Collaborative Approach for Biosecurity and One Health in the Australia-PNG Context

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Papua New Guinea's animal and wildlife populations represent critical economic, social, and cultural resources for local communities. Despite their importance, the country faces significant challenges in animal health capacity, including inadequate veterinary services, limited surveillance systems, and insufficient diagnostic infrastructure. This paper examines the current state of animal and wildlife health systems in PNG and proposes strategic approaches for capacity development through a collaborative Australia-PNG framework. Four key capacity-building domains are identified: (1) addressing the critical shortage of trained personnel through innovative training models and community-based approaches; (2) enhancing disease surveillance and reporting systems through participatory frameworks and digital technologies; (3) strengthening diagnostic capabilities through resource optimization and laboratory networks; and (4) fostering cross-sectoral and transboundary collaboration. The Australia-PNG relationship offers unique opportunities for mutual benefit in biosecurity and disease prevention, particularly given the countries' close geographical proximity and shared ecological boundaries. Implementation of these capacity-building strategies would significantly strengthen PNG's resilience against emerging infectious diseases of animal origin, enhance food security, support sustainable livelihoods, and contribute to regional biosecurity efforts in the Pacific region.

Keywords: animal health systems, capacity building, One Health, biosecurity, wildlife disease surveillance, PNG, Australia collaboration, transboundary disease management

*Speaker

Strengthening the systems through the WASH Five Year Plan: A study on comprehensive understanding of the challenges, opportunities, and strategies for strengthening WASH systems in the districts of Papua New Guinea

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This study explores the challenges, opportunities, and strategies for strengthening Water, Sanitation, and Hygiene systems in the districts of Papua New Guinea (PNG) through the implementation of a comprehensive Five-Year Plan. PNG faces significant WASH-related challenges, including inadequate infrastructure, limited access to clean water, poor sanitation facilities, and high rates of waterborne diseases, particularly in rural and remote areas. These challenges are compounded by geographical, economic, and socio-cultural factors that hinder the effective delivery of WASH services.
Through an extensive review of existing WASH systems, interviews with local stakeholders, and field assessments, this study provides a detailed analysis of the current state of WASH services in various districts of PNG. It identifies key barriers such as insufficient funding, lack of trained personnel, and challenges in community engagement, all of which contribute to the limited sustainability and effectiveness of existing WASH systems. The study also highlights the potential opportunities for improvement, including the use of innovative technologies, enhanced local capacity building, and better coordination among government agencies, NGOs, and community groups.

The research proposes a set of targeted strategies under the Five-Year Plan that aim to address these systemic challenges. These strategies include strengthening institutional frameworks, improving water supply and sanitation infrastructure, enhancing hygiene education, and fostering public-private partnerships for sustainable resource mobilization. By focusing on integrated, community-centered approaches, the study emphasizes the need for long-term commitment to WASH improvements, with an emphasis on sustainability, equity, and resilience.
The study contributes to the broader understanding of how comprehensive, context-specific strategies can be effectively employed to strengthen WASH systems in Papua New Guinea, thereby improving health outcomes and fostering socio-economic development at the district level.

Keywords: Water and Sanitation, Hygiene, Five, Year Plan, Systems, Strengthening, challenges, opportunities, strategies

*Speaker

Teachers' content knowledge, teaching methods and their encouragements that influence Grade 10 students' mathematics results in Port Moresby, Papua New Guinea

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Teachers' content knowledge, teaching methods and their encouragement to students are important as they determine the students' mathematics performance at secondary schools in Papua New Guinea (PNG). However, it is evident that significant number of students cannot continue to Grade 11, and simultaneously decline in student enrolment in science related degrees at the university level in PNG. That being the case, this study aims to examine teachers' content knowledge, teaching methods and their encouragement that influence Grade 10 students' mathematics results. A qualitative research approach (interview) is applied in this study. The interview data of nineteen Grade 10 mathematics teachers were analysed through thematic approach to capture rich information. This study highlights that teachers' content knowledge, teaching methods and their encouragement of students have a significant influence on Grade 10 students' mathematics learning. The study concludes that more attention should be given to these three factors at schools, in order to improve Grade 10 students' mathematics learning.

Keywords: Content knowledge, teaching methods, encouragement, mathematics and learning

*Speaker

Technology Innovation for Active lives: insights from adolescents from New Caledonia and Australia

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INTRODUCTION: Societies in New Caledonia and Australia are facing complex challenges where lifestyle and the environment are deeply interconnected, contributing to the high prevalence of non-communicable diseases (NCDs). Adolescents are at heightened risk of NCDs due to increasingly sedentary lifestyles and insufficient physical activity. While digital technology offers opportunities to promote physical activity, existing technologies and online platforms have not been designed with and for adolescents. Adolescents have unique health needs and priorities compared with adults, making it more crucial than ever to recognise these distinctions and develop a digital environment tailored to their special requirements.
OBJECTIVES: Gain insight into adolescents' perspectives on the future of digital technology to promote physical activity.

METHODOLOGY: Participants were recruited using purposive sampling, with outreach conducted through professional connections via email to schools in Australia and New Caledonia. A two-hour workshop was conducted to collect qualitative data through a scenario-based workbook in which participants were tasked to propose a digital technology innovation promoting physical activity. Working in groups, students answered via text or drawings and audio recorded descriptions. A method was developed to summarise drawings into explicit text that was then thematically analysed.

RESULTS: There were 146 participants from New Caledonia and 66 from Australia. Half of the proposed solutions were inspired by existing technologies with the other half offering new ideas. The descriptions of inventions were coded into 3 main themes: design, features and type. Australian participants focused more on describing features of the proposed solutions while New Caledonian participants provided information equally across the three themes. The inventions primarily focused on wearable devices, particularly those capable of offering personalised user experiences, the ability to measure exercise-related health data, providing motivation, and having a multifunctional design.
CONCLUSIONS: The majority of designs proposed by participants incorporated unique features, signalling that existing technologies are insufficient in meeting their needs for promoting physical activity. Key themes were identified as priorities for digital technology aimed at adolescents in terms of promoting physical activity. Further research on other age demographics and countries is required to see if adolescent perceptions are consistent.

*Speaker

Keywords: Digital health technology, lifestyles, children

The Changing Role of Women in the Agriculture Sector, and their Contribution to Climate Change Adaptation - A Case Study from Fiji

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Fiji's agricultural industry is vulnerable and continues to be negatively impacted by climate change. As a result, it is urgently necessary to start to take mitigation and adaptation action in the agriculture sector. Women have contributed significantly towards Fiji's agri-business. Historically, there has been under appreciation of women's contribution, complications, and struggles associated with climate change and agriculture. Women's traditional agricultural expertise and traditions are helping us adjust to these changes, but women frequently don't have as much of a grasp on resources, technology, or decision-making processes as men do. Women's capacity to take an active role in and profit from initiatives to adapt to climate change is further limited by social conventions based on gender and cultural barriers. By addressing the changing role of women in agriculture and supporting the claims with facts and figures from field research, one can draw attention to the gender gaps in the workforce. Understanding how women's roles in agriculture are evolving and how they are impacted by climate change is the main goal of this research as women have essential traditional knowledge, capabilities, and practices related to climate-smart farming methods and natural resource management. This work adds to the known knowledge regarding the gender implications of agriculture and climate change Fijian communities. It will offer vital insights to guide the creation of policies and programs that better support women's roles and empower them as important change agents in constructing climate-resilient agriculture by elevating the experiences and perspectives of Fijian women farmers.

Keywords: Climate Change, Agriculture, Gender Roles, Adaptation, FVRF

*Speaker

The Internet Penetration Challenges in Smaller Island States

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This paper attempts to investigate the internet penetration challenges in the Smaller Island States (SIS). The objectives were to investigate the determinants of internet penetration and its role in development and digital divide. It also aimed to explore the implications for SIS, with particular emphasis on Vanuatu.
Engaging Transformative Philosophical Worldview calls for a qualitative research approach with document analysis as the research method. Scanning relevant literatures, Economy-Policy-Infrastructure-Content (EPIC) was identified as the theoretical framework underpinning this study. EPIC positioned political growth, democracy, social transformation, economic growth, entrepreneurship, innovation, content, and technological infrastructure as the major findings of the paper-hence were used to articulate the challenges encountered in the SIS. The paper concluded that the internet penetration challenges require a stable political will with efficient and effective regulatory regime to cultivate an entrepreneurial ecosystem for internet-related startups in Vanuatu. It also suggested that, the regulatory quality, efficacy, and other abilities to create a good independent and transparent governance of internet are pivotal in internet diffusion.

The study acknowledged the presence of 'digital divide' despite recent internet development. These challenges identified are characterised by intertwined factors that are both politically and economically motivated. Internet has a role to play in contemporary societies by increasing interconnectedness and enhancing immense opportunities for entrepreneurship and civic engagement. Building an open and transparent market would enable SIS to advance their development aspirations.

Keywords: Social transformation, entrepremeurship, innovation

*Speaker

The Role of Aquatic Foods Distribution Channel Actors in the Solomon Islands: A Honiara Central Market (HCM) Reflection

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[2]

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The importance of aquatic foods at the global level cannot be discounted, particularly in developing countries. Over 800 million people rely on aquatic foods for livelihood and food security, and provide 3.3 billion people their micro-nutritional requirements (Berkström and Eriksson 2023), specifically vitamins, minerals and omega-3 long-chain polyunsaturated fatty acids essential for normal bodily functions (Golden et al., 2021). Despite these significance, people in developing countries, including those of the Pacific Islands Countries (PICs), are often deprived of these benefits. This paper presents a qualitative reflection of the Solomon Islands National University's (SINU) students (2019-2024 cohorts) interactions with the Honiara Central Market's aquatic food distribution channel actors, as part of fulfilling an academic assessment in the Seafood Distribution and Marketing Unit. Structured interview questions were employed by the students to acquire insights from the aquatic foods distribution channel actors on the subject, whilst using observations and photography as means to capture associated evidence. The key outcomes from the students' work are; common aquatic food forms (products) of mangrove clam, mangrove propagule, mud crab, and sea grapes; evidence of applied indigenous and local knowledge on aquatic food forms; roles of channel actors; and critical factors affecting the channel actors and vital aspects of the aquatic food forms. This paper contributes to expose the key critical areas that require appropriate interventions by relevant government and non-government authorities to safeguard the importance of aquatic foods and the wellbeing of Solomon Islanders.

Keywords: Aquatic Foods Form, Channel Actors, Indigenous Knowledge, Critical Areas

*Speaker

The Role of Faith-based Organizations on the prevention of Cardiovascular Diseases in Solomon Islands: A Qualitative Study

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Abstract

Overview

Cardiovascular diseases (CVDs) are the leading cause of death worldwide, severely affecting low- and middle-income countries such as the Solomon Islands. This study investigates the potential role of faith-based organizations (FBOs), particularly Christian Churches, in preventing CVDs, through the perspectives of health academics. It addresses how these organizations might contribute to CVD prevention in a setting where healthcare infrastructure and socio-economic limitations intensify the public health challenge of CVDs. Despite the significant presence of Christian Churches in Solomon Islands communities, their influence on health behaviours and CVD prevention strategies has not been thoroughly examined.

Research Aim & Objectives

The aim of this research is to understand the role of FBOs on CVD prevention in Solomon Islands. In doing this, the study hopes to contribute to improved community-based health interventions of CVDs in Solomon Islands. The study has four main objectives: (1) to investigate health academics' perceptions of FBOs' influence on lifestyle choices, (2) to assess views on the effectiveness of current CVD prevention strategies, (3) to explore the perceived role of FBOs in enhancing CVD prevention efforts, and (4) to examine strategies for integrating FBOs into public health initiatives.

Method

An exploratory, qualitative approach guided by grounded theory within a constructivist paradigm was employed. Thematic analysis was conducted on eight interviews with experienced practicing health professionals from the Solomon Islands National University (SINU)'s Faculty of Nursing, Medicine, and Health Sciences (FNMHS). Data collection involved open-ended, one-to-one, face-to-face interviews, with analysis performed using NVivo-12 software and Framework Analysis.

Key Findings & Summary

This study demonstrates the crucial role of FBOs, particularly Christian churches, play in CVDs prevention in the Solomon Islands. It highlights the potential of strategic partnerships to overcome resource limitations, the effectiveness of church-based health education in reaching remote areas, and the influential role of church leaders in promoting culturally relevant health interventions. By integrating health initiatives with religious practices, particularly those of the Seventh-Day Adventist Church, the study advocates for enhanced community engagement and health outcomes, while also acknowledging the challenges posed by cultural and socio-economic barriers to widespread adherence.

*Speaker

Keywords: Cardiovascular Diseases (CVDs), Faith Based Organizations (FBOs), Christian Churches, Prevention Strategies, Health Academics, Community Based Interventions, Public Health Initiatives

The Way of the Spear (Makaravi) as an Indigenous Cultural Framework for Community Development in Post-conflict Bougainville: Promoting Holistic and Sustainable Development

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In the pursuit of sustainable development for Pacific communities, the integration of Indigenous knowledge, skills and values with development advancement is essential. As part of a Marsden- funded project investigating change in the Pacific, beyond climate change, and ways in which Indigenous communities demonstrate resilience, this qualitative study explores Indigenous community understandings of societal changes, and depictions of resilience and adaptation for 'gutpela sindaun' in post-conflict Bougainville. The study introduces the 'Way of the Spear' as a culturally grounded framework that promotes a holistic and inclusive approach to community development in post-conflict Bougainville. The framework merges Indigenous knowledge and social cohesion to strengthen community resilience serving as a metaphor for community strength and adaptive capacity. Drawing on insights from arts-based research methods, within an indigenous Melanesian research framework, the research aims to demonstrate how the 'spear' symbolically embodies peacebuilding, community reconstruction, and relationality- elements fundamental to promoting sustainable development that respects local contexts. The study argues that integrating culturally informed frameworks into development initiatives encourages community ownership and prompts western-centrism development models to respect and align with Indigenous cultural norms to promote comprehensive social, environmental, and economic dimensions. By positioning cultural symbols as guiding principles, the study emphasises that development efforts grounded in indigenous worldviews can be more resilient, ethical and sustainable. This approach empowers Indigenous communities to align their development aspirations with Indigenous ways of doing and fairly participate. Ultimately, this study advocates for rethinking development approaches for communities in the Pacific at a time of shifting global economics towards culturally informed development models that prioritise Indigenous perspectives, and advance resilience and sustainability across Pacific communities amid ongoing societal changes.

Keywords: Indigenous knowledge, cultural frameworks, sustainable community development, development model

*Speaker

The history of India and its relation with Pacific Islands

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The history of India along with an insight on prehistoric elements related to Indian history and its relation with the pacific Island has been investigated and presented with documentary and other proofs in logically acceptable mode. Some of the unknown or little known facts about the relation among the societies of indo-pacific region have also been dissected in a research mode to shed light on grey area of historical relations. The significance of these relations in the art, literature, history, religion, culture and society from ancient time to the contemporary one is revealed. The indo-pacific region is important to fight against climate change, disasters; to balance the world powers in economy and militia. The richness of Indo-pacific region and its importance in historic, prehistoric and modern times have been catered in a systematic manner to bring out the importance in the region and their cultures for safe and sustainable development of the whole world.

Keywords: India, Pacific Island, Militia, Climate change, Sustainability

*Speaker

The opportunities and challenges of using electronic monitoring (EM) on seabird bycatch in longline fisheries

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Taiwan, as a prominent nation in longline fishing, faces a critical challenge of seabird bycatch in the fishery industry, which poses a global threat to some seabird populations. In this era of rapid
technological advancements, electronic monitoring (EM) systems emerge as a promising solution to monitor and address this critical issue. The first objective of this study is to review the current
opportunities and challenges associated with using EM for seabird bycatch montioring. We analyzed scientific papers, working reports, and documents from electronic monitoring working groups (EMWGs) under intergovernmental organizations (RFMOs and ACAP). Within this context, the second objective was to discuss more specifically the insights from EM experts and longline observers. The findings reveal four key benefits of EM: a) veryfying bycatch data, b) enabling effective software analysis, c) monitor and record various data with one installation, and
d) high-cost efficient. These results suggest that EM is a good candidate for full bycatch documentation. However, concerns exist regarding potential job impacts on observers, particularly
in foreign longline vessels. In Taiwan's tuna longline fishery, where seabird bycatch mitigation measures are required to used, EM implementation has a high potential to also monitor the use and
effectiveness of those measures. In conclusion, EM as a monitoring tool embodies various strengths that outweigh its weaknesses. With the further development of AI analysis and integration with existing monitoring programs, EM has the potential to become a powerful tool for
future fisheries monitoring.

Keywords: bycatch, seabirds, longline fisheries, electronic monitoring (EM) system, observers, mitigation measures

*Speaker

The roles of cogon grass biochar application on sandy loam soil chemistry and sweet potato tissue composition of nutrients under humid lowland tropical agroclimatic conditions in Papua New Guinea

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Climate change is expected to affect important environmental and climatic factors that affect agricultural productivity and there is a need to understand how agricultural productivity can be sustained under an altered climate using emerging technologies. This study was conducted to assess the changes in soil chemistry induced by cogon grass material biochar application in sandy loam soil and resultant tissue accumulation of nutrients by sweet potato. The results showed biochar amendment of the soil significantly increased the macro- and micronutrient contents and improved soil parameters that affect soil nutrient availability and general soil health. The improved soil health and fertility significantly improved the tissue accumulation of both the macro- and micronutrients, important for general consumption and wellbeing (livestock and human). The changes in soil and tissue composition of the nutrients measured were dependent on the content of the source of the biochar, suggesting different sources would induce different types of changes in soil chemistry and tissue composition.

Keywords: Cogon grass, biochar, sandy loam soil, soil chemistry, sweet potato

*Speaker

The roles of organic matter of varying nutrient content use as amendment in composted mounds on sweet potato tissue accumulation of micronutrients

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Abstract

Sweet potato is the staple of the central highlands and many parts of the lowlands in PNG. One major problem with sweet potato consumption is micronutrient deficiency and its associated health implications. The micronutrients obtained for good health depend entirely on the soil types, soil nutrient management, and production practices. In the central highlands, sweet potato is produced mainly in composted mounds and in flat beds, which is rare. The principle practice in composted mounds used for sweet potato production is that a heap of organic matter (amendment) is covered with topsoil, and vines are planted around the top end. In this study, a trial using organic matter of varying nutrient content in composted mounds was conducted in the central highlands (Laiagam, Pilikimbi LLG Ward #2, Enga Province) to understand the roles of organic matter in tissue accumulation of micronutrients in sweet potatoes. Fern leaf and cogon grass plant materials (locally available) were collected from the study site, prepared as required and used as organic matter. The first treatment was the control mound without amendment and planted, the second was cogon grass amended and planted, the third was fern amended and planted, and the fourth was a combined cogon grass and fern leaf amended and planted. All the treatment mounds were replicated four times and set up in a complete randomized block design under field conditions. Soil and plant tissue (vines and tuber) were sampled after six and twelve months, and replicated plant tissue samples from each treatment were analysed for the contents of seven micronutrients. The treatment average was taken by taking the mean of the treatment replicates. Significant differences ($p < 0.05$) between treatment means were determined by twoway ANOVA to compare the treatment means. The results showed that the accumulation of micronutrients depends on the type of organic matter used as an amendment and the age of the tissues at harvest, which has health implications for the general uses of sweet potatoes.

Keywords: Sweet potato, organic matter, compost mound, micronutrients

*Speaker

The transition of secondary students into higher tertiary education: the perspectives of Divine Word University, Madang province, Papua New Guinea.

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1,2

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This paper provides an overview of students transitioning from secondary school to higher education institutions and their experiences with contemporary learning. This study explored the challenges and barriers students encounter when transitioning into tertiary education at Divine Word University (DWU) and identified available support services to aid in student development.
This study employed an interpretivist philosophy thus, qualitative methodology was used. Data was collected using one- on- one interview with semi- structured questions. Data was analyzed using thematic analysis.

The results indicated that students faced multiple challenges, particularly when moving from secondary education. Key challenges expressed by DWU students are, getting nervous and anxious, leaving parents behind and becoming independent, mismanagement of time, excessive social media use, limited digital literacy, and difficulty in adapting to the online system at DWU. Additionally, adapting to the environment was a significant challenge, which lead to students losing government scholarships, being distracted from studies, and experiencing peer pressures. However, the support services offered by DWU Student Services, such as counselling, psychoeducation and peer mentoring programs, weekend sports, and Information, Communication and Technology services were there to help students adapt to the tertiary education system. Hence, it is significant for students to utilize the services available to overcome the challenges expressed. The findings highlight the importance of early engagement with students and the proactive use of available support services to facilitate their transition into higher education. Thus, enhancing orientation programs, increasing digital literacy support, and promoting greater awareness of the offered support services are vital areas for improvement to empower students in their learning.

Keywords: Students, Transition, DWU

*Speaker

The values conveyed by the junior secondary school mathematics textbooks: Towards rethinking mathematics education in the Pacific.

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Vanuatu gained her political independence from France and Britain in 1980. Since independence the Vanuatu education system opted to continue using the system of education that was introduced by its colonial powers. The system of education recognized mathematics as an important subject to be taught in junior secondary school. Junior secondary schools include year level seven (7), eight (8), nine (9) and ten (10).
In recent times mathematics education in Vanuatu has come under the spotlight for the poor performance of Ni-Vanuatu children in school mathematics. Ni-Vanuatu children perform better in other school subjects than mathematics. This poor performance is likely to hinder any attempts to sustain development in the Pacific.

While many Ni-Vanuatu scholars and educators have made several attempts to determine the contributing factors to this poor performance in school mathematics, this study investigated the types of values being conveyed by the junior secondary school mathematics textbooks and to determine if these values are congruent with the local cultural values and beliefs.
Twelve junior school mathematics textbooks were surveyed and analyzed by semantic content analysis. The overall results show the heavy emphasis on mathematical values that depicts control, rationalism, and power. The minimal emphasis of values that are congruent with the local cultural values is critical in the overall discussion on poor performance in school mathematics in Vanuatu. This paper presents the findings of this study. The paper also proposes an indigenous framework for rethinking mathematics education by harnessing local values and beliefs that could pave the way for a sustainable future for the Pacific.

Keywords: mathematics education, mathematical values, indigenous framework, cultural values, rationalism, power, cultural beliefs

*Speaker

Topic: Exploring the role of traditional culture in promoting sustainable development in Sinisbai, Western Highlands Province, Papua New Guinea

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The purpose of this study was to examine cultural changes within the Sinsibai community. A qualitative research approach was employed, using in-depth semi-structured interviews to gather the views of community members. Both focus group and one-on-one interviews were conducted, and purposive and snowball sampling techniques were used. Data were analyzed thematically. The findings revealed that the traditional culture of the people in Sinsibai, located in the Western Highlands Province, has experienced significant changes. While many positive cultural practices have been preserved, some traditions that were no longer beneficial to the community have been discarded. Notably, the introduction of Christianity and education has led to the cessation of tribal fighting in the village, contributing to over 70 years of peace. This has created opportunities for business, education, and agricultural development.
A key strength of Sinsibai is its strong community leadership, with most conflicts being resolved by community leaders rather than relying on the police. However, despite the positive cultural changes, challenges remain in the community, particularly with the consumption of marijuana and alcohol by a small number of individuals.

Keywords: Culture, Cultural Change, Christinity, Sinsibai, modernisation

*Speaker

Towards Hybrid Learning Models: Merging Indigenous Knowledge and Digital Technologies in Pacific Environmental Education

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This opinion paper explores the compelling potential of hybrid learning models in Pacific environmental education, advocating for a synergistic approach that effectively integrates Indigenous Knowledge (IK) systems with the capabilities of digital technologies. The Pacific region, characterized by its rich cultural heritage, diverse ecosystems, and heightened vulnerability to climate change impacts, presents a unique context for educational innovation. Traditional educational approaches, often heavily reliant on Western-centric curricula and pedagogical methods, have demonstrably failed to adequately address the specific environmental challenges faced by Pacific Island nations and communities, nor have they effectively harnessed the invaluable knowledge and lived experiences embedded within Indigenous cultures. This paper argues that a deliberate and culturally sensitive hybrid model, prioritizing the co-creation and contextualization of knowledge, can offer a more impactful and sustainable pathway towards environmental stewardship and resilience.

Keywords: Western, Centric Education, environmental conservation, Indigenous Knowledge (IK) Digital Technologies Culturally Sensitive Hybrid Learning

*Speaker

Towards a Holistic Gutpela Sindaun Model of Care in Nursing for Papua New Guinea: The Dynamics of Cultural and Christian Beliefs in Nursing Practice

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My study aims to show how Papua New Guinea nurses use their cultural and Christian beliefs, medical knowledge, and skills to achieve *gutpela sindaun* for patients. While reviewing culture and health broadly, I have used Ennio Mantovani's (1993) *gutpela sindaun* model to understand the Melanesian relational values that underscore life's holistic and integrated experience. I have connected this with a further review of the biblical and Christian perspectives of health, care, sickness, and death. This has helped me to understand the dynamics of the PNG cultural and Christian beliefs that complement the biomedical approach. I have redeveloped Mantovani's *gutpela sindaun* model to suit the Melanesian integrated life experience. I call this the redeveloped *gutpela sindaun* model. It reflects the complex dynamics of multidimensional yet interrelated aspects of cultural values that function simultaneously in a given social context to achieve *gutpela sindaun*. Using qualitative interpretive, analytical processes that involve deductive and inductive reasoning, I have understood the dynamic interactions between cultural and Christian beliefs that shape and influence the nursing practice. Based on the concepts presented in the two models of *gutpela sindaun*, I then developed a third model, which I called 'the holistic *gutpela sindaun* model of care in nursing for PNG.' This model is an indigenous epistemological framework that encapsulates the core Melanesian sociocultural values that interact dynamically at all levels of societies to achieve *gutpela sindaun*. It sets the foundation for an integrated, collaborative, and participatory approach to addressing PNG's health and other development issues.

Keywords: Gutpela sindaun, cultural beliefs, Christian beliefs, holistic

*Speaker

Traditional Child Medicine in the South Pacific: New Caledonia, Vanuatu and French Polynesia

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Traditional medicine remains a cornerstone of primary healthcare across Pacific Island communities, particularly for treating children. Despite its widespread use, there is a lack of data regarding the efficacy and safety of traditional remedies used for pediatric care. This interdisciplinary, multi-territorial project, supported by the Pacific Fund, aims to document traditional childhood medical practices and analyze the benefit-risk balance of the most commonly used plant-based remedies across three territories: Vanuatu, New Caledonia, and French Polynesia. Between 2022 and 2024, 305 interviews were conducted with traditional medicine users, herbalists, and healthcare professionals across fourteen islands in the three regions. Altogether, 1,383 remedies were reported, involving between 64 and 104 different plant species depending on the territory.

Across the three regions, several similarities emerged: traditional healing practices are predominantly led by women, the average age of practitioners is between 50 and 55 years, and most remedies are plant-based, primarily involving the use of leaves. Commonly cited species include *Annona muricata*, *Cocos nucifera*, *Psidium guajava* and *Morinda citrifolia*, many of which are used to treat digestive issues, respiratory infections, skin conditions, and wounds. Most of these traditional treatments address common and mild ailments such as colds, wounds, or chickenpox, for which conventional treatments are often limited or unavailable.

While many illnesses and plants are shared across the three territories, each region also presented specific ailments and endemic plant species used in remedies, highlighting the diversity and adaptability of local knowledge. Although certain plants, such as *P. guajava* and *C. nucifera*, are widely regarded as safe and effective, others-such as *Microsorum grossum* or *Melaleuca quinquenervia*-present potential risks, particularly in pediatric use, underscoring the need for further pharmacological and toxicological research.
This project highlights the rich role of traditional knowledge in the Pacific, as well as its relevance to current discussions on improving healthcare systems in culturally appropriate ways. However, it also raises critical questions about safety, informed use, and the need for culturally sensitive health education. Ultimately, the findings contribute to broader reflections on how tra-

*Speaker

ditional and scientific knowledge can be harnessed to promote safe and sustainable healthcare systems in the Pacific.

Keywords: Pacific, Traditional medicine, Medicinal Plants, Ethnobotany, Safety, Efficacy

Transport Processes of Nitrate (NO3-) in Relation to Ground and Surface water Contamination from Perennial Tree Crop Systems in Papua New Guinea: A Review

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[1], Rodney Biri *

1

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Nitrogen is the most demanded macronutrient by plants. It represents a large portion of the total synthetic and organic fertilizers applied in many agriculture systems. Ammonium (NH4+) from those organic and synthetic inputs is transformed by the action of nitrifying bacteria to nitrates (NO3–N) under favorable soil and environmental conditions. Nitrate-N is very mobile in the presence of water. Leaching losses, water erosion of top soil, and surface water run-off represent the important transport processes of this nutrient off-site. The physical landscape, soil and climatic factors may have a combined effect on the dispersion and/or redistribution of this precious nutrient in the environment from agricultural sites. Majority of Papua New Guinea's (PNG) perennial cash tree crops; oil palm, cocoa and coffee, are either cultivated on recent soils mainly from fluvial processes, or are located in the high rainfall areas. Soil water erosion, surface run-off, and leaching losses of nitrate are connected to high rainfalls. In this paper, the transport processes of nitrate in relation to ground and surface water contamination are described. The main economically important perennial tree crop systems are also discussed.

Keywords: PNG, Nitrate, N, Leaching, Groundwater, Perennial cash tree crop systems, Oil palm, Cocoa, Coffee

*Speaker

Understanding the Ballot Box: Attitudes and Social Factors Shaping Voting Behavior Among Solomon Islands National University Students

Jerry Siota * [1,2,3]

[1] Firmina Iyabora – Solomon Islands
[2] Madovia Mali Virivolomo – Solomon Islands
[3] Toncan Eli – Solomon Islands

With the Solomon Islands' General Elections scheduled for April 17, 2024, understanding citizens' voting behaviors is a topic of significant academic and practical importance. This study investigates the voting behavior of Solomon Islands National University (SINU) students, focusing on the attitudes and social factors influencing their electoral decisions. As an educated cohort, their behavior offers insights into the extent to which voters are actively and meaningfully engaging in the democratic process, as well as their awareness of the socioeconomic issues shaping their choices. The research aims to provide recommendations for SINU to enhance its curriculum by integrating governance and civic education, fostering a deeper understanding of political parties, policies, and democratic participation. Additionally, the findings will inform government institutions, such as the Electoral Commission and the Cabinet, on areas to strengthen voter awareness for informed decision-making in future elections. The Ministry of Education and Human Resource Development (MEHRD) can also utilize the results to develop tailored curricula for Early Childhood, Primary, and Secondary education, emphasizing the importance of voting and the value of supporting policies that promote sustainable development and societal well-being. Ultimately, this study seeks to strengthen democratic engagement and governance literacy in the Solomon Islands, equipping future generations to participate meaningfully in the nation's political processes.

Keywords: Voting Behaviour, Solomon Islands National University, Democratic Engagement:Civic Education, Governance Literacy

*Speaker

Understanding the experience of menopause in Kwaio, Solomon Islands: a qualitative study

Relmah Harrington * [1,2], Esau Dorothy *

[3], Emmy Foroasi *

[3], Karen Cheer [2], Sue Devlin [2], Michelle Maclaren [2]

[1] Solomon Islands National University – Solomon Islands
[2] James Cook University – Australia
[3] Baru Conservation Alliance – Solomon Islands

Menopause is a significant biological, social and cultural experience for women globally. Research has shown experiences of menopause are influenced by social structures, spiritual beliefs, cultural norms and language. In the Pacific, very little is known about the experience of women during menopause, with no peer-reviewed literature about women's experience of menopause in Solomon Islands identified by our systematic search. This presentation will present findings from an innovative qualitative study that aimed to explore and describe experiences of menopause with Kwaio women from Malaita, Solomon Islands.
Using culturally situated tok stori research methods, 15 women from mountainous (n=13) and coastal areas (n=2) of East Kwaio participated in individual and group storying, facilitated by two Kwaio women researchers. Data analysis included oral and written transcription and group analysis, facilitated by six women researchers from Solomon Islands and James Cook University, Cairns, Australia.

Five themes were generated to describe women's experiences of menopause: 1) Kwaio ways of describing menopause, 2) Menopause – a part of natural process, 3) Menopause – no sick, no shame, 4) Menopause – everybody's business, and 5) Menopause - happy moments, clean, confident and free. Specific terminology about the experience of *dede* – as menopause is described in Kwaio language - is contextualized culturally. *Dede* is most often seen as a normal process in the lifespan, with families and tribesfolk often aware of the experience of menopause. Women in Kwaio often reported menopause as a positive experience.
Menopause is a locally situated experience. Local biologies – where biology and culture are in continuous relationship – help explain the different experiences of menopause across social and cultural groups. Integrating traditional knowledge, and being careful not to apply unnecessary medical terminologies, medical checklists and medical technologies is critical as we promote health and wellbeing in the Pacific.

Keywords: Menopause, Kwaio, Solomon Islands, Social, Culture, Traditional knowledge

*Speaker

Unraveling floating marine debris in two coastal cities of Papua New Guinea: Sentinel 2 spectral analysis

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Papua New Guinea located in the southeastern Pacific Ocean is currently severing from marine debris that has perceived global attention. Owing to the growing marine debris, that includes beaching of plastics in coastlines resulted from sea-level rise and climate change factors has been noticed widely across global. However, the information regarding beaching of marine debris in the PNG coasts remains scanty. This study is aimed to estimate the beaching of floating of marine debris in Port Moresby (Capital City) and Lae (Industrial City) from 2020 – 2024 by remote detection using Sentinel 2 surface reflectance harmonized data considered as reliable source. The floating marine debris were estimated using floating debris index, environmental plastic index and normalized differential water index. The results indicated the ever-present floating plastics that includes polystyrene, low density polyethylene, polypropene, high density polyethylene, polyethylene terephthalate beached towards Port Moresby and Lae resulted from major anthropogenic littering. This study also endorses the plastics accumulation area for low density polyethylene with 25,257 km2 in Lae and polypropylene with 1960 km2 in Port Moresby region. The overall results indicated the increasing trends of floating plastics debris accumulation in the Lae and Port Moresby coast, manifesting the influences of ocean currents soaring the beaching of plastics. Finally, this study made clear the devastating impact of anthropogenic littering and its consequences in the marine ecosystem highlighting the thrust to be given on plastics management policies in Papua New Guinea

Keywords: Mega plastics pollution, Sentinel 2 images, Floating litter, Management, Papua New Guinea

*Speaker

Urban Challenges, Digital Opportunities: Language Transmission in Port-Vila's urban settlements

Leslie Vandeputte * [1]

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Urbanisation in the Pacific is reshaping linguistic ecologies, with significant implications for the intergenerational transmission of Indigenous languages. This study explores how language practices are evolving in urban settlements in Port-Vila, Vanuatu, focusing on the opportunities and challenges that arise from increasing mobility, mixed-language communities, and access to digital technologies. While urbanisation often leads to language shift and the erosion of vernacular languages (Kulick, 2020), this research argues that digital technologies-such as social media platforms-offer new pathways for sustaining linguistic heritage and identity in Pacific cities such as Port-Vila. Drawing on qualitative data from interviews and participant observation in an urban Melanesian context, the study investigates how families and community members negotiate language use at home, in schools, and in digital spaces. Preliminary findings suggest that while English and national lingua francas dominate formal and media domains, Indigenous languages retain cultural and emotional significance, particularly when supported by grassroots technological initiatives.

References:

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Keywords: Urban settlement, Social Media, Language practice, Port, Vila, Vanuatu, Linguistic ideology, Language shift, Language transmission

*Speaker

User Perspective of Academic Library Services in the 21st Century. A Case Study in a Tertiary Institution in Papua New Guinea.

Geena Iga Kuson * [1]

[1] Pacific Adventist University – Papua New Guinea

Academic libraries worldwide have supported their parents institutions to achieve their mission of providing quality education services to students and teaching faculty (Mahmood et al., 2023). These libraries include traditional services such as reading materials, textbooks, study hubs, manual loan systems and reference aids. Today, the digital revolution has introduced technological services such as printing, photocopying, online database and artificial intelligence (AI) tools as referencing guides. However, while the academic libraries in the 21st century have drastically changed from traditional manual systems to technological driven operations (Momoh & Folorunso, 2019), there are various setbacks encountered by the academic libraries of Papua New Guinea (PNG) that cannot perform likewise. This case study was conducted to examine the user's perception of the academic library services in a developing nation in the 21st century. A qualitative case study has been done with a data collection method of focus group interview and individual semi-interview. A purposive sampling of thirty library users were selected and interviewed in four focus groups and five individual semi-structured interviews. The data collected have been recorded, transcribed and thematically analysed. The study revealed users were equally satisfied with library facilities and dissatisfied with digital services. Participants perceptions were consistent with satisfaction of conducive library environment such as *'I'm impressed of the set-up of the library, the space is big, very peaceful and quiet',* adequate resources, '*easy to locate books..., the library has a lot of computers'.* The participants have evenly expressed dissatisfaction in the current trend of technological services stating *'I haven't used the online database like JSTOR..., the problem is the WiFi network, some of the materials we cannot access',* on the databases that were provided by the library. These responses indicates that users needed to be trained and guided with the technological services. The findings of this study recommend a need for more awareness and trainings to academic students and staff on new technological devices and systems that an academic library provides. Each user is to be trained by librarians to fully utilize technological services to enhance education and research spaces in Papua New Guinea.

Keywords: academic library, library services, twenty first century

*Speaker

Utilizing agriculture education and extension programs as conduits in Plant Health Clinic training

Alois Ndrewou * [1], Rodney Biri *

[1], Audrey Iyeho *

1

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The education system serves as a vital tool to implement key changes in the society. The University of Goroka (UOG), as the lead institution in implementing Plant Health Clinics in Papua New Guinea has embarked on institutionalizing the Plant Health Clinic concept into its curriculum through agriculture courses delivered by the Division of Agriculture & Rural Development (DARD). Through this approach students commencing year two are introduced to crop health and management systems. The Plant Health modules prepared by the Centre for Natural Research & Development (CNRRD) ensure students are trained on specific aspects of crop health beginning with soil care, plant protection, diagnosis of pests and diseases, prescriptions, use of Integrated Pest & Disease Management (IPDM) strategies, and eventually conducting Plant Health Clinics in communities. Since PHC's inception at UOG the various participatory methods such as group work, seminars, assignments, practicals and community activities have been used to train students, and lead farmers from within Eastern Highlands Province, and recently UOG-Sepik Campus. Lessons and experiences from the workshops and trainings reveal lead farmers and students developing better appreciation of crops and the need for farmers to pay closer attention to crop health.

Keywords: Keywords: Agriculture, Plants, Plant Health Clinics, IPDM, University of Goroka

*Speaker

Utilizing non-fungible token (NFT) technologies to preserve cultural histories and artefacts

Rev Dr. Vili Saulala * [1], Dr. George Maeakafa *

[2]

[1] Rev Dr. Vili Saulala – Tonga
[2] Dr. George Maeakafa – Tonga

Abstract 1
Non-fungible tokens (NFTs) are blockchain-based tokens that each represent a unique asset in digital format. It is an irrevocable digital certificate of ownership and authenticity for a given asset, that is securely stored for future authorized access. This research explored the NFT technology as a solution for the universal problem of digitization writing over and erasing important Pacific histories, artefacts, and stories. The research developed methodology to harness the new technology for the social and cultural preservation of artefacts and histories. The methods used addressed the challenges with applying the technology and the challenges of capturing authentic socio-cultural histories. The new digital format has application across the Pacific cultures and people groups for the preservation of what is culturally important and the transmission to future generations. The safe and sustainable development of the Pacific" requires the adoption of new technologies in ways that integrate traditional knowledge s into the new opportunities and solutions for real challenges.

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TOPIC:

Applying Design Thinking Methodology to include meaningful social and cultural input to mobile phone application software development

Abstract 2
Today everyone has access to mobile phone technologies and the use of mobile technologies for business, socializing, and entertainment. However, many mobile phone applications are generic and lack sensitivity to the social and cultural expectations of Pacific users. In this research we explored the design thinking research methodology to design inclusive mobile phone applications. The integration of traditional knowledge, customs, languages and forms of art are critical to developing mobile solutions for today's challenges. This research contributes methodology, and the elaboration of methods in action to solve communication problems in current mobile phone applications. It also challenges many of the contemporary mobile phone application development methods and theories to be user centric. The harnessing of mobile technologies for the safe and sustainable development of the Pacific requires sensitivity to the Pacific and the many cultures, languages, and customs that new technologies are to host and not replace.

*Speaker

Keywords: Non, fungible tokens (NFTs): NFT technology:

Variations of ploidy levels among taros in Papua New Guinea (PNG).

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Taro (*Colocasia esculenta* (L) Schott) is a vital root crop in Papua New Guinea (PNG), where it holds nutritional, cultural, and economic significance. Three botanical varieties are recognized: dasheen (*C. esculenta* var. *esculenta*), eddoe (*C. esculenta* var. *antiquorum*), and wild (*C. esculenta* var. *aquatilis*) taro. In PNG, dasheen and eddoe are widely cultivated in subsistence gardens, while the wild type exists as a natural relative in unmanaged environments. Despite its importance, the cytogenetic diversity of taro in PNG remains not yet well studied, particularly with respect to variations in ploidy levels.
This study aimed to investigate the ploidy levels of taro varieties collected from multiple provinces across PNG. A total of twenty varieties were sampled from Morobe (Finschhafen, Sialum, Lae,), East New Britain (Pomio), Madang (Bogia) and East Sepik (Maprik). Ploidy assessments were conducted using two complementary techniques: chromosome counting from root tip squashes of actively growing plants, and stomatal size analysis via the tape-and-peel method. Both methods served as indicators for ploidy variations amongst the collected varieties. The preliminary results revealed variations in chromosome numbers and stomatal traits, suggesting the presence of both diploid and triploid individuals among the various varieties. This diversity may reflect local adaptation, domestication history or gene flow between cultivated and wild populations. The findings from this study will contribute to the limited but growing body of cytogenetic knowledge on taro and lay the groundwork for future research into its genetic improvement and adaptive potential.

Keywords: Colocasia esculenta, eddoe, dasheen, ploidy level

*Speaker

Vers la transition numérique des langues du Pacifique : une application web pour la gestion collaborative des dictionnaires

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Alors que les modèles de langage (LLM) actuels sont principalement entraînés sur des langues dominantes massivement dotées en ressources, créant une fracture linguistique significative avec les langues autochtones dites " rares ", l'application web de gestion de dictionnaires développée par le projet DiKaLa représente une innovation significative dans la transition numérique et la valorisation des langues du Pacifique. Cette application, développée spécifiquement pour les langues kanak de Nouvelle-Calédonie permet l'édition collaborative de données extraites de dictionnaires historiques numérisés, ainsi que leur augmentation, tout en respectant les spécificités linguistiques de chaque langue (inventaire phonétique, choix orthographiques, structuration morpho-lexicale). L'application permet de combiner technologies modernes et savoir traditionnel en permettant aux linguistes, chercheurs et locuteurs natifs de travailler ensemble sur des dictionnaires existants. Elle intègre des fonctionnalités avancées incluant un système de traçabilité des modifications pour préserver l'historique des interventions collaboratives ; une interface intuitive pour l'ajout et la modification de définitions, d'exemples et de métadonnées mais aussi une option de validation ou de mise à jour orthographique des entrées afin de participer à la diffusion des propositions d'écriture officielles et récentes de ces langues. Les variations diatopiques sont également prises en compte grâce à la possibilité de localiser la variantes dialectales avec un nom de lieu, de district ou d'aire. Cette application constitue une première phase dans le processus de création d'outils numériques ciblés pour les langues kanak et envisage d'être transposable à d'autres langues océaniennes. Elle s'inscrit dans une perspective où les technologies numériques modernes peuvent servir la préservation du patrimoine linguistique océanien, contribuant ainsi à la vitalité et à la transmission des langues du Pacifique pour les générations futures.

Keywords: Outils numériques pour langues rares, innovation linguistique, gestion de dictionnaires, Modèles de langage (LLM) inclusifs

*Speaker

Vibration mode analysis of a 100 m simply-supported steel beam bridge via POD of FEM

Japath Tikil * [1], Professor Yaip Telue [2], Dr Samuel Dunstan [1]

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Bridge vibrations pose significant challenges to structural safety and longevity. This study employs the Finite Element Method (FEM) with Euler-Bernoulli beam elements and Proper Orthogonal Decomposition (POD) to analyze the dynamic response of a one-dimensional beam bridge model under sinusoidal external loading. The governing partial differential equation (PDE) describes the behavior of the lines with terms for inertial forces, damping, and flexural rigidity, discretized into a system of algebraic equations using finite elements of a 1D beam. This numerical approach simulates the bridge's linear displacement field over time
and space, providing detailed understanding of its vibrational behavior through POD mode extraction. This study highlights the importance of integrating advanced computational tools, such as FEM and POD, into structural engineering practice. Furthermore, this research promotes the safe and sustainable development of infrastructure, particularly in the Pacific region, where rising sea level and extreme weather events posesignificant challenges

Keywords: finite, element, method, Euler, Bernoulli, POD, bridge, infrastructure, Pacific, weather.

*Speaker

Virtual Nakamal: A Digital Storytelling Hub for Teaching Comprehension Skills Through Vanuatu's Indigenous Knowledge Systems to Junior High School Students

Marie-Elsie Timothy * [1]

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This paper attempts to explore the development and pedagogical potential of the *Virtual Nakamal*, a culturally grounded digital storytelling hub to be designed to enhance English as a Second Language (ESL) comprehension among Vanuatu's upper-primary to lower junior students. Drawing upon Vanuatu's indigenous knowledge systems, particularly the symbolic function of the nakamal, the platform integrates audio-visual narratives in vernacular languages with English subtitles, as well as, English-speaking narratives aligning with culturally responsive teaching methodologies.
Framed by Vygotsky's Sociocultural Theory, the Multiliteracies Framework, and digital storytelling paradigms, the research will employ a design-based research (DBR) methodology to iteratively co-develop the platform with community stakeholders, including elders, educators, and students. Data collection encompasses comprehension assessments, user interaction analytics, interviews, and classroom observations within rural learning contexts.

The *Virtual Nakamal* functions as a hybrid learning space that combines traditional kastom narratives with modern multimedia features to scaffold comprehension strategies such as sequencing, inference, and vocabulary acquisition. By embodying culturally embedded oral storytelling practices, the platform facilitates cognitive engagement and reinforces identity-based learning pathways. Anticipated outcomes should include improved ESL performance, revitalization of indigenous oral traditions, and strengthened intergenerational connections.
This study will position digital storytelling as both a decolonizing pedagogical tool and a culturally sustaining innovation for literacy development in Pacific Island contexts. Findings will inform educational policy design, digital equity strategies, and culturally aligned curriculum development in Vanuatu and comparable settings.

Keywords: Virtual Nakamal, digital storytelling, ESL comprehension, indigenous knowledge systems, kastom narratives

*Speaker

Wireless Computing in all Area: A Mathematical Approach

Arun Kumar Singh * [1]

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The use of wireless interface is a cornerstone of new-generation communication systems and is widely applied in different domains including IoT, mobile devices and sensor ones. This research paper aims at studying wireless computing from a mathematical perspective and particular areas of discussion include signal propagation, wireless channel characterization, system capacity and error control. We investigate the simple wireless communication and expand mathematical models/theories and equations to analyze the nature of the wireless systems, uses in networking and optimization. Wireless computing has become one of the most important aspects of communication in present world where data transfer across different networks is possible without any physical connections. Wireless computing systems are systems that consist of parameters of ideal systems, and use aspects of signal processing, network optimization and information theory. In this case, we discuss on mathematical models utilized in wireless communication channels; propagation models, path loss equations and interference management. Further, the paper underscores some of the key issues with the use of graph theory, pointers to the queuing theory to organize through realistic algorithm with the general aim of improving the organization of network resources as a means toward scaling up wireless networks. This theory gives details on many of the advanced topics such as error-correcting codes, modulation schemes and cryptographic methods needed in secure communication in wireless computing environment. Hence, this research seeks to provide a mathematical approach in the design, analysis and optimization of wireless systems, which we hope will help in the development of next generation wireless technologies including 5G and IoT.

Keywords: Wireless Computing, Wireless Communication, Signal Propagation, Network Capacity, Error Correction, Mathematical Modeling

*Speaker

Author Index