# ANCHORING CONVERSATIONS

## 18–20 NOVEMBER

**10th IRSPBL | 5th SoTL in the South | 7th SASEE**

# Conference

## Anchoring Conversations: Connection, Collaboration, and Co-Creation for the Future

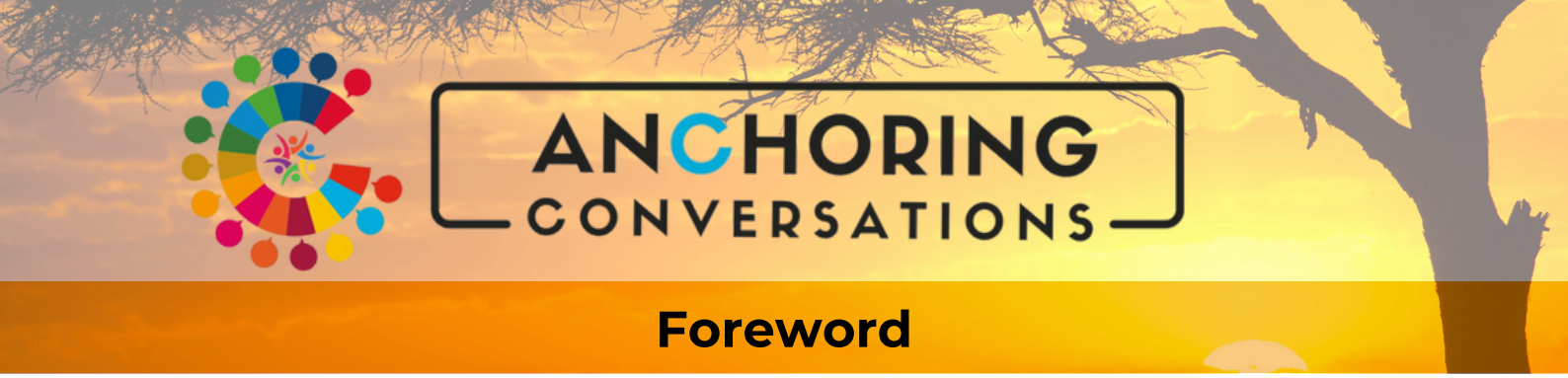
unesco Centre Under the auspices of UNESCO

AALBORG UNIVERSITY Centre for Problem-Based Learning in Engineering Science and Sustainability

FUTURE NATION SCHOOLS

SASEE

SOTL IN THE SOUTH Scholarship of Teaching and Learning in the South




# Foreword

**Editors: Juebei Chen, Lelanie Smith, Yasmin Belal Abouarabi, Karin Wolff, Zachary Simpson and Aida Guerra**

Engineering students are entering a profession defined by rapid change, transformation, and innovation. As graduates, they will navigate volatile, uncertain, complex, and ambiguous environments, striving to deliver sustainable solutions through their professional practices. Historically, engineering education has focused primarily on cultivating deep foundational knowledge in engineering sciences and technical expertise. However, this is no longer sufficient. While these foundations remain essential, today's engineers must also develop a broader set of cognitive skills - such as complex problem-solving, systems thinking, and creativity - alongside social skills like communication and teamwork, and emotional competencies including self-efficacy, empathy, and conflict management. International organizations and policy makers, including the World Economic Forum (WEF) and the Organisation for Economic Co-operation and Development (OECD), consistently highlight the evolving nature of professions, the socio-technological transitions underway, and the shifting demands of the labor market. Despite this, many engineering education institutions struggle to adapt their frameworks and practices to adequately prepare graduates for the realities of the modern workplace. Institutional transformation begins with awareness and dialogue.

*Anchoring Conversations: Connection, Collaboration, and Co-Creation for the Future* is the theme of the joint conference comprising the 10th International Research Symposium on Problem-Based Learning (IRSPBL 2025), the 7th South African Society for Engineering Education (SASEE), and the 5th SoTL in the South. This event is convened by the University of Pretoria and the Aalborg Centre for Problem-Based Learning in Engineering Science and Sustainability under the auspices of UNESCO, in collaboration with eight South African universities, two societies (SASEE and SoTL in the South), and Future Nation Schools. This conference invites dialogue and reflection on critical questions: To what extent is education transforming to meet the skill demands of fast-paced socio-technological transitions? How are institutions supporting students through various educational transitions and pathways, from K–12 to higher education and into the labor market? What knowledge, skills, competencies, and attributes must graduates possess not only to perform but to thrive in both work and life? What forms of agency and what kinds of change agents are needed to drive meaningful and sustainable institutional transformation?

These questions will spark conversations among researchers, educators, practitioners, and leaders across educational levels (K–12 and higher education), career stages (early, mid, and late), sectors (public and private, employers and industry partners), countries and regions (Global North–South, East–West).
They will be discussed during the conference, hosted by University of Pretoria and Future Nations Africa, on 17–21 November 2025. The IRSPBL 2025, 7th SASEE, and 5th SoTL in the South, have collected 103 contributions from 29 different countries, all of which will be presented during the conference and have been compiled in this book.

The contributions cover multiple relevant topics related to conference themes, namely Pedagogical Innovations and Competency Development in PBL, Institutional Implementation and Research Perspectives in STEM Education, Technology, AI, and Digital Learning in STEM Education, Sustainability, Professional Practice, and Global Transformation, Emotions, Well-being, Collaboration, and Social Responsibility, and K12 & Vocational Education. This book represents some of the newest results from research on PBL and best practices to inspire researchers and practitioners to transform their practice and their institutions.

We would like to acknowledge members of local and international committees: Prof. Xiangyun Du, Prof. Zachary Simpson, Dr. Sizwe Errol Nxasana, Prof. Lykke Bertel, Dr. Inês Direito, Dr. Anita Campbell, Prof. Teresa Hattingh, for their expertise, insightful suggestions and support during the process leading to this book.

ANCHORING CONVERSATIONS

# Messages of Welcome

**Prof. Thomas Bak**

## Dean: The Technical Faculty of IT and Design, Aalborg University

Thomas Bak is Professor and Dean of the Technical Faculty of IT and Design at Aalborg University (since October 2022). His research focuses on robotics and control – encompassing autonomous systems, intelligent control, machine learning, and human–robot interaction. As dean, he promotes mission-driven, interdisciplinary research and practice-based education spanning electronics, computer science, robotics, sustainability, planning, architecture, and design.

**Prof. Wynand Steyn**

## Dean: Engineering, Built Environment and Information Technology, University of Pretoria

Prof Wynand Steyn is Dean of the Faculty of Engineering, Built Environment and Information Technology at the University of Pretoria. A registered pavement engineer, his research focuses on vehicle-pavement interaction, accelerated pavement testing, materials, Civiltronics, and instrumentation. He completed his studies at the University of Pretoria and has authored over 200 publications. Prof Steyn is Associate Editor of the International Journal for Pavement Engineering, holds a B3 NRF rating, and is a Fellow of SAICE and SAAE.

ANCHORING CONVERSATIONS

# Conferences Coming Together

Prof. Xiangyun Du

## UNESCO PBL Center Director

Xiangyun Du, Ph.D., is Professor and Director at Aalborg University's UNESCO Centre for Problem and Project-Based Learning. She researches educational transformation through intercultural, curriculum, and faculty development, applying complexity theory to institutional change initiatives globally. Prof. Du has authored over 280 publications and serves in prominent editorial roles internationally.

**About IRSPBL:**

The International Research Symposium on Problem-Based Learning (IRSPBL) is a biennial global forum that brings together researchers, educators, and practitioners to advance knowledge and practice in Problem-Based Learning (PBL). The first symposium was held in 2007 at Aalborg University, initiated by the UNESCO Chair in PBL in Engineering Education, which later evolved into the UNESCO Centre for PBL in Engineering Science and Sustainability (UCPBL). Initially focused on engineering higher education, IRSPBL has gradually expanded to embrace diverse disciplines and educational levels, including K–12, teacher education, and interdisciplinary learning contexts. Since its inception, the symposium has travelled across nine countries of six continents — from Denmark to Australia, the United Kingdom, Malaysia, Spain, Colombia, China, the United States, and now South Africa — reflecting a truly global and inclusive community of practice. IRSPBL aims to foster international collaboration, share cutting-edge research, and explore how PBL can address contemporary challenges in education and society, including sustainability, digital transformation, inclusion, and wellbeing. Over the years, it has become a key platform for strengthening partnerships among universities, schools, and industries, and for nurturing the next generation of scholars and educational leaders worldwide surrounding the topic of PBL.

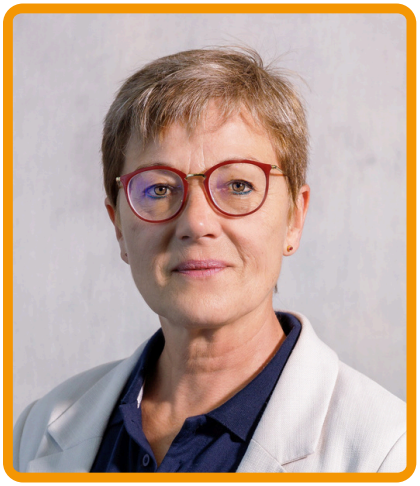
Prof. Zach Simpson

## Chair of SoTL in the South

Zach Simpson is an Associate Professor of Engineering Education at the University of Johannesburg. He holds a PhD in Education from the University of Cape Town. His research interests include higher education studies, engineering education, academic literacies and multimodal social semiotics. Zach is also the editor of the Scopus and DOAJ-listed journal SOTL in the South, a journal dedicated to scholarship of teaching and learning in the global South.

# Conferences Coming Together

**About SoTL in the South:**
SOTL in the South is an online, fully open access, and double-blind peer-reviewed journal dedicated to fostering dialogue and research on teaching and learning in higher education in the global South, or about the global South. It publishes empirical examples of SOTL from the global South, as well as critical reflections on the nature and purpose of SOTL in and for the global South. It should be noted that the global South is not conceived only geographically, but is meant to include any marginalised communities, including those in the geographic 'North'.



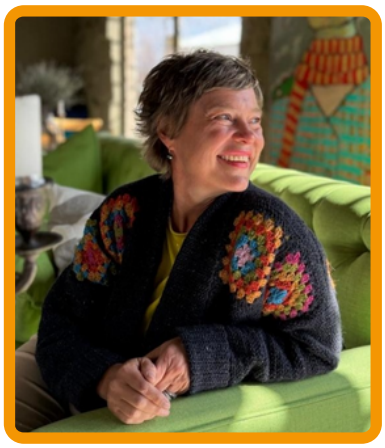
**Prof. Karin Wolff**

## President of the South African Society of Engineering Education (SASEE)

Prof Karin Wolff has over two decades in education and focuses on engineering problem solving and knowledge-building practices. She is Teaching & Learning Advisor in the Faculty of Engineering at Stellenbosch University and President of the South African Society for Engineering Education (SASEE), contributing to international collaborations in staff development.

**About SASEE:**
The South African Society for Engineering Education (SASEE), established in 2011, is an autonomous Society governed by a Board and its members. SASEE serves as an inclusive and collaborative community for all who are committed to advancing engineering education, including academics, students, industry collaborators, community partners, and professional organisations. The purpose of SASEE is to foster meaningful connections across the engineering education ecosystem both within South Africa, across the continent of Africa, and beyond. SASEE has hosted biennial conferences, annual workshops and multiple stakeholder engagement initiatives designed to strengthen the connection between educational practice and engineering education research; foster practice-sharing and alignment between higher education institutions and industry; and promote student interest in engineering. Our affiliated Southern Journal of Engineering Education (SJEE) actively supports the SASEE mission through the active dissemination of engineering education research from a Global South perspective to the broader community.

# Well Being



Prof. Liesl Ebersöhn

## Director in the Department of Educational Psychology, University of Pretoria

Prof. Liesel Ebersöhn is Director of the Centre for the Study of Resilience and Full Professor at the University of Pretoria. A leading educational psychologist, she developed the Relationship-Resourced Resilience theory and serves as President of the World Education Research Association, with over 130 publications and 100 postgraduate completions.

James Huff

## University of Georgia, USA

Dr. James Huff is Associate Professor of Engineering Education at the University of Georgia and Senior Research Associate at the University of Johannesburg. An NSF CAREER Awardee and ASEE Fellow, he leads the Beyond Professional Identity Lab, exploring identity, emotion, and care in professional practice.

Loreto Valenzuela

## Pontificia Universidad Católica de Chile, Chile

Loreto M. Valenzuela is Dean of Engineering at Pontificia Universidad Católica de Chile and Associate Professor in Chemical and Bioprocess Engineering. Her research on biopolymers and biomaterials led to founding FishExtend, a sustainable food innovation startup. She received the 100 Women Leaders (2019) and Ada Byron (2024) awards.

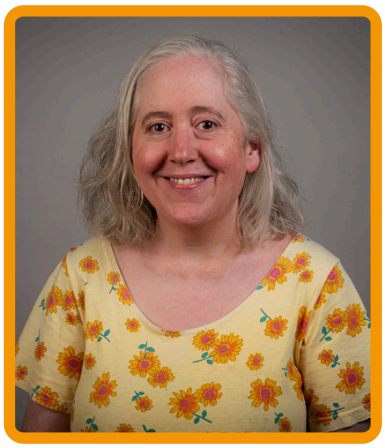
Inês Direito

## University of Aveiro, Portugal

Dr. Inês Direito is Assistant Professor (Research) at the University of Aveiro and Honorary Senior Research Fellow at University College London. Her research explores empathy in engineering education. She is Associate Editor of JEE, on the SEFI Board, and a Fellow of the Higher Education Academy (FHEA).

ANCHORING CONVERSATIONS

# Community Engagement Panel



**Prof. Audrey Falk**

## Engaging Students and Communities

Dr. Falk will discuss ways to engage students in classes with one another, with the course content, with professional networks, and with community organizations and community members. She will provide examples for doing this work that are relevant to both on-ground and online courses. Dr. Falk will offer suggestions and recommendations for sustaining this work over time, through multiple iterations of students and courses. This presentation can be of value to higher education faculty who are seeking to develop or strengthen approaches to student engagement and professional development.

**Peter Gakio Kirira**

## Mount Kenya University, Kenya

Prof. Peter G. Kirira, Deputy Vice-Chancellor at Mount Kenya University, earned a PhD in Pharmaceutical Sciences from Nagasaki University, Japan. He champions student-centered civic engagement, founding a student-led safe water program serving public schools in arid Kenyan regions during his tenure as Director of Foundations & Endowments.

**Samyuktha Penta**

## KG Reddy College of Engineering and Technology, India

Dr. Samyuktha Penta, Associate Professor and Head of CIST at KG Reddy College of Engineering and Technology, holds a PhD in Renewable Energy Sources. A Design Thinking practitioner and Innovation Ambassador, she won the Quanser Sustainability Award (2024) and Intinta Innovator Award, advancing sustainable energy and entrepreneurship.

**Diana Hornby**

## Rhodes Unviersity, South Africa

Diana Hornby, Director of Community Engagement at Rhodes University, has 25 years' experience in early childhood and community development. She leads initiatives linking university teaching and research to local growth. Her RUCE team won the MacJannet Prize (2021) for the 9/10ths Mentoring Programme, transforming Makhanda's matric success. She is pursuing a PhD at Rhodes.

# ANCHORING CONVERSATIONS

## Student & Industry

Karin Wolff

## SASEE

Prof Karin Wolff has over 20 years in education and has specialised in engineering education since 2008. Her research explores complex engineering problem-solving and Social Realism in developing graduates. She is Teaching & Learning Advisor at Stellenbosch University and President of the South African Society for Engineering Education.

Kirsten Smith

## Opti-Num Solutions

Kirsten is a Principal Consultant at Opti-Num Solutions, supporting MathWorks tools integration in Southern Africa's universities and research institutes. With 10 years' experience in engineering consulting and an MSc(Eng) from Wits University, she advances academia–industry collaboration through technology and work-integrated learning programs.

Cédric Bellanger

## Ansys

Cédric Bellanger is Academic Network Manager (EMEA) at Ansys (part of Synopsys). A mechanical engineering graduate from INSA Lyon, he has 25 years' experience in simulation software, from design to business development. Passionate about virtual prototyping, he promotes simulation-based innovation and the advancement of academic engineering education.

Marco Rossi

## MathWorks

Dr. Marco Rossi is part of the MathWorks Academia Team, supporting MATLAB and Simulink use in teaching and research across Europe and Africa. An Aeronautical Engineering graduate from La Sapienza, Rome, he earned a PhD at TU Dresden and lectures on statics and intelligent materials.

Stine Ejsing-Duun

## Aalborg University, Denmark

Dr. Stine Ejsing-Duun is Associate Professor at the Aalborg Centre for Problem-Based Learning in Engineering Science and Sustainability (UNESCO). Her research combines design theory, techno-philosophy, and co-creation, exploring how humans engage with technology to reframe perspectives and enhance STEM education through aesthetic and disruptive learning.

Rodney Genga

## University of the Witwatersrand, South Africa

Dr. Rodney Genga is Associate Professor of Materials Science and Manufacturing Engineering at Wits University and head of the Academic Development Unit. He designs data-driven academic and psychosocial support systems for 7,000 students. His research in advanced alloys and sustainable manufacturing supports automotive, aerospace, and mining innovation.

ANCHORING CONVERSATIONS

# Institutional Transformative Leadership

**Sunil Maharaj**

## University of Pretoria, South Africa

Prof. Sunil Maharaj has been Vice-Principal for Research, Innovation, and Postgraduate Education at the University of Pretoria since 2022 and previously served as Dean of EBIT (2014–2022). With 33 years' experience across academia, industry, and consulting, he is a professional engineer, GEDC Chair (2021), and Honorary Doctorate recipient (Malmö University) for pioneering 5G and rural broadband innovations.

**Anne Merrild**

## Aalborg University, Denmark

Prof. Anne Merrild is Head of Sustainability and Planning at Aalborg University, specializing in sustainable development and Arctic research. She leads interdisciplinary initiatives linking research, teaching, and policy, and serves on international boards fostering collaboration for innovation and sustainable change.

**Jenni Case**

## Virginia Polytechnic Institute and State University

Prof. Jennifer Case is Professor of Engineering Education at Virginia Tech and Honorary Professor at UCT. She has published over 60 journal papers and two books on engineering education and curriculum reform. A founder of SASEE and UCT's Centre for Research in Engineering Education, she is a global leader in the field.

**Pieter Conradie**

## University of Pretoria, South Africa

Dr. Pieter Conradie is Programme Director for the MPhil in Responsible Leadership at the University of Pretoria. A Chartered Accountant with a PhD in Accounting, he has worked in education, auditing, and consulting. His research advances understanding of accountability and ethics in leadership.

**Siseko Kumalo**

## University of Johannesburg, South Africa

Prof. Siseko H. Kumalo is a political theorist and higher education scholar focused on African philosophy, decolonial critique, and feminist theory. His work challenges exclusionary traditions and envisions the university as a space of liberation, transforming the politics of knowledge in higher education.

ANCHORING CONVERSATIONS

# Engineering Education Leadership

Emanuela Tilley

## University College London, UK

Prof. Emanuela Tilley is Professor of Engineering Education and Director of Studies at the UCL Centre for Engineering Education, leading the Integrated Engineering Programme (IEP). As President of SEFI and Principal Fellow of the Higher Education Academy, she advances interdisciplinary, experiential learning and engineering education innovation worldwide.

Thomas Bak

## Aalborg University, Denmark

Thomas Bak is Professor and Dean of the Technical Faculty of IT and Design at Aalborg University (since October 2022). His research focuses on robotics and control - encompassing autonomous systems, intelligent control, machine learning, and human–robot interaction. As dean, he promotes mission-driven, interdisciplinary research and practice-based education.

Mitra Mohd Addi

## UTM Center for Engineering Education, Malaysia

Dr. Mitra Mohd Addi is Deputy Director (Academic & Research) at the Centre for Engineering Education, UTM. Her work focuses on project-based learning, faculty development, and collaborative innovation. A REEN Board Member, she co-authored Academic Leadership in Engineering Education and contributes actively to SEEM and IEEE.

Olayinka Adewumi

## University of Lagos, Nigeria

Dr. Olayinka Omowunmi Adewumi, Associate Professor of Mechanical Engineering and Acting Director of the Innovation and Technology Management Office at the University of Lagos, leads initiatives in technology transfer, entrepreneurship, and research commercialization, driving STEM innovation and academic leadership across the institution.

Gopalkrishna Joshi

## MIT Vishwaprayag University, India

Prof. Gopalkrishna Joshi, Founding Vice Chancellor of MIT Vishwaprayag University, has 30+ years' experience in higher education, combining work in engineering education, government policy, and research. He contributes to academic innovation, institutional development, and education policy implementation at regional and national levels.

# ANCHORING CONVERSATIONS

## TUESDAY 18TH NOVEMBER

| | | | | | |
|---|---|---|---|---|---|
| 07:30 – 09:00 | **REGISTRATION: Future Africa Auditorium Foyer** | | | | |
| 09:00 – 09:10 | **WELCOME ADDRESS**<br>**Prof. Thomas Bak – Dean, The Technical Faculty of IT and Design (AAU)**<br>Future Africa Auditorium | | | | |
| 09:10 – 09:30 | **INTRODUCTION**<br>**Prof. Xiangyun Du – UNESCO PBL Center Director**<br>**Prof. Zach Simpson – Chair of SoTL in the South**<br>**Prof. Karin Wolff – President of the South African Society of Engineering Education**<br>Future Africa Auditorium | | | | |
| 09:30 – 10:00 | **KEYNOTE SPEAKER**<br>**Prof. Liesl Ebersöhn: Engineering education and the science of well-being**<br>Future Africa Auditorium | | | | |
| 10:00 – 10:45 | **PANEL DISCUSSION**<br>Moderator: Disa Mogashana<br>**Well-Being Panel**<br>**Panelists: Loreto Valenzuela (Pontificia Universidad Católica de Chile, Chile); James Huff (University of Georgia, US); Inês Direito (University of Aveiro, Portugal)**<br>Future Africa Auditorium | | | | |
| 10:45 – 11:15 | **TEA/COFFEE BREAK** | | | | |
| **VENUE** | **CONFERENCE 2** | **CONFERENCE 1** | **THE HUB (A)** | **THE HUB (B)** | **BREAK-AWAY A** |
| 11:15 – 12:30 | **Research Papers A1: Emotion, empathy and affect in higher education teaching and learning**<br>Moderator: Shannon Chance | **Research Papers A2: Work-based and industry-aligned teaching and learning**<br>Moderator: Bronwyn Swartz | **Research Papers A3: Universities in context: Schooling and vocational education and training**<br>Moderator: Thabang Ngwenya | **Research Papers A4: Engineering Education Practice**<br>Moderator: Reuben Govender | **Unconference Session** |
| | Empathy and education for sustainable development: a state-of-the-art review<br>***Inês Direito, Aida Guerra, Diana Bairaktarova, Bárbara Gabriel and Robertt Valente*** | Work-based learning: integrating academia, industry, and community<br>***Cody Mann, Bart Johnson, Ron Ulseth and Katherine Ulseth*** | Mapping High school science Teachers' approaches to STEMification: An exploratory cross-case analysis<br>***Christian Skelmose Jensen, Søren Hansen, Emilia Jun Nielsen, Mette Møller Jeppesen, Bettina Dahl, Lars Bo Henriksen, Sofie Otto, Camilla Guldborg Hundahl and Lykke Brogaard Bertel*** | Scalable VR Solutions for Engineering Education: A Continuous Improvement Framework<br>***Clint Steed, Mia Mangaroo-Pillay and Karin Wolff*** | |
| | Emotion norms in engineering education – more diverse than expected<br>***Johanna Lönngren, Maria Berge and Katerina Pia Günter*** | Defining the Supporting Roles of Facilitators in Project-Based and Work-Based Learning<br>***Cody Mann and Darcie Christensen*** | Transitioning to Project-Based Learning in Data Science Education: An Action Research Study at a Danish Vocational School<br>***Nicolaj Riise Clausen, Søren Hansen, Kim Guldholt, Bjarne Poulsen and Lykke Bertel*** | Same but not The Same: Describing and shaping meaning-making in engineering mathematics problems<br>***Matheus de Andrade, Bettina Dahl and Karin Wolff*** | |
| | Addressing wicked problems through empathy-enhanced design-based team learning: illustrating implicit and explicit approaches<br>***Jan Van Maele, Veerle Bloemen, Inês Direito and Diana Bairaktarova*** | A Framework for Implementing Flexible Project-Based Learning for Computing Education in Resource-Constrained Environments: A Case Study of the Namibia University of Science and Technology<br>***Munyaradzi Maravanyika*** | Working in a problem-based manner with mathematics and crafts gives meaning to mathematics at Danish vocational schools<br>***Bettina Dahl, Søren Hansen, Jette Schaarup, Lena Lindenskov and Frank Justesen*** | ESP32 as a low-cost teaching tool for mechatronics<br>***Abrie Oberholster*** | |
| | Emotion and engineering identity in small group learning – piloting a computational model approach<br>***Johanna Lönngren, Loïs Vanhée, Roland Tormey and James Huff*** | Enhancing engineering professional skill development through industry-led guest lectures: A transformative learning approach in African engineering education<br>***Vicent Rutagangibwa, Irene Magara and Comfort Musiimenta*** | Grasping and shaping the emergence of GenAI in education: Insights from a workshop series with practitioners<br>***Sofie Otto, Lykke Bertel and Stine Ejsing-Duun*** | | |
| 12:30 – 13:30 | **LUNCH** | | | | |
| **VENUE** | **CONFERENCE 2** | **CONFERENCE 1** | **THE HUB (A)** | **THE HUB (B)** | **BREAK-AWAY A** |
| 13:30 – 14:45 | **Research Papers B1: Responsibility to society and community**<br>Moderator: Lykke Brogaard Bertel | **Research Papers B2: Well-being and care in higher education teaching and learning**<br>Moderator: Johanna Lönngren | **Research Papers B3: Developing our students as researchers**<br>Moderator: Juebei Chan | **Research Papers B4: How we want our graduates to learn**<br>Moderator: Helen Inglis | **Unconference Session** |
| | The concept of Global Transformation Labs<br>***Anders Rosén, Lena Gumaelius and Susanne Nilsson*** | Staff reflections on the interdisciplinary project at the Wits School of Arts: Enabling Caring Pedagogies and Sustainable Education<br>***Brett Pyper, David Andrew, Kate Bernberg, Catherine Duncan, Renzo Filinich, Alexandra Halligey, Andrea Hays, Bongani Ngomane, Smangaliso Ngwenya, Sipho Sono, Boitumelo Tlhoaele, Petro Janse van Vuuren*** | Student reasons for choosing to study Mechanical Engineering: Building research capacity through a pilot study<br>***Lisakhanya Mayisela, Corrinne Shaw and Bruce Kloot*** | Who are the professional engineers participating in continuing engineering education?<br>***Bente Nørgaard, Ellen Sjoer, Christopher Smith, Patricia Caratozzolo, Sonia Gómez Puente, Katriina Schrey-Niemenmaa, Anna Overgaard Markman, Nicolaj Riise Clausen*** | |
| | The First Year Experience: Engineering for Social Change<br>***Naasirah Mohamed, Luvuyo Kakaza, Bronwyn Swartz, Ayesha Reiners and Suresh Ramsuroop*** | Teaching care as part of engineering ethics<br>***Alison Gwynne-Evans, Avela Mqhakama and Carin Zvandasara*** | Teaching a doing thing - relatability factors influencing teaching honours level research<br>***Karabo Sitto-Kaunda, Tebogo Vincent Makhubela and Ofentse Moroeng*** | Investigating student engagement in emerging technology engineering pathways<br>***Anthony Perry, Jonathan Lee Montoya and Krista Steele*** | |
| | Investigating Factors that Influence Faculty Learning in Service Learning<br>***Surendra Bandi, Rohit Kandakatla, Samyuktha Penta*** | Caring Pedagogies in Action: Utilising Student Engagement Data to Develop Sustainable Learning Environments<br>***Kristo Kotsi, Mian Xie and Matheus de Andrade*** | Design-Expert to Streamline Chemical Engineering Experimental Research and Development: Mixed-Method Perspectives<br>***Rishen Roopchund, Naadhira Seedat, Olawumi Sadare and Kapil Moothi*** | Open-ended Modelling Problems<br>***Jessica Swenson*** | |
| | Work in Progress: Engineering student perceptions of learning through service (LTS) at Ashesi University, Ghana<br>***Heather Beem and Sampson Kofi Nani*** | Rewiring from Within: Exploring how participation in curriculum development Impacts Engineering Academics professional and personal well-being<br>***Lelanie Smith, Janine Hechter, Liesel Ebersöhn, Bronwyn Swartz, Inês Direito*** | Navigating Identities in the Transition from Engineering Education to Engineering Education Research: A Reflective Study of First-Year MPhil and PhD Students in Engineering Education Research.<br>***Vicent Rutagangibwa, Comfort Musiimenta, Gavin Ninshaba, Doris Chasokela, Sullayman Greatman Mansaray, Sharne Mokhethi and Corrinne Shaw*** | | |
| | Work-in-Progress: Exploring cultural responsiveness in Engineering Service Learning – A Case Study<br>***Bonolo Mokoka and Teresa Hattingh*** | The design of orientation week activities to foster a sense of belonging for engineering students: Work-in-Progress<br>***Baatseba Ramushu, Helen Inglis, Zachary Simpson*** | Leveraging Undergraduate Research for Emerging Academic Staff Development: A Mentorship Pipeline in Engineering Education<br>***Clint Alex Steed, Mia Mangaroo-Pillay and Karin Wolff*** | | |
| 14:45 – 15:15 | **TEA/COFFEE BREAK** | | | | |
| **VENUE** | **CONFERENCE 2** | **CONFERENCE 1** | **THE HUB (A)** | **THE HUB (B)** | |
| 15:15 – 16:45 | **Workshop 1**<br>From matters of fact to meta-affect: Exploring emotional support in teaching and learning on wicked sustainability challenges in engineering education<br>***Johan Holmén, Johanna Lönngren and Jessica Swenson*** | **Workshop 2**<br>Empathy and Ethics in Engineering Education: A Paradigm Shift for a Human-Centered Future<br>***Diana Bairaktarova, Inês Direito, Jan van Maele and Veerle Bloemen*** | **Workshop 3**<br>Exploring Understandings of Technological Literacy in K-12 Science Education<br>***Camilla Guldborg Hundahl and Lykke Brogaard Bertel*** | **Workshop 4**<br>Co-learning in the innovation hub: a way to improve transdisciplinary partnerships<br>***Chiara Treglia, Dominique Fürst, Marcello Sala, Chantal Brans, Ana Valencia Cardona and Isabelle Reymen*** | |
| 16:45 – 18:00 | **REST/EXERCISE** | | | | |
| 18:00 | **WELCOME RECEPTION**<br>**Prof. Francis Peterson – Vice-Chancellor (UP)**<br>Future Africa Dining Hall | | | | |

# ANCHORING CONVERSATIONS

## WEDNESDAY 19TH NOVEMBER

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|---|---|---|---|---|---|
| 07:30 | **GENTLE YOGA IN THE GARDEN**<br>Alternative Venue (if it rains): CONFERENCE 2 | | | | |
| 09:00 – 09:30 | **KEYNOTE SPEAKER**<br>**Prof. Audrey Falk: Engaging Students and Communities**<br>Future Africa Auditorium | | | | |
| 09:30 – 10:30 | **PANEL DISCUSSION**<br>Moderator: Jason Oberholser<br>**Community Engagement Panel**<br>**Panelists: Samyuktha Penta (KG Reddy College of Engineering and Technology, India); Peter Gakio Kirira (Mount Kenya University, Kenya); Diane Hornby (Rhodes Unviersity, South Africa)**<br>Future Africa Auditorium | | | | |
| 10:30 – 11:00 | **TEA/COFFEE BREAK** | | | | |
| **VENUE** | **CONFERENCE 2** | **CONFERENCE 1** | **THE HUB (A)** | **THE HUB (B)** | |
| 11:00 – 12:30 | **Research Papers C1: Integrated curricula**<br>Moderator: Karin Wolff | **Research Papers C2: Engaging students**<br>Moderator: Curwyn Mapaling | **Research Papers C3: Thinking about thinking**<br>Moderator: Maggie Chetty | **Research Papers C4: Teaching and learning with technology**<br>Moderator: Euan Lindsay | |
| | Collaborative Opportunity: Growing a Community around Integrated Engineering<br>***Rebecca Bates, Emanuela Tilley, Jenna Carpenter and Susan Lord*** | Spatial design for embodied participation in Higher Education<br>***Zach Simpson, Anders Bjorkvall, Arlene Archer*** | Scoping Literature Review: Engineering Logic<br>***Josua Wesch and Teresa Hattingh*** | Teaching Control Systems with Interactive MATLAB Live Scripts<br>***Arnold Pretorius and Jamie Bok*** | |
| | Experiences of the transition from a traditional to an integrative project-based curriculum<br>***John Mitchell and Emanuela Tilley*** | Comparing Retrospective and Pre-Post Survey Measurement of First-Year African Engineering Students' Skill and Perception Changes through a PBL Course<br>***Yohance Lewis, Sampson Kofi Nani, Charity Ampomah and Heather Beem*** | Traditional to Transformative : Empowering Education with Computational Thinking and Skills<br>***Adri van Nieuwkerk and Prebantha Moodley*** | First-Year Engineering Students' Use of Digital Technology for Learning: The Role of Agency<br>***Lilian Ganduri, Corrinne Shaw and Brandon Collier-Reed*** | |
| | The ANCHOR Framework: A Holistic Approach to Transdisciplinary and Regenerative Built Environment Education<br>***Calayde Davey*** | Developing and piloting a Q-study on pedagogical challenges in problem- and project-based learning for first-year engineering students<br>***Niels Erik Ruan Lyngdorf, Bettina Dahl and Dan Jiang*** | Keeping Research Current: Using Living Literature Reviews in Educational Research<br>***Anita Campbell and Disaapele Mogashana*** | Transforming learning environment towards PBL-Hybrid: A Case study of student centered e-learning implementation methodology at Gulu University<br>***Okot David Pakono, Heillyn Camacho, Tabo Geoffrey Olok, Ann Bygholm, Lone Dirckinck-Holmfeld*** | |
| | Designing successful and sustainable interdisciplinary PBL in engineering education: A cross-case analysis of System Projects in practice<br>***Lykke Brogaard Bertel, Pernille Scholdan Bertelsen, Pia Rosenquist Kruse, Ove Kjeld Andersen, Nicolai Brodersen Hansen, Markus Lächtefeld, Jens Frederik Dalsgaard Nielsen, Ulrik Nyman, Maj-Britt Quitzau, Mateus Halbe Torres, Maiken Winther, and Louise Møller Haase*** | Enhancing Student Engagement: A Toolbox for Systematic PBL Implementation<br>***Meng Yuan, Juebei Chen, Dennis Friedrichsen, Izhar Mithal Jiskani, Sara Bjørn Aaen and Xiangyun Du*** | Scaffolding Complexity in Structural Dynamics: A Digital Twin-Based PBL Intervention Using Legitimation Code Theory and Computational Thinking<br>***Mohammad Pourbehi and Suresh Ramsuroop*** | Developing Student Competency in Engineering Tools Using Open-Source Software in Undergraduate Engineering Education<br>***Cila Botha and Willem Van Niekerk*** | |
| | Towards Integrated Engineering Curricula: South African Case Studies in Context with UCL's IEP Approach<br>***Lelanie Smith, Emanuela Tilley, Bronwyn Swartz, Nicky Wolmarans, Teresa Hattingh*** | Reflectively Mapping the Zone of Proximal Development in Industrial Engineering<br>***Meelan Roopa, Makoena Sebatjane and Karin Wolff*** | Mathematics for Sustainable Development (MATH4SDG): A Capacity building project in Uganda and Tanzania<br>***Bettina Dahl, Guttorm Alendal, Eunice Mureithi and John Magero Mango*** | Integrating Collaborative Technologies within a BIM Course for Ireland's AEC Sector: Overview and Proposed Research Directions<br>***Shannon Chance*** | |
| | Creating context-specific problem-based learning materials for Engineering Education in South Africa: reflections on challenges and outcomes of the BambaSonke Design Challenge<br>***Robyn Clark, Nicky Wolmarans, Disaapele Mogashana, Bronwyn Swartz and Chikondi Gurira*** | Building towards better learning: evolution of practical design, build and test activities in an introductory Mechanical Engineering Design Course<br>***Reuben Govender and Adriaan de Villiers*** | The complementary nature of Computational Thinking and Critical Making in a Project-based Learning (PjBL) course on Design for Manufacture (DfM)<br>***Francesco Ciriello, Tabbi Wilberforce Awotwe, Jicheng Gong, Samuel Piper, Charlotte Palmer and Ana Rubio Denniss*** | | |
| 12:30 – 13:30 | **LUNCH** | | | | |
| **VENUE** | **CONFERENCE 2** | **CONFERENCE 1** | **THE HUB (A)** | **THE HUB (B)** | **AUDITORIUM** |
| 13:30 – 14:45 | **Research Papers D1: Interdisciplinarity and Teamwork**<br>Moderator: Dan Jiang | **Research Papers D2: Integrating Sustainability**<br>Moderator: Teresa Hattingh | **Research Papers D3: Fostering inclusion in higher education**<br>Moderator: Inês Direito | **Research Papers D4: Teaching and learning with artificial intelligence**<br>Moderator: Cila Botha | **Unstructured Conversations** |
| | AAU Professional skills Lab (ProLab): Promoting Transversal Skill Development in STEM through Student Self-Selected Interdisciplinary Workshops<br>***Nicolaj Riise Clausen, Lykke Bertel, Bente Nørgaard, Niels Erik Ruan Lyngdorf, Giajenthiran Velmurugan and Aida Olivia Pereira de Carvalho Guerra*** | The role of engineering educators' perceptions in the design and delivery of a module on sustainability.<br>***Carin Zvandasara, Corrinne Shaw and Brandon Collier-Reed*** | Building bonds: the transition from teamwork to friendship in engineering education and its influence on the well-being of female students<br>***Sandra Ireri Cruz Moreno and Shannon Chance*** | Re-thinking engineering education outcomes in the light of AI.<br>***Anne Verhoef, Willem van Niekerk, Jean du Toit and Liezl van Dyk*** | How to find funding for international collaborations?<br>***Rea Lavi*** (Massachusetts Institute of Technology) |
| | The WOW Project: An Experiential Learning Approach to Developing Teamwork and Project Management Competencies in South African Engineering Education<br>***Ann Lourens, Curwyn Mapaling, Nicole Truter*** | Integrating Problem-Based Learning and Design Thinking for Sustainability: A Practical Approach to Teaching Real-World Problem Solving in Undergraduate Education<br>***Sanjay Hanji, Veeranna Yempally, Preethi Baligar, Krishnendu Jana, Avinita Gautam, and Gopalkrishna Joshi*** | Celebrating Refugee Innovation: Shifting from Deficit to Asset-Based Engineering Perspectives<br>***Pelumi Abiola-Oseni, Nada Alreyyes, and Robyn Paul*** | AI-Supported Tutoring and Cognitive Learning Styles in an Engineering Mathematics Refresher Course<br>***Gustav Potgieter, Brandt Klopper, Liezl van Dyk and Liandi van den Berg*** | How to streamline credit transfer procedures?<br>***Hamimah Kadzo Mwandary*** (Kenya, University of Nairobi, from Giriama and Muslim (marginalized)) |
| | The Bigger the Team, the Bigger the Dream: Navigating the Madness of Leading Large-Scale Interdisciplinary Projects<br>***Fiona Truscott and Lelanie Smith*** | A Comparative Analysis of Embedding Sustainability in Integrated Engineering Curricula: A case study of traditional (UCL) vs emerging (TEDI-London) universities<br>***Vivek Ramachandran and Rhythima Shinde, Emanuela Tilley*** | The importance of diverse economic contexts in African student success<br>***Helen Inglis, Esther Matemba, Disaapele Mogashana*** | Co-Created and Community Owned Chatbots in PBL: Work-in-Progress<br>***Niels Erik Ruan Lyngdorf, Nicolaj Riise Clausen, Sofie Otto and Anita Campbell*** | Implementing PBL for technology programmes.<br>***Arun Patil*** (Curtin Singapore) |
| | Bridging Gaps in Engineering Teamwork: A Literature Review through the Lens of Cultural-Historical Activity Theory (CHAT)<br>***Ranthekeng Jones Moloisane and Nicky Wolmarans*** | Building a Sustainable Engineering Future: The Collaborative Effort of ECSA and Academic Institutions in Reducing Attrition in the Skills Pipeline<br>***Nonhle Sibisi, Lehlohonolo Lefalatsa, Sivuyile Jokazi, Josias Mamabolo, Ada Dienga and Brenda Nkhumise*** | Intersectional Barriers to Women's Participation in Mining-Related STEM Professions in South Africa: A Work-in-Progress Analysis of Challenges, Policies, and Pathways to Inclusion<br>***Gosiame Noge*** | Deploying Multidisciplinary AI-Personas to Enhance Critical Thinking and Communication Skills in STEM Education<br>***Liezl van Dyk, Roelof Burger, Jacoba H Bührmann*** | |
| | How to teach teamwork in a PBL curriculum<br>***Carola Hernandez and Liliana Maritza Melo Ramos*** | CREATE-ing New Perspectives: A Transformative Learning Approach to Sustainability in First-Year Engineering Education<br>***Bronwyn Swartz*** | Awareness of universal design for learning among health science profession educators in a South African Higher Education Institution<br>***Zinhle Mvelase*** | | |
| 14:45 – 15:15 | **TEA/COFFEE BREAK** | | | | |
| **VENUE** | **CONFERENCE 2** | **CONFERENCE 1** | **THE HUB (A)** | **THE HUB (B)** | |
| 15:15 – 16:45 | **Student & Industry Panel**<br>Moderators: Marco Rossi (MathWorks) & Karin Wolff (SASEE) | **Workshop 5** | **Workshop 6** | **Workshop 7** | |
| | **Harnessing students' use of Gen AI to enhance their readiness for an AI-driven industry**<br>***Panelists: Stine Ejsing-Duun (Aalborg University); Rodney Genga (Wits University); Kirsten Smith (Opti-Num Solutions); Cedric Bellanger (Ansys)*** | University of the Future: an open discussion on the implementation<br>***Dominique Fürst, Chiara Treglia, Marcello Sala, Chantal Brans, Ana Valencia, Isabelle Reymen*** | Adopting PBL – Hybrid in resource constraint settings: Perspectives from Gulu University – Introducing Student-Centered eLearning Implementation Methodology<br>***Lone Dirckinck-Holmfeld, Geoffrey Olok Tabo, Ann Bygholm, Heilyn Nunez Camacho, Vivian Perry Drateru, Vincent Canwat, Iben Jensen, Clara Kansiime, Walter Komakech, Margaret Namubiru, David Okot Pakono and David Ross*** | Ethics in Action: Transforming Engineering Classrooms Together<br>***Shannon Chance and Inês Direito*** | |
| 16:45 – 18:00 | **SASEE BGM**<br>***All South African Participants***<br>Future Africa Auditorium | **REST/EXERCISE** | | | |
| 18:00 | **CONFERENCE GALA DINNER**<br>**Prof. Wynand Steyn – Dean of Engineering, Built Environment and IT (EBIT) Faculty (UP)**<br>Future Africa Dining Hall | | | | |

# ANCHORING CONVERSATIONS

## THURSDAY 20TH NOVEMBER

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|---|---|---|---|---|---|
| 07:30 | **GENTLE YOGA IN THE GARDEN**<br>Alternative Venue (if it rains): CONFERENCE 2 | | | | |
| **VENUE** | **CONFERENCE 2** | **CONFERENCE 1** | **THE HUB (A)** | **THE HUB (B)** | |
| 09:00 – 10:00 | **Institutional Transformative Leadership Panel**<br>Moderator: Sunil Maharaj (UP) | **Workshop 8**<br>(09:00 – 10:30)<br>Co-creating collaborative and embodied group learning experiences: Entangled stories of emotions, materialities, and the uses of a banana<br>***Katerina Pia Günter, Maria Berge and Johanna Lönngren*** | **Workshop 9**<br>(09:00 – 10:30)<br>Exploring Interpretative Phenomenological Analysis: A Hands-on Workshop for Engineering Education Researchers<br>***James Huff and Curwyn Mapaling*** | **Workshop 10**<br>(09:00 – 10:30)<br>Beyond Borders: International Fellowships as Your Research Launchpad<br>***Shannon Chance and Inês Direito*** | |
| | ***Panelists: Anne Merrild (AAU, Denmark); Jenni Case (VirginiaTech, US/SA); Pieter Conradie (UP); Siseko Kumalo (UJ)*** | | | | |
| 10:00 – 11:00 | **Engineering Education Leadership Panel**<br>Moderator: John Mitchell | | | | |
| | ***Panelists: Emanuela Tilley (UCL, UK); Thomas Bak (AAU, Denmark); Mitra Ali (UTM Center engineering education, Malaysia); Olayinka Adewumi (University of Lagos, Nigeria); Gopalkrishna Joshi (MIT, US);*** | | | | |
| **VENUE** | **CONFERENCE 2** | **CONFERENCE 1** | **THE HUB (A)** | **THE HUB (B)** | |
| 11:00 – 12:30 | **Research Papers E1: Perspectives on engineering education in Africa**<br>Moderator: Corrinne Shaw | **Research Papers E2: Enhancing student resilience and success**<br>Moderator: Nicky Wolmarans | **Research Papers E3: Problem-based learning in action**<br>Moderator: Bente Nørgaard | **Unconference Session** | |
| | Exploring Shared Understanding and Practices of Experiential Learning Among African' Engineering Educators<br>***Cedrick Kwuimy, Yashin Brijmohan, Precious Biyela, Michelle Maphosa and Vicent Rutagangibwa*** | Applying Deductive Thematic Analysis to Explore Resilience in South African Engineering Students: A Practical Guide<br>***Morney Mostert, Anita Campbell and Renee Smit*** | Leveraging problem-based learning for sustainability transitions. Insights from two professional courses<br>***Simon Skårhøj and Lone Dirckinck-Holmfeld*** | | |
| | Implementing an institutional transformation in science and engineering: the University of Nairobi example<br>***Anne Nkoidila, Beatrice Ndaisi, David Kariuki, Thomas Ochuku Mbuya, Jackson Maalu, Jarrett Onyango Odwallo, Marc Zolver; Presenter: Prof. George Ooko Abong*** | Understanding Undergraduate Engineering Students' Academic Resilience Over a Full Year of Study<br>***Erin Brady*** | Heatmapping Key Competencies STEM Students Present in PBL Environments<br>***Euan Lindsay, Giajenthiran Velmurugan, Stine Ejsing-Duun and Antonia Scholkmann*** | | |
| | A scientometric study of contributions by African-affiliated authors to engineering education research journals 2004-2023<br>***Bill Williams and Andrew Valentine*** | Early Warning System with Targeted Interventions for an Undergraduate Program at a University of Technology<br>***Manimagalay Chetty and Amos Adeniyi*** | Integrating Project-Based Learning and Cooperative Education for Future Engineers: Insights and Best Practices from the Iron Range Engineering Bell Model<br>***Yuezhou Wang, Ron Ulseth and Cody Mann*** | | |
| | Exploring the Policy landscape in alignment to Outcome based Education in four East African countries: Uganda, Kenya Tanzania and Rwanda<br>***Esther Matemba, Shamim Nassar, Irene Magara, Cecile Uwimana and Yashin Brijmohan*** | Assessing mentorship of undergraduates students at the University of Johannesburg: A Case-study<br>***Morena Nkomo, Katlego Lokhele and Teresa Hattingh*** | | | |
| | Enhancing Engineering Education Through Reflective Practice in a Public University in Nigeria<br>***Daniel Salau, Esther Osho, Olayinka Adewumi and Moses Olayemi*** | The Student Inner and Interpersonal Growth Assessment (SIIGA): Instrument Development and Evidence for Reliability and Validity<br>***Celeste Combrinck, Lelanie Smith, Bonolo Mokoka, Disa Mogashana*** | | | |
| | Enhancing the 21st century learning skills through problem-and project-based a hybrid learning: A perspective from Gulu University, Northern Uganda<br>***Vincent Canwat, Margaret Namubiru, Walter Komakech, Ann Kathrin Meilandt Bygholm and Lone Dirckinck-Holmfeld*** | | | | |
| 12:30 – 13:30 | **LUNCH** | | | | **MAMELODI CAMPUS VISIT**<br>(12:30 – 16:00) |
| **VENUE** | **CONFERENCE 2** | **CONFERENCE 1** | **THE HUB (A)** | **THE HUB (B)** | |
| 13:30 – 15:00 | **Workshop 11**<br>Mapping Research Terrain: Navigating Systematic Literature Reviews<br>***Inês Direito and Shannon Chance*** | **Workshop 12**<br>Anchoring Conversation on Experiential Learning In African Indigineering Education<br>***Cedrick Kwuimy, Michelle Maphosa, Yashin Brijmohan, Precious Biyela and Vicent Rutagangibwa*** | **Workshop 13**<br>How to enact transformative change for global responsibility in engineering education<br>***Jonathan Truslove, Robyn Clark, Sarah Hitt, Linae Baron, Emma Crichton and Chikondi Gurira*** | **Workshop 14**<br>Introducing every student to systems thinking with the SAFO framework<br>***Rea Levi & Lykke Brogaard Bertel*** | |
| 15:00 – 15:30 | **CLOSING OF IRSPBL/SASEE/SoTL CONFERENCE**<br>Future Africa Conference 2 | | | | |

ANCHORING CONVERSATIONS

# Thank You to the Organising Commitee

**Prof. Lelanie Smith**
Conference Chair

**Prof. Karin Wolff**
SASEE Conference Chair & SASEE President

**Prof. Aida Guerra**
IRSPBL Conference Chair

**Prof. Zach Simpson**
SoTL in the South Conference Chair

**Prof. Xiangyun Du**
UNESCO PBL Center Director

**Prof. Teresa Hattingh**
SASEE Team

**Dr. Dan Jiang**
AAU Team

**Dr. Juebei Chen**
AAU Team

**Ms. Jeanette Arboe**
AAU Team

**Prof. Lykke Brogaard Bertel**
AAU Team

**Ms. Bonolo Mokoka**
UP Team

**Ms. Sharne Mokhethi**
UP Team

**Mr. Matthew Beekman**
UP Team

**Mr. Marios Joannou**
UP Team

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Centre for Problem-Based Learning in Engineering Science and Sustainability

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SASEE

SOTL IN THE SOUTH
Scholarship of Teaching and Learning in the South