NSTF
National Science & Technology Forum

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Artificial Intelligence in STEM education

an NSTF-pro*SET* Discussion Forum

18 August 2026

Speakers' Biographies

10:00-10:30

Beyond Detection: Designing AI-Resilient Assessment for Authentic Learning in STEM Education



Prof Upasana Gitanjali Singh is an Associate Professor in Information Systems and Technology at the University of KwaZulu-Natal (UKZN), South Africa (SA), and an National Research Foundation (NRF) C2-rated researcher specialising in Educational Technology. Her research focuses on artificial intelligence (AI) in higher education, digital transformation, technology-enhanced teaching and learning, assessment innovation, and digital inclusion.

Prof Singh has published extensively in leading international journals and books, supervised numerous postgraduate students, and delivered keynote addresses and invited talks across Africa, Asia, Europe, and Australia. She actively collaborates with universities and international organisations to advance responsible, ethical, and human-centred AI in education.

10:30-11:00

r²TLC: Human-Centred AI in STEM Education

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Prof Reuben Dlamini is a scholar and an information and engineering technology practitioner with more than twenty years of experience in higher education. He is currently an Associate Professor in Educational Information and Engineering Technology at the University of the Witwatersrand (Wits) School of Education. Anchored in the pursuit of social justice, his work addresses historical inequalities in SA's education system, explores effective digital pedagogical practices in diverse classrooms, and advances the intersection of teaching, learning, and creativity (TLC) through digital and transformative pedagogies. His research focus cuts across multiple disciplines: Computer Science, information technology (IT) and Education, and involves implementation and evaluation of complex digitalization initiatives, and pedagogical integration of information and communications technology (ICT) interventions in education to improve access to quality education and reduce educational inequalities. Prof Dlamini has been at the forefront of strategic ICT initiatives that promote educational equity and digital inclusion across SA. Through intersectional lens (access and inclusion), Prof Dlamini has authored and co-authored more than 60 peer-reviewed journals, book chapters and conference proceedings, worked as principal investigator (PI)/co-PI on more than 5 research projects and co-authored/edited 3 books. His research projects focus on expanding classroom boundaries and educational opportunities to eradicate any form of inequalities among the historically underrepresented, underserved and marginalized populace.

11:00-11:30

Teaching Engineering Students to Think with AI, Not Through AI: Best Practices for Responsible AI Use in Technical Problem Solving



Dr Christiaan Oosthuizen is a Mechatronics Engineer, senior lecturer, researcher and Section Head at the Tshwane University of Technology (TUT), where he teaches and supervises

undergraduate and postgraduate engineering students and manages a department. He holds a PhD in Mathematics and Computer Science as well as a Doctorate in Engineering (Mechatronics Engineering). He serves on the NSTF/pro*SET* Committee and Board of the STEMulator NPC.

His academic and research interests span mechatronics, control systems, electric vehicle technologies, AI, and engineering education. He is actively involved in curriculum development and engineering education initiatives aimed at preparing graduates for the rapidly evolving technological landscape. Dr Christiaan also co-leads the TUT Solar Car Team, mentoring students in the design and development of advanced electric vehicle systems.
With a strong interest in the responsible integration of AI into engineering education, his work explores how AI can enhance student learning, problem-solving, design thinking, and productivity while maintaining academic integrity and sound engineering practice.

11:30-12:00

Indigenous Knowledge, STEM & Africa's Authentic Contribution to AI



Mr Dumisani Sondlo is the Founder and current Managing Director of the Digital Enterprise Africa (DEA), an SA-based ecosystem for AI Skills, Innovations and Entrepreneurship, a role which he assumed earlier this year. Previously, he served as the National AI Policy & Governance Lead at the Department of Communications and Digital Technologies (DCDT). In this role, Dumisani had the technical responsibility of shepherding the country's draft policy on AI through all five (5) clusters of government, until it received Cabinet approval.

Previously, he played key roles in aggregating the indicators which measure the uptake of digital technologies, in the digitizing of government services, in supporting ICT small businesses, and the execution of strategies for the development of high-level human capital. He has over 26 years of work experience in the ICT sector in SA, including the public and academic sector. His experience in policy-making dates back to the groundwork undertaken towards the Telecommunications Act (#103 of 1996).

Dumisani is also an experienced entrepreneur and corporate governance practitioner – and is in possession of: 1. An Honours degree in Communications (University of Fort Hare (UFH)), plus 2. An

Honours and 3. A Master's Degree in Public Administration (both Cum Laude) (Stellenbosch University (SU)), as well as 4. A Master's in Business Administration (SU).

Dumisani has written four e-books which teach the basics of AI, and is also the author of a must-read book on leadership and navigating the treacherous waters of change and transformation. His year 2026 book: *Lion Among Sheep* is available on Amazon and Takealot.

12:00-12:30

Closing or Widening the Divide? Integrating AI into STEM Lecturing and Assessment across a Multi-Campus Rural TVET College



Ms Elbé Els is the Deputy Principal: Innovation and Development at Maluti TVET College, a public college operating across eight campuses in the Thabo Mofutsanyana District of the Free State. Her directorate leads the college's digitalisation and digital transformation agenda, alongside its management information systems (TVETMIS), partnerships, registration services and entrepreneurship functions.

Elbé has spent close to three decades in the Technical and Vocational Education and Training (TVET) sector, progressing from lecturer to campus manager, student support services manager and acting deputy principal roles before moving into her current innovation portfolio, most recently as Assistant Director: Blended Learning. This trajectory has given her a practitioner's grounding in the realities of teaching, learning and technology adoption across under-resourced rural campuses.

She holds a Post-Graduate Diploma in TVET Management (University of Pretoria (UP)) and a BTech in Human Resources (Central University of Technology (CUT)), and has completed further professional programmes including ICT for TVET Lecturers, ISO 9001:2015 quality management, and the Advanced Management Development Programme (University of the Western Cape (UWC)). She is a strong advocate for equitable, low-cost approaches to digital and AI literacy that work within the infrastructure and capacity constraints faced by rural colleges.

12:30-13:00

When AI Meets the Real Classroom: STEM, Access and Human Learning



Prof Elma Marais is an Associate Professor in the Faculty of Education at North-West University (NWU). Her teaching and research focus on technology-enhanced learning, teacher education, language education, play-based pedagogy, and the thoughtful integration of emerging technologies in education. Her work includes the use of mixed reality simulations, LEGO® Six Bricks®, digital platforms, and AI to support meaningful learning and teacher development. She has a particular interest in how technology can strengthen pedagogy without losing sight of the human relationships at the centre of education. Her current work explores responsible and accessible approaches to AI integration, with attention to teacher preparation, learner engagement, equity, and the realities of diverse and under-resourced educational contexts.

13:00-13:30

AI and the digital divide: what does it mean for education?



Dr Michael Gastrow is the Director of the Centre for Science in Society within Human Sciences Research Council (HSRC). He is also a Professor of Practice at the DST/NRF/Newton Fund Trilateral Research Chair in Transformative Innovation, the 4th Industrial Revolution (4IR) and Sustainable Development at the University of Johannesburg (UJ). His research focuses on leading multi-disciplinary teams investigating questions of relevance to science and technology policy, particularly with respect to the dynamic interplay between scientific advancement, technological development, and societal change. This scope includes the use of theoretical frameworks drawn from the study of innovation for inclusive development, the public understanding of science, science communication, and the societal impacts of science and technology, amongst others.