

STEM education – disruptions and the future NSTF/proSET Discussion Forum

Day 2

30 August 2022

Speakers' biographies



Day 2 (30 August 2022) 9:10-10:10

Doing Digital Offline – creative solutions to bridge the digital divide in South Africa

Dr Derek Fish is a director of Unizulu Science Centre. After graduating, Derek taught in a high school as a Science and Mathematics teacher for three years. Since then he has been running Unizulu Science Centre in Richards Bay, South Africa, for over 30 years. Derek's passion is presenting Science and Mathematics to children in a way which encourages curiosity and inspires them to study further. He has presented science shows all over the world and attended all eight of the Science Centre World Congresses, on every continent. He has represented Africa on the International Programme Committee for these Congresses and serves on the Global Committee of ASTC (The Association of Science and Technology Centres). He is a Council member, founder and former President of the Southern African Association of Science and Technology Centres (SAASTEC). In 2016 he completed his doctorate in Physics Education with a study based in his science centre. In response to the COVID crisis he has pioneered a unique set of offline physics videos for matrics. Derek has won many awards for his contributions to science, including the 1999 National Science and Technology Forum (NSTF) Award for the best individual contribution to Science in South Africa. He has also been a finalist for the Science Communication Award three times, and Unizulu Science Centre has won the NSTF Award for a not-for-profit organisation.



Day 2 (30 August 2022) 10:40-11:10

Career guidance and awareness of the importance of STEM

Ms Kgaugelo Pule is NSTF’s Research Assistant for the STEMulator, a virtual learning environment in which children can explore, discover and learn. Born from the vision of the NSTF it encourages children of all ages to pursue STEM-related subjects and careers. She works with NSTF/proSET Committee member and Project Manager for the STEMulator, Richard Gundersen.



Day 2 (30 August 2022) 11:10 -11:40

STEM education innovations, including remote learning, robotics and coding, and any other innovations

Dr Kgadi Mathabathe is the Deputy Director: Academic Development in the Department for Education Innovation, University of Pretoria. Her areas of research are largely in the field of Science Education specifically Chemistry Education. She conducts research focusing on innovative teaching and learning strategies that promote self- and socially regulated learning as well as the development of student and educator metacognition. She has supervised postgraduate level research focusing on collaborative learning and inquiry based science education. She has published in local and international journals in her field. She has over 10 years’ experience of training pre- and in-service science educators.

Ms Kathryn Kure is the CEO of the STEAM Foundation NPC. The 2020 Future of Jobs report by the World Economic Forum ranks Innovation as the most important skill and Creativity as fifth on a list of fifteen skills that will be required by employers in 2025. Specifically, Skill 1 is Analytical Thinking and Innovation and 5 is Creativity, Originality and Initiative. The



Day 2 (30 August 2022) 11:40 -12:10

**Enabling Innovation through Creativity and
Collaboration**

strategic importance of innovation and creativity to jobs generally, never mind within the STEM disciplines is not disputed. But what is often overlooked is that critical importance of what have often been inappropriately described as “soft skills” to The Fourth Industrial Revolution. Complex, wicked problems cannot be solved without enabling scientists and others to work in large, cross-disciplinary groups encompassing divergent thinkers working coherently to engage directly to solve what is both challenging and often unforeseen. The United States just recorded five rare, one thousand year rain events within a single month. The creativity required to deal with the consequences both seen and unforeseen of the Anthropocene Era demand nimble, creative thinkers. It is therefore nonsensical not to embed creative thinking within STEM teaching and learning. Given the disruptions of the pandemic and the need to scale, it is further argued that Open Education Resources are enabled, both in terms of Copyright Reform and Tax (specially Section 18A) to maximise the potential South Africa has with a National Curriculum, with a focus on hands-on and minds-on experiments that embed co-operative learning practices into the methodology.