

**Prof Machdel Matthee, Ph.D., Univeristy of Pretoria, South Africa – Keynote speaker**

### **Preparing future generations for digital disruption: the development of 21<sup>st</sup>-century skills**

“What is lying ahead will be utterly transformative for humanity”. These are the words of Ray Kurzweil, the computer scientist, inventor, and futurist, who refers to the radical changes in interacting and living with digital technologies in the future. The recent release of genAI is a case in point, disrupting ways of work, teaching and learning. Digital disruption is deceptive – its growth follows an exponential curve, deceptively slow at first, followed by rapid development and adoption. How can we prepare humanity and future generations for these radical adjustments in skills needed, beliefs and attitudes? 21<sup>st</sup>-century skills, often associated with the 4Cs – creativity, critical thinking, communication and collaboration – are re-emphasized by scholars as imperative to navigate living and thriving in the age of AI and digital disruption. The teaching and assessment of these skills present many challenges in formal education structures. Teaching these skills across the digital divide remains a constant struggle. This is the demanding task that we have to undertake in South Africa. The South African youth presents both sides of the digital divide due to socio-economic inequality. In this presentation, I illustrate an approach to this problem. The development of computational thinking is considered ideal for teaching the 4Cs in the digital age. A computational thinking game based on tangible coding was developed and distributed, and it currently reaches over 120,000 schoolchildren from more than 1000 schools. Many of these children are from rural areas. The game has now spread to over 11 countries around the world. Although no formal impact studies have been done, I will illustrate the diverse outcomes of the game with some examples.

**Machdel Matthee** is a professor at the Department of Informatics at the University of Pretoria in South Africa. She is interested in developing cognitive skills such as critical thinking, problem-solving, computational thinking, and AI literacy, which are called for in a technology-driven world. Her research on these topics has been published in several international outlets. Other research interests include educational technologies, cybersecurity, fake news and user experience. She is a senior editor of the Journal of Information Systems Education (JISE) and associate editor of IEEE Transactions on Education (ToE) as well as Communications of the Association of Information Systems (CAIS).