

Why coding alone won't prepare our children for the 4IR

By [Jenny Retief](#)

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As with many countries, South Africa is seriously considering including coding into the national curriculum. In fact, earlier this year, Cyril Ramaphosa made it very clear that inclusion will be an objective he intends to see come to fruition during his presidency. This is commendable - but is it realistic?



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The truth is that including coding alone will not prepare our children to face the coming technology tsunami known as the fourth industrial revolution and, as things stand today, there is no disputing the fact that we are producing school-leavers who are ill-equipped to operate effectively in a digital world. So the answer is "probably not". At least, not right now.

The fourth industrial revolution is going to bring both massive opportunities and new challenges, and education should be an instrument to prepare tomorrow's workforce. But, to get there in South Africa, we'll need to see a fundamental shift in education and a return to the basics.

The shift

The younger generation are referred to as digital natives because they've had access to technology since they were old enough to hold it. This exposure needs to be ramped up, and one way of doing this is to give them access to better equipped early learning facilities. There are endless studies on the advantages of providing children with a strong foundation in numeracy and literacy at a pre-school stage and if we start preparing them here, via digital platforms, we'll already be ahead of the game.

Moving into Grade R and up, rather than ring-fencing subjects like coding and technology, it would make more sense to inter-weave these subjects into all aspects of the school curricula, as it is in the real world. Government intends on ensuring every learner is armed with a tablet, so this can be used to facilitate that, for example, using a spreadsheet to draw climate tables for Geography, setting reminders in a digital calendar rather than in a paper diary, or introducing CAD tools to assist in creating specification diagrams.

Globally, there aren't many educational institutions effectively set up to keep pace with the rate of change in technology. When you consider that, on average, a third of the skill sets required to perform today's jobs will be wholly new by 2020, it's easier to understand that teaching a subject, which focuses solely on execution, means running the risk of equipping learners with potentially obsolete abilities.

That's not to say that execution skills should be ignored, but rather that the effort should go into teaching the skills that will underpin the use of any tool. Here, you're looking at computational thinking, data literacy, agile problem solving methods and, perhaps most importantly, the techniques to rapidly learn new hard skills.

Beyond that, we should probably be giving thought to how we hone, at school level, the skills that AI machines will not be able to emulate easily – creative and critical thinking, teamwork and empathetic interaction.

The basics

Before any of the above can be realised, it should be understood that unless school infrastructure improves, we'll just be further entrenching the digital divide. Kids in well-resourced schools able to effectively teach the subject will benefit but, for those attending under-served schools, coding will be just another point of failure. Schools need resources to teach STEM subjects, and we're not just talking about labs and computer equipment, but rather basics like water, electricity and connectivity.

From there, foundational skills needed to enable coding at school include reading, maths, logic and pattern recognition, along with a willingness to experiment, permission to play and the ability to focus and sustain a train of thought. Beyond basic reading skills, comfort in reading is vital, as is the ability to research, sift through information, and select that which is relevant to finding solutions for particular problems.

Tablets make good sense when you consider the current challenges and cost constraints experienced in trying to get up-to-date text books into the hands of our learners, but they're only useful to engaged audiences. They would prove useless if not interleaved with active engagement with and application of real world learning with a resultant ability to create and solve problems.

The human factor

At the end of the day, we must also acknowledge that not everyone is a coder, and coding must be introduced to our school environments with a broader picture in mind. It may be that our world tomorrow is a digital one, but that doesn't mean we're only shaping engineers and robotics champs.

A high-tech world where many basic goods and services are produced by robots is going to make the things that are intrinsically human even more precious and valued. Along with STEM jobs, there will be many opportunities in art and creative pursuits of all kinds that focus on providing humans with ways to connect with one another in an increasingly automated world.

In fact, considering the rapid evolution of the job market, most individuals relying on just one skill set or narrow expertise will

be unlikely to sustain long-term careers in economies of the future. Our non-coding children must be prepared from an early age to consider careers that encompass inter-disciplinary connections, global citizenship values, including empathy and character, and non-cognitive employability skills such as problem solving, critical thinking, project management and creativity.

The World Economic Fund (WEF) released a paper recently titled [Transforming Education Ecosystems](#). In it, the team deep dives global challenges being experienced and overcome by several countries that have successfully incorporated coding into their school curricula.

These educational institutions share common attention to several key action areas, including starting with early childhood education, the creation of future-ready curricula, ensuring a professional (and educated) teaching workforce, early exposure for these children to the workplace with ongoing career guidance, truly enabling digital fluency, and a new approach to lifelong learning.

With seemingly insurmountable challenges, South Africa will have to take learnings from the experiences of its counterparts to ensure it creates the best foundation for the next generation of workers - but it will have to start at the very beginning.

ABOUT THE AUTHOR

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