

Skills are key to the future of work amid unprecedented technological transformation



The world is poised on the cusp of major technological revolution, with new applications for existing technologies and advancements in multiple areas, from quantum computing to extended reality (XR) and clean energy. In South Africa, this offers significant opportunity to foster innovation, drive economic growth, and create new job sectors. However, with these waves of change come the urgent need for upskilling and reskilling, as emerging technologies will reshape the job landscape in ways that many people are not prepared for. In this future, mastering new skills will be a critical factor in determining South Africa's ability to harness these opportunities and compete on the global stage.

Opportunities in transformation

Advancements in fields like quantum computing, XR, and clean energy present opportunities for countries like South Africa to make significant progress in transformation and global competitiveness. However, the country's success will hinge on developing the necessary skills to harness these innovations. Quantum computing, for instance, has the potential to revolutionise industries like drug development and logistics, but South Africa must invest in education and research to build a workforce skilled in areas like computational science and quantum algorithms.

Similarly, XR, which includes virtual, augmented, and mixed reality, offers vast opportunities across sectors like mining, manufacturing and tourism. By developing skills in immersive design and interaction modelling, South Africans can capitalise on XR's potential to enhance industries and create new economic opportunities.

Meanwhile, the transition to clean energy is both an environmental imperative and an economic opportunity. South Africa's natural resources position it to lead the green energy revolution, but this requires skills development in green steel manufacturing, energy storage, and renewable infrastructure. By building a workforce equipped to drive these innovations, South Africa can create a thriving green economy while tackling climate change.

Emerging technologies and future job creation

Futuristic technologies are already beginning to shape the job market. The Internet of Bodies (IoB) is transforming healthcare by using connected devices that are implanted, ingested, or worn on the body to enable real-time data collection and interaction with healthcare systems. This supports personalised medicine, remote monitoring, and even remote surgeries, giving patients access to top surgeons globally. On an energy front, space-based solar cells could revolutionise the green energy landscape. We are also seeing the emergence of autonomous systems in multiple areas. In mining, there are hazard monitoring robots, autonomous robotic haulage trucks, automated drilling machines, and self-driving trucks. There are autonomous devices for space and sea exploration, and even sea rescue.

Communication technologies are evolving too. With the advent of LiFi (data transfer through light) and 6G networks, new avenues for jobs in telecommunications and cybersecurity will emerge. Holographic communication could soon be the norm in virtual meetings, necessitating skills in hologram design, communication systems, and data management.

These advancements and cutting-edge developments require specialised skills to drive innovation, and keeping pace with global change will require significant investment in skills development.

Tackling the human element

There is no denying that technology will replace many traditional jobs, especially those at lower skill levels, but new ones will emerge in their place. Robotics and automation will increasingly handle tasks like manufacturing components, but there will still be a need for human intervention, particularly in high-skill roles such as robotic engineering, software development, and cybersecurity. Blockchain technologies and artificial intelligence will introduce new applications to protect personal information and improve system efficiencies, further shifting job requirements towards higher skill levels.

While there is an underlying fear that technology will displace jobs, the reality is that it will create new opportunities in ways we have not yet fully understood. However, without proper reskilling and upskilling initiatives, South Africa's unemployment rate could worsen. The key to preventing this lies in smart, targeted investments in education, particularly in STEM fields (Science, Technology, Engineering, and Mathematics). These efforts should be coupled with vocational training and professional development programmes to ensure that workers are equipped for the jobs of tomorrow.

A call for corporate innovation and youth engagement

Large corporations must start thinking differently about the future of work, especially in a globalised

context where geographical boundaries are increasingly irrelevant. The youth need to be proactive about developing the skills that will make them relevant in this new era. Fields like software engineering, XR content creation, and green technology development will require a new generation of innovators who can navigate these rapidly changing landscapes.

To ensure South Africa's future prosperity, collaboration between government, the private sector, and educational institutions will be essential. Together, they can provide the training, resources, and infrastructure needed to equip South Africans with the skills necessary to thrive in a technology-driven future.