# The Impact of the Fourth Industrial Revolution on Southern African Higher Education

Simon Vurayai*

ARTICLE INFO

ABSTRACT

This study examined the impact of the fourth industrial revolution (4IR) on higher education in Southern Africa. Results from the study suggest that the impact of 4IR on higher education can be encapsulated by its potentials in revolutionizing the way knowledge is produced, accessed, and disseminated through innovative pedagogical approaches and cutting-edge research activities, and the way higher education institutions are governed and operated, commonly known as the digitalization of higher education. The study recommended that policy makers need to actively advocate for the provision of resources and development programmes to support technological capacity among academics and students within the Southern African higher education sector.

## 1. Introduction

The technology, the internet, and the online services are of great importance in today's global society. The impact of the Fourth Industrial Revolution (4IR) is now being felt in all parts of the world. Developed countries are now integrating 4IR technologies, and this is changing the way humans interact with the physical world in many different ways. This includes digital mobile devices and the internet, 3D printing, distributed control systems such as smart electricity grids and manufacturing systems, machine learning and artificial intelligence, management of big data, algorithms, and the internet of things and cyber-physical systems (Babane, 2022; Dagada, 2024; Dlamini & Kheswa, 2023). These technologies and the work associated with them are changing at a very fast pace. It is believed that there is still much that is not yet known while the boundaries between the physical, digital, and biological world are getting increasingly blurred (Borrageiro & Mennega, 2023).

The understanding and acceptance of 4IR technologies and their implementation will predominantly depend on the level of development of the applied discipline and the nation in which it is established hence education must now rethink its mission to take a more active role in improving innovation and the educational system to balance the broad knowledge economy (Alabi & Mutula, 2022). The perceived threats or opportunities for institutions of higher education have been addressed in

many studies. There have been calls to universities to adopt this new industrial revolution; yet, there is need for academia to purchase, implement and competently use these sophisticated technologies (Moll, 2021). The technology divide, along with the skills institutions have available to confidently implement even today's more straightforward technology, is a cause for concern (Marwala, 2021). Since the 4IR will significantly impact education systems, it is imperative to provide present and future students with the necessary knowledge and skills to succeed or even survive in the new world. Currently, there is a gap between knowledge and skills, and the concern is that a significant portion of the emerging workforce risk becoming redundant (Baijnath, Motala, & Menon, 2023). Hence, there is an urgent need to understand the implications of the 4IR for the mission, curricula, mode of delivery, and structure of higher education. Therefore, this study examined the impact of 4IR on the higher education sector with a specific focus on Southern Africa.

## 2. Background to the Problem

Southern Africa, in contrast to other sub-Saharan African regions, has a relatively well-established higher education system, which is characterized by an increasing demand for access. The southern African region comprises of countries such as Botswana, eSwatini, Lesotho, Namibia, South Africa, and Zimbabwe, each with its own distinct history and context of higher education. South Africa is the most industrialized country and has the most developed higher education system in the region. It is well known for its strong research output and high publication rates. This is in line with the fact that South Africa holds the majority of public and private higher education resources and has the highest number of researchers, research doctorate graduates, and journal publications in the region. However, after years of significant growth and expansion of the higher education system, the South African government has recently focused on the improvement of the quality of the system, particularly in the area of research output and postgraduate education.

The Fourth Industrial Revolution (4IR) is the most recent and widely discussed knowledge revolution that is expected to bring about far-reaching change to all aspects of society, including, but not limited to, the economy, higher education, and everyday life. According to Dagada, (2024) 4IR is driven by the increasing digitalisation and interconnection of products, processes, and services that are fusing the physical, digital, and biological spheres, leading to the creation of new technologies and concepts such as artificial intelligence (AI), the Internet of Things (IoT), and autonomous vehicles. In terms of its impact on higher education, the 4IR is perceived as a major opportunity to transform and improve teaching, learning, and knowledge transfer in universities worldwide. It is widely argued that the integration of advanced digital technologies such as virtual and augmented reality, 3D printing, and intelligent tutoring systems into the teaching and learning process can help students improve critical thinking, collaboration, and innovation (Ngoqo, 2022). Also, the adoption of modern technologies can help learners and educators alike to develop '21st-century skills', such as complex problem-solving, digital literacy, and emotional intelligence (Borrageiro & Mennega, 2023). However, 4IR also presents challenges to higher education, many of which are yet to be properly addressed, especially in the context of Southern Africa. For example, according to the Mosia (2022), one

of the defining features of the 4IR is the increasing digitalisation and interconnection of the world across geographical, cultural, and income lines. This means that nations and societies that are already behind in terms of technological development will fall even further back, as the 'first movers' of the 4IR, such as those in the developed world, are advancing at an exponential rate. This phenomenon is often referred to as the '4IR paradox of globalization', whereby certain parts of the world continue accumulating the benefits of technological advancement while others are left further behind (Lewis, 2020). This is particularly relevant to Southern African countries (Maringe & Chiramba, 2022a), as the region still faces considerable challenges such as poverty, political instability, and lack of infrastructure that are preventing the region from fully participating in the 4IR. Also, limited scholarly attention has been given to explore and understand the 4IR in the context of Southern African higher education. As a result, there is currently very little evidence or literature that systematically investigates the challenges and opportunities that the 4IR poses to this region, which means that higher education leaders and policymakers are working in an evidence vacuum when addressing the issue.

## 3. Purpose of the Study

This section, explains the purpose of the study, the reasons behind the decision to research this particular field, and the significance of the study. The purpose of the study is to examine the impact of the Fourth Industrial Revolution (4IR) on higher education in Southern Africa. The research identifies the challenges faced by Southern African countries as they adapt to the requirements of 4IR in the higher education sector. The study is important in the sense that the findings of the research will help to understand the real situation of Southern African countries in terms of adapting to the 4IR in higher education. It will contribute to the existing body of knowledge in the field of 4IR and the higher education sector in the context of Southern African countries. The research outcomes will provide clear recommendations to policymakers and the leaders of the higher education institutions in the region. It will support them to take strategic actions to align their vision, missions, and structures with the demands of 4IR. With these initial insights onto the purpose of the study in mind, the article will go on to discuss the essential concepts and implications of 4IR in higher education later in the second section.

## 4. Conceptualising 4IR

The second section presents the definition of the Fourth Industrial Revolution and identifies its main characteristics. Described as a technological revolution that will fundamentally alter the way people live, work, and relate to one another (Cele, Bhana, & Matli, 2023) the Fourth Industrial Revolution is said to be different from the previous three revolutions in terms of its velocity, scope, and systems impact. It is identified in the literature as a revolution that is 'fusing' the physical, digital, and biological worlds together - and creating both opportunities and challenges across all

sectors, including education (Maringe & Chiramba, 2022b). The main technologies that are driving the revolution, such as artificial intelligence, gene editing, and biotechnology, and the impact of these technologies on industry and society shows the power of 4IR.

## 5. Impact on Higher Education

The Fourth Industrial Revolution is having a transformative effect on the world. Unlike previous industrial revolutions which were driven largely by analogue and manual processes, the 4th is characterised by a range of new technologies that are fusing the physical, digital and biological worlds, impacting all disciplines, economies and industries (Mkansi & Landman, 2021). The creation of smart products such as smart cars, smart watches and smart houses has been made possible by the advancement of the internet. Companies and individuals can gather more and more data, use big data to their advantage and customise products and services for the end user. This has led to "smart factories" creating a so-called "fourth industrial revolution". By being more efficient in this process of mass customisation and using smart technology to maintain a lean supply chain, the revolution is changing the way manufacturers market and sell products. Higher education is not spared of these rapid changes that are spearheaded by technology.

The current landscape of higher education is also shaped profoundly by the transition from an industrial economy to a knowledge economy. The shift requires a range of new skills and capabilities, including a re-imagining of the role of higher education (Tsakeni & Molotsi, 2022). Quality enhancement, student success, student learning and development, learning and teaching resource effectiveness and innovation in areas such as curriculum development and delivery are all major areas of focus for HEFCE - the Higher Education Funding Council for England. The purpose of this article is to discuss the research challenges facing Southern African higher education institutions in the context of the 4th Industrial Revolution (4IR).

### 5.1 Opportunities and Challenges

Furthermore, the pressure to secure external funding for research and to demonstrate the impact and engagement of research with 'users' can sometimes result in a reductive and exploitative view of the potential value of technological and scientific work (Mhlanga & Moloi, 2020). That is, research projects which are already working with industry partners or which can demonstrate high-profile economic or social outcomes are often given priority in the allocation of university resources and the development time offered to individual researchers. This presents a risk that Southern African research priorities may become increasingly set by external, non-academic interests, rather than by researchers themselves or by the local community.

However, there are significant challenges that need to be carefully considered and navigated in order to make the most of these technological developments and opportunities. For example, the academics and students who would arguably most benefit from exposure to the latest technologies (Dlamini & Kheswa, 2023), that is, those in fields such as engineering, physical sciences, and

computer science - are often those in Southern Africa that are hindered by a lack of reliable internet connectivity and aging or inadequate laboratory and research infrastructure. Such disparities in the ability to 'do' technology can serve to deepen and perpetuate inequalities (Matimaire, 2020), both in terms of who has access to certain types of knowledge and learning, but also in terms of whose research is able to develop and be disseminated most effectively.

In addition, the development of new and innovative technologies has the potential to significantly enhance the teaching, learning, and research activities of academic institutions. For example, by providing academics and students with access to the latest generation of cyber-physical and computational tools (Dagada, 2024; Olivier, 2022), it is hoped that Southern African universities can continue to produce high-quality educational experiences and ground-breaking research.

The fourth industrial revolution presents a variety of challenges and opportunities for higher education in Southern Africa. On the one hand, universities are increasingly expected to produce knowledge and graduates that can drive and support a highly technological and interconnected global economy. This means that higher education curricula and research agendas need to become ever more closely aligned with the needs of industry and society.

## 6. Research Challenges in Southern African Higher Education

The previous section of this study discussed the opportunities and challenges presented by the Fourth Industrial Revolution in relation to higher education as a general concept. Moving from this general focus to the specific challenges faced by Southern African higher education institutions means moving from the theoretical to the practical; from thinking about the ways in which technology and the 4IR are affecting education worldwide, to considering how these large-scale shifts are impacting the day-to-day experiences and practices of teachers, students, and academic leaders in a particular part of the world (Mhlanga, Denhere, & Moloi, 2022; Mutekwe, 2022).

### 6.1 Access to Technology and Infrastructure

In the case of Southern African countries, the lack of access to technology and modern infrastructure in most regions of the world is deeply felt. Lack of access affects not only students, but also institutions as well. Universities cannot implement digital learning which enables the students to be competitive in today's digital and knowledge-based economies (Mhlanga et al., 2022). Most universities in the region engage in traditional, teacher-centered modes of instruction. Class sizes are too large (Matimaire, 2020; Mukute, Burt, Francis, & De Souza, 2020) and as a result, students get little or no chances to meaningfully interact with one another or with their teachers.

Most of the universities in the region lack modern scientific equipment. There is also limited access to computers, internet, central science laboratories, and research facilities which ultimately affect scientific research in the region (Mhlanga et al., 2022). Frequent power cuts which result in interrupted studies and damage of scientific equipment is another problem. Such conditions seem to form a self-perpetuating cycle in which beneficiaries of the existing traditional knowledge grow

into future leaders who are also less enthusiastic about new technology and new ways of generating knowledge. This situation serves to widen the technological knowledge gap between the developing world and the developed world and among Southern African countries themselves. This leads to the isolation of scholars and students in the region from the global scientific community, which is heavily reliant on information technology (Mukute et al., 2020). The whole scenario translates into limited research output, knowledge, and discovery, and the region would continue to be a consumer of modern technologies and scientific knowledge.

Currently, the abolition of this technological gap seems to become more and more of a "hot topic" in the region, being the main concern of most governments. The use of the internet is expanded through initiatives like providing free internet access in some cities and towns and construction of undersea fancy fiber optic cables through the Indian Ocean to connect to the global internet highway. The initiative seems to be providing some hope for the establishment of a modern technology and scientific knowledge-based society (Lewis, 2020). The region is dreaming of high-speed and wide coverage undersea internet cables. Such initiatives need to be complemented by a tremendous leap from leaders in the region's political and scientific institutions towards embracing technological changes in every aspect of lives, particularly in higher levels of education. The strategies can be implemented along the development of modern technological research in most universities and in every society to complement the effort of generating and communicating new scientific knowledge in the region.

The knowledge and experience sharing relationships with developed countries can also be encouraged in order to provide access to technology and modern infrastructure. As a result, governments should come up with intensive policies to modernize the region to be able to solve these problems and to achieve a knowledgeable society within the framework of a global and information-based world. Also, combined effort between the governments and regional technological research institutions is significantly needed to develop modern technologies in the region. Last but not least, the formation of strategies and policies to embrace new technology and modern ways of turning and accessing knowledge should be the priority of every university in the region.

## 6.2 Digital Divide and Inequality

Due to the significance of the digital divide and its impacts, this issue is one of the areas that have attracted the highest attention in the research of technology enhanced learning and teaching. Moreover, in the light of the rapid developments in digital technology, the divide is no longer solely about whether people can access the internet and digital technologies (Lewis, 2020). It also includes the access to the latest technology and to develop the skills and knowledge necessary to make use of digital opportunities. This new concept is known as 'digital capability', which does not just mean the ability to use a computer and a software, but also a range of other related skills, knowledge and experience (Stelitano, Doan, Woo, Diliberti, Kaufman, & Henry, 2020). Students and staff with high level of digital capability are those who can benefit and adapt to the changes in teaching and learning, and the new digital practices more effectively (EduTech Hub, 2020). However, developing digital capability requires opportunities for practice in a supportive environment,

but not all students have such opportunities at the moment. This is most clearly evidenced in the context of Southern African higher education, where limited access to digital resources and experiences for some students from disadvantaged background can become a significant obstacle. Such students are less likely to become digitally capable through their studies and may be excluded from the digital society and economy in future.

Such inequality in access to digital resources can also lead to disparity in achievement, in other words students who are digital capable achieve more than those who are less capable. Also, digital inequality can be worsened by other inequalities, for example students from more disadvantaged economic background might not be able to afford the latest digital devices and fast internet at home (Naidoo & Singh-Pillay, 2022), and thus their digital capability may be constrained by the resources available in the institutions only. This suggests that the digital divide can potentially deepen the existing inequality arisen from other factors in the society.

In the context of the digital divide in Southern African higher education, the inequality of access to digital resources between students is among the most widely discussed issues. This is particularly concerning given that universities and other higher education institutions in the region have made, and are increasingly making, efforts to digitalize the learning process, such as introducing a virtual learning environment, online library resources, e-assessment submission and so on (Babane, 2022). However, the efforts to digitalize learning and teaching can inadvertently exacerbate the digital divide. The students who are already digitally capable can benefit more from the digital resources and thus further enhancing their capability (Stelitano et al., 2020); whereas those who are less capable might have the additional pressure to catch up both academically and digitally. The digital divide refers to the gap between people with effective access to digital and information technology, and those with very limited or no access at all. Such disparities usually exist between urban and rural areas as well as between socio-economic groups (Matimaire, 2020). As the world becomes more and more digital, those who are on the wrong side of the digital divide will increasingly be excluded from opportunities to improve their economic and social situation.

## 6.3 Curriculum Development and Adaptation

The curriculum in most African higher education institutions is based on the traditional model of face-to-face instruction. Mutekwe, (2021) observe that contemporary research and advancements in technology are not given priority in curriculum planning and development. Consequently, academics fail to integrate technology into their modules and are often unable to create and design their own courses (Moyo, 2020; Naidoo & Singh-Pillay, 2022). Similarly, students are not provided with opportunities to engage in technological innovations and experimental work (Mukute et al., 2020). The increasing demand for technology integration, which is necessitated by the need for graduates who can function effectively in a knowledge-driven economy, raises a number of challenges in Southern Africa. This, we need to consider the relevant changes and challenges in curriculum development and adaptation in moving towards a knowledge-based society. EduTech Hub (2020) highlighted that curriculum development should not only focus on modernizing the content of programs by incorporating e-learning, but also on enhancing knowledge transfer and acquisition. A total revision

and redesign of curricular goals and content is desirable. This means that the content of a curriculum, the objectives, and the way knowledge is taught and assessed must be scrutinized and aligned to support the modernization of a knowledge society (Moyo, 2020; Maringe & Chiramba, 2022b). Various strategies have been suggested for integrating technological advances and innovations in the curriculum. Before academics embark on e-learning content development and creation, they must first engage in activities that would help inform planned and strategic creation and utilization of e-learning resources.

## 7. Findings and Discussion

The study was a comprehensive literature review, to examine the impact of 4IR on the Southern African higher education context. What became immediately apparent from the discussions are the multiple and competing definitions of the concept of 4IR, in both academic literature and the wider public discourse. However, upon analysis, it became clear that there is a broad consensus around what constitutes the key technological drivers of 4IR, including artificial intelligence, machine learning, Internet of Things, advanced wireless technology, robotics, and 3D printing, and their impacts on various aspects of life and work. This includes the emergence of 'smart' workplaces and communications, new employment and economic opportunities, and fundamental changes in the political and social fabrics of modern societies. While the impact of 4IR on the economy, society, and especially the labor market, has been widely debated and discussed, the implications for education, and in particular for the higher education sector, have not been adequately interrogated, especially with regards to the context of Sub-Saharan Africa. This study also found that there is a tendency among both the academic and practitioner communities to focus on exploring the potential of the technological advances associated with 4IR in 'traditional' disciplines and industries such as manufacturing and computer science, ignoring the emerging cross-disciplinary fields that are created and nurtured by the interactions between different technologies and technological applications. Results from the study suggested that the impact of 4IR on higher education can be encapsulated by its potentials in revolutionizing the way knowledge is produced, accessed, and disseminated, i.e., through innovative pedagogical approaches and cutting-edge research activities, and the way higher education institutions are governed and operated, commonly known as the digitalization of higher education.

Three key opportunities which 4IR can deliver for higher education were identified from the study: innovative and technology-enhanced teaching and learning experiences (for example, adaptive learning and automated assessment), dynamic and multidisciplinary research and innovation environments (such as the emergence of 'technopoles' and research hubs), and enhanced operational and strategic efficiencies in higher education institutions (in areas ranging from effective resource management to data-informed strategic planning). However, it is equally important to recognize the critical challenges that may undermine effective implementation and realization of these identified opportunities. These include the slow pace of change and 'future inertia' amongst higher education communities, the lack of alignment between 4IR-driven innovation and the strategic priorities of both individual institutions and national higher education systems, and the emergence of technological

'elitism' and social and economic divide arising from the unbalanced development and adoption of advanced technology among different regions and social groups.

The 4IR has mostly important implications for those who remain connected around the industrial economy. In addition to the generally positive benefits that the 4IR offers to all, many of the potential concerns may result from a fostering of a bias for the already privileged and thereby exacerbate social inequality which is likely to disproportionately affect the poor. Given that the 4IR is not about a single variable - for example, automation, and as such, different trends or technologies may exert different pressures on the educational system and students in relation to their work as they transition through their lives. Due to the large heterogeneity of regional and national education systems, as well as the different levels of achievement, developmental trajectories of students and different economic and social situation of students, it is likely that the impacts of the 4IR are not uniform in the region and therefore there is no one-size-fits-all assessment. Higher education institutions must not only focus on pure skills delivery but must expand the depth and reach of their training to include liberal skills like creativity, empathy, mental flexibility, critical thinking and social, cultural and ethical values, all of which are important in delivering the humanistic, social and ethical elements of learning.

## 8. Implications and Recommendations

The research findings lead to a series of possible policy implications and recommendations for addressing the identified research challenges. By providing the policy makers and higher education institutions' leadership with useful insights, this study could be leveraged to influence positive changes in the sector particularly in the wake of the impacts of technology on the higher education landscape, associated with the Fourth Industrial Revolution. Firstly, the study suggests that policy makers need to actively advocate for the provision of resources and development programmes to support techno-logical capacity among faculty members within the Southern African higher education sector.

Secondly, the findings highlight that there should be a collaborative engagement among key stake-holders within the higher education sector to not only align the curriculum with the broader societal needs as stipulated in Vision 2030 of most of the Southern African countries, but technology based solutions for improving quality and accessing learning through innovation as well. The study therefore, implies that policy makers and the leadership of higher education institutions should start to foster multi-stakeholder collaboration for innovative, technology-driven approach to quality assurance and accreditation exercises. The study suggests that by reconceptualising quality management in the context of the Fourth Industrial Revolution, and emphasis on "adaptive", "flexible" and "continues improvement" processes as opposed to "compliance" and "auditory" driven traditional quality assurance mechanisms, significant improvements in quality could be realised as we move from "off-line" towards "real-time" and "meta-level" quality control processes associated with the use of Big Data and Machine Learning driven analysis in learning and teaching activities. This would require the policy makers to embark on a progressive review of the current legislative and regulatory framework to accommodate digital transformation within the higher education landscape.

Last but not least, the study suggests that a national forum that could be state initiated under the guidance of the Ministry of Higher and Tertiary Education, Science and Technology Development, with active participations of innovation hubs, industry players and civic societies, should be established. Such a forum would be playing both an advisories as well as assessment roles tasked to spearhead the digitalisation of curriculum through considering state-of-the-art technologies for an inclusive and sustainable development of technological based learning environment within the Southern African countries.

## 8.1 Policy Implications, Digital Divide and Access to Higher Education in the 4IR

However, policy makers and education authorities must also take proactive steps in ensuring that higher education institutions are adequately equipped and prepared for the realities of the Fourth Industrial Revolution (4IR). The study findings implicate the need for flexibility in curriculum development and funding for institutions to develop new and more relevant programs and extended learning opportunities. Also, the outcomes of the study point to the importance of ensuring that at the institutional level, updated and more responsive digital strategies need to be put in place. Digital strategies in higher education should be broad, covering basic ICT and digital use by both students and staff, as well as providing a roadmap for the development of more sophisticated models of digital learning and interactivity. The findings also suggest that there should be significant staff development and resource investment dedicated toward driving digital literacy and exploring innovative pedagogies. Crucially, the study vindicates efforts now being made by the likes of the European Union and Microsoft in establishing digitally driven capacity-building projects for university teaching and research staff across Africa. This initiative and others like it demonstrate the increasing recognition of the need to prepare teaching staff to work under 4IR and also to support the development of a digitally literate generation of new academics, so that as older generations retire this momentum is not lost. I believe that if we can work to address the digital gap between teachers and students now, in the future we will be much closer to truly exploiting the potential of digital connectivity in higher education.

## 8.2 Institutional Implications, Digital divide and Access to Higher Education in the 4IR

In response to the results, the article recognises the need of institutions to respond to these research challenges and suggests that institutional cultures and policies will need to adjust to the fast changing demands of 21st century research. This result will further compound the realities of the fourth industrial revolution and the transformation of the research landscape. There will be distinct stratification in research productivity and impact between the institutions that respond effectively to the societal impact and translational agenda of the fourth industrial revolution in their research institutional strategies and those that are unable to do so. The article recognises the need for institutions to respond to these challenges and to not only equip the individual researchers in terms of enhancing their digital skills and sophisticated use of technology, but also be focused on providing research funds and physical infrastructure to develop laboratories, research and teaching facilities that incorporate

the new technologies of the fourth industrial revolution. Furthermore, it is suggested that enhancing smart partnership and effective collaboration between developed and developing countries and among Southern African countries may help to overcome the digital divide challenges and the transfer of fourth industrial revolution technology from the developed world can provide effective solutions to the research challenges. The result of the currently first wave of big data and technology driven digitalisation of everything around us is vividly shaping a new research landscape in the journey of scientific discovery and the next frontiers of why do we need science and what science has to offer in a new era are closely explored.

## 9. Recommendations for Future Research

First, researchers should explore in more depth the specific research challenges facing higher education described in the paper. This may involve looking at how institutions in Southern Africa compare to those in other regional contexts, or may involve trying to measure the extent of the digital divide through large-scale data collection and analysis. Secondly, opportunities for comparative research should be explored. Experts have noted the unique position of higher and further education in the Southern African context, as facing a dual pressure to respond to the demands of 4IR while simultaneously addressing the huge social and economic disparities which exist in the region. By comparing policy and practices in a range of different global contexts, researchers may be able to develop a deeper understanding of how the challenges and opportunities articulated by 4IR are being negotiated in different kinds of institutional and socio-economic contexts.

Thirdly, and extending from discussing the idea of comparing different global contexts, research should explore the impacts of global interactions and digital networks. This might involve looking at diverse issues such as the development of online learning, the influence of higher education on global economic networks, or the increase in the use of digital tools and international collaborative projects to drive research-intensive agendas. This kind of work might involve going beyond the level of formal teaching and explore the potential of digital education to facilitate and encourage dialogue and peace building and the connections between higher education, the public and policy makers. Finally, exploring the experience and aspirations of students in higher education may be a rich area for future research. As students start to seek higher education opportunities in colleges and universities which will prepare them for lives and careers in a fast-changing digital world, researching the expectations and experiences of students and how institutions are seeking to provide new, digitally enhanced education may provide a relevant and engaging focus for both researchers and the public. By actively involving student communities in research, and by communicating the findings and implications of research to students, it is possible to contribute to the generation of knowledge that fosters deeper understandings and co-operative relationships between students, policy makers and higher education providers in the effort to navigate this rapidly changing landscape. Exploring each of these research areas would provide valuable contributions to our understanding of how 4IR is and might continue to shape higher education practices, policies and the student experience globally and in the unique context of Southern Africa.

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[ About the author ]

**Simon Vurayai** is a senior postdoctoral research fellow in the Ali Mazrui Centre for Higher Education Studies, Faculty of Education, University of Johannesburg in South Africa. He holds a Ph.D. in Sociology of Education. His research interests are, gender studies, social justice, problems in education, sociology of knowledge, sociology of mass media, sociology of development and poverty studies.