



Chapter 9

Social media is in young people's nature: Environmental sustainability, awareness, consciousness and activism during the Fourth Industrial Revolution era

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Abstract

The Fourth Industrial Revolution (4IR) can be defined as an integration of technologies that obscures the boundaries between the physical or real, biological and digital, domains, collectively known as cyber-physical systems. Furthermore, as a result of the COVID-19 epidemic, several elements of the 4IR have been expedited, with social media and digital platforms being examples. Although there is growing recognition that the 4IR has the potential to worsen issues for people and the earth, it also has the ability to alter and realign societies. Several youth movements have emerged to address the environmental and climate change problem. The youth population is a focal point in the discourse surrounding ecological justice, environmental awareness, and initiatives related to climate change. Youth movements throughout the world, such as 'Extinction Rebellion' and 'Fridays for Future' show that young people are concerned about environmental issues and want to get involved in climate change activism. Their desire to act on their own behalf makes them one of the most essential and fascinating groups to learn more about when it comes to the problem of increasing environmental knowledge, consciousness, and action. This chapter aims to investigate the role and influence that social media and 4IR have had and might have on the youths' environmental

knowledge, awareness, conscience, and activism on and within the environmental discourse.

Introduction

The issues of environmental degradation and climate change pose significant threats to sustainable development and the well-being of humanity on a global scale. Beukes (2021) notes that climate change poses a threat to homes, health, and natural resources in South Africa, which are relied upon by many for survival.

The Fourth Industrial Revolution (4IR) encompasses a range of technologies, including artificial intelligence (AI), the Internet of Things (IoT), big data, and cloud computing systems. These technologies have the potential to be widely adopted and integrated throughout society, resulting in significant changes to human life (Saudi et al., 2019:363). The 4IR has arisen and presents a challenge to humanity, alongside the imperative to execute the 17 Sustainable Development Goals (SDGs) outlined in Agenda 2030 for Sustainable Development. The Agenda 2030, as posited by Roblek et al. (2020), seeks to harmonise and interconnect the tripartite facets of sustainable development, namely the economic, social, and environmental dimensions. The Agenda 2030 further mandates that all nations across the globe must embrace and implement the SDGs by the year 2030. The 4IR aims to bring about a transformation in the quality of life, business operations, and management practices that will revolutionise human development and the environment (Saudi et al., 2019:363).

The 4IR is distinguished by the merging of technologies that results in a fusion of the digital, physical, and biological domains, commonly known as cyber-physical systems. Furthermore, as a result of the COVID-19 epidemic, several elements of 4IR have been expedited, with social media and digital platforms being examples. Although there is growing recognition that the 4IR has the potential to worsen issues for people and the earth, it also has the ability to alter and

realign societies, especially with regards to social media and the climate change discourse. Several youth movements have emerged to address the environmental and climate change problem. Young people are at the heart of conversations and acts about (in)justice in the environment, environmental awareness, and climate change.

Youth movements throughout the world, such as 'Extinction Rebellion' and 'Fridays for Future' show that young people are concerned about environmental issues and want to get involved in climate change activism. Their desire to act on their own behalf makes them one of the most essential and fascinating groups to learn more about when it comes to the problem of increasing environmental knowledge, consciousness, and action. This chapter aims to investigate the role and influence that social media and 4IR have had and might have on the youth's environmental knowledge, awareness, conscience, and activism on and within the environmental discourse.

Environmental Issues and the Fourth Industrial Revolution

South Africa has to deal with several natural issues and extreme weather events. In South Africa, the effects of climate change have been especially clear in the last few years (Beukes, 2021:2). Also, more and more people are realising that the 4IR could make problems worse for people and the planet, but it could also change and reshape societies (Herweijer, et al., 2018:2). These authors make a valuable case which I would like to put forward in this section of the chapter.

They (Herweijer et al., 2018:5) argue, for instance, that within AI, the implementation of automation has the potential to result in a decrease in employment opportunities within the service industry and other related sectors, which may contribute to the exacerbation of societal inequality. The rate at which automation is adopted affect the gross domestic product (GDP) share of different industries, potentially leading to increased economic fragility (Herweijer et al.,

2018:5). The utilisation of autonomous vehicles, commonly known as drones, has the potential to result in additional job displacement, particularly for taxi and lorry drivers, as conventional professions become progressively outdated. Moreover, propeller-based drones flying at low elevations can contribute to amplified noise pollution, as noted by Herweijer et al. (2018:7).

They continue with this line of argument when referring to the IoT and state that the proliferation of 23 billion interconnected energy-consuming devices at present is expected to rise to 50 billion by 2020, resulting in a substantial surge in energy consumption (Herweijer et al., 2018:6). To address this issue, energy efficiency must be integrated as a crucial common feature of this extensive network of devices, sensors, and appliances. Additionally, responsible disposal of the augmented number of devices must also be considered (Herweijer et al., 2018:6). Although this line of argument might sound all doom and gloom with regard to the impact the 4IR can have on the environment, Herweijer et al. (2018) still suggest that these factors can be minimised or contained with proper governance policies as the role of governments is crucial in mitigating unintended consequences and promoting responsible and sustainable outcomes in the context of the 4IR (Herweijer et al., 2018:8).

The 4IR aims to revolutionise the development of humanity and the environment by transforming the standards of living, business, and managerial practices. As already mentioned, the concept of 4IR is centred on a unique amalgamation of virtual, physical, and natural progressions (Saudi et al., 2019:363). If this is the case, the question arises, in what ways can we modify these transformations to effectively tackle the most urgent issues faced by society and the planet, without aggravating them?

Notwithstanding the aforementioned challenges, it is increasingly acknowledged that the 4IR possesses the potential to effectuate transformations and reorientations within societies. The Fourth Industrial Revolution, which

is facilitated by digital technology on a global scale, is presently the most rapidly evolving era of innovation. The aforementioned phenomenon is supported by swift advancements in various technologies such as AI, robotics, the IoT, nanotechnology, and biotechnology, among others. The ongoing process of disrupting numerous conventional markets and industries is presently in progress.

With regard to the energy debate within the climate change discourse, technology can contribute positively to a cleaner environment. In the context of the 4IR, the energy sector faces a significant innovation challenge. Specifically, there is a need for technological advancements that can facilitate the development of a modern, clean, and decentralised power grid. This entails the creation of virtual power plants that can aggregate millions, and eventually billions, of emerging renewable energy sources. These sources would be optimised through the use of AI and machine learning, while blockchain and IoT technologies would enable peer-to-peer trading. Advanced materials, such as graphene and nano-solutions, are nearing the point of supporting breakthroughs in battery technology for cost-effective, rapidly-charging, high-energy-density batteries in the field of transportation. The potential market disruption of carbon-intensive internal combustion engines could result in electric cars becoming both cost-competitive and performance-competitive (Herweijer et al., 2018:12–13).

On a similar positive note, the retail industry has the potential to undergo a significant transformation through the integration of technology. This transformation could involve the adoption of virtual shopping systems, point-of-use 3D printing, blockchain, AI and IoT-enabled supply chain transparency and accountability, as well as circular and sharing economy models. Fintech, encompassing technologies such as AI, blockchain, and IoT, has the potential to enhance financial inclusion and decentralisation, promote market integrity, and potentially serve as a precursor to identifying systemic financial pressures, particularly for the unbanked and underbanked populations within the finance industry

(Herweijer et al., 2018:13). Furthermore, Herweijer et al., (2018:13), argue that the urban areas can leverage the IoT and bioengineering to modify their surroundings and incorporate functional systems that optimise lighting, heating, waste collection, and deliveries in response to current demand. Blockchain and AI technologies have the potential to automate planning processes and property developments in various contexts. In addition, according to Herweijer et al. (2018:13), the utilisation of drones, 3D printing, and robots can facilitate the construction of novel multifaceted structures more efficiently and promptly. The aforementioned instances serve as mere demonstrations of the modifications that conventional industries can undergo with the aid of 4IR technologies, which may also result in favourable societal and ecological outcomes.

The concept of 4IR is a relatively new area in the literature and is primarily applied within the context of large corporations that possess significant resources. The importance of technological advancements, strategic operational enhancements, and process automation has been acknowledged, leading to the emergence of the notion of intelligent enterprises in small and medium enterprises (SMEs) (Saudi et al., 2019:364). The pursuit of a sustainable and value-driven economy is driving initiatives aimed at establishing sophisticated networks, implementing computerised innovative startup systems, utilising sensory techniques in agriculture, and introducing automation in physical products for small and medium-sized enterprises. According to Saudi et al. (2019:364), the incorporation of 4IR technologies into the operations of businesses within the nation has the potential to address challenges related to insufficient access to food, clean water, energy, environmental sustainability, and holistic healthcare.

According to Herweijer et al. (2018:2), the preceding industrial revolutions have propelled economic progress, albeit at the cost of environmental degradation. Presently, there is an increasing agreement among the scientific community that the various systems of the Earth are experiencing unparalleled levels of strain. According to Steffen

et al. (2015), researchers at the Stockholm Environment Institute have determined that four of the Earth's nine 'planetary boundaries' have been surpassed, specifically those related to climate, biodiversity, land-system change, and biogeochemical cycles. The escalation of population to an estimated 9 billion by 2050 is anticipated to amplify risks, particularly concerning the augmented demand for food, materials, and energy. Simultaneously, contemporary society is experiencing increasing social and economic pressure due to factors such as rising inequality, unemployment among young people, automation, geopolitical instability, and nationalism (Herweijer et al., 2018:2).

The contemporary global challenges are delineated by the United Nations (UN) 17 Global Goals for Sustainable Development (UN, 2017; cf. Beukes, 2021:3). The SDGs, which were ratified by 193 nations in 2015, offer a comprehensive plan of action for the betterment of humanity and the environment until 2030. At present, there exists a favourable opportunity to leverage the transformative capabilities of the 4IR to facilitate the attainment of societal, governmental, and commercial objectives, rather than impede their realisation. The establishment of enabling mechanisms is crucial for governments and policymakers to ensure the sustainability of the 4IR. According to Herweijer et al. (2018), the advances and financial benefits resulting from the 4IR must prioritise the promotion of favourable social and environmental outcomes while simultaneously preventing the exacerbation of current pressing issues.

Youth involved in environmental issues

Contemporary youth are situated at the forefront of discussions concerning ecological (in)equity, inter-generational environmental awareness, and climate change rhetoric and actions (Beukes, 2021:1). Comprehending the direct impact of the climate crisis on the youth population in South Africa is of utmost importance. The youth will be subject to a notable and tangible physical impact as a

result of variables such as increasing temperatures. This phenomenon has a significant impact on both water security and agriculture. The occurrence of floods and droughts can result in physical harm to infrastructure, such as buildings and roads, while also leading to food scarcity and hunger (Beukes, 2021:2). The contemporary context is marked by the adverse impact of climate change on children and young individuals. As a result, the conventional notion of children being relegated to a passive role has been challenged by the present-day youth (Beukes, 2021:1). The aforementioned statement posits that the younger generation is likely to bear the consequences of greenhouse gas emissions (GHGs), pollution, and other environmental hazards, as per the findings of Chersich et al. (2019:615).

I have argued in various other publications that numerous youth movements worldwide, including but not limited to '*Fridays for Future*', '*Sunrise*' and '*Extinction Rebellion*' have begun to recognise this issue. Furthermore, they have taken measures to ensure that this pivotal challenge remains a prominent topic on the international agenda of diverse political figures, nations, religious institutions, and other relevant entities. Moreover, the younger generation has begun to take on proactive roles as agents of change. This is due to their recognition of the imperative to proactively tackle the climate crisis as agents of resolution rather than as passive recipients of its consequences. Drawing upon Han and Ahn's (2020:2) perspective, it can be argued that the younger generation can be considered as the future environmental caretakers.

There is a growing trend of youth movements and activism worldwide, particularly in relation to concerns surrounding ecology, climate change, and environmental injustice. Greta Thunberg, a youth activist from Sweden, is actively engaged in an ongoing campaign to address environmental injustice and climate change issues in Europe. According to Beukes (2021:4), the '*How dare you*' speech delivered by Greta Thunberg, was directed towards world leaders for their inaction during the United Nations climate

change summit in September 2019. The speech generated opposing viewpoints. The speech delivered by Greta had a significant impact on the worldwide conversation regarding the subject of climate change and its relation to youth, as evidenced by its widespread influence within a few months (Beukes 2021:4). Greta Thunberg's activism pertaining to environmental concerns and the resultant social movement it has generated is a subject of significant scholarly interest. At the age of 15, she made the decision to abstain from attending school on Fridays. She opted to spend Fridays outside the Swedish parliament (Stoecklin 2021:1). The objective of the demonstration was to advocate for more robust governmental measures concerning the issue of climate change. Subsequently, other students emulated her actions and proceeded to participate in the public demonstrations (Stoecklin 2021:1). They initiated a school climate protest movement called '*Fridays for Future*'.

What I further want to highlight is how digital media, social media, technology and the 4IR have played a crucial role in creating awareness and consciousness amongst young people worldwide. Due to this, how the movement has extended beyond the boundaries of a town, country and continent. Since Greta Thunberg's 2018 address at the UN's Climate Conference, there has been a rise in youth opposition globally (Stoecklin, 2021). According to Boulianne, Lalancette and Ilkiw (2020:208), there were multiple coordinated multi-city demonstrations in 2019, each involving over a million students. Such was the influence that a single youth advocate and the 4IR had, hence this chapter investigates the role and influence that social media and 4IR have had and might have on the youths' environmental knowledge, awareness, conscience, and activism on and within the environmental discourse.

Similarly, within South Africa, the South African Youth Climate Movement witnessed a substantial surge in participation and garnered substantial media attention in June 2019 (Mjiyakho et al., 2021). According to Postman and Hendricks (2019), on the 14th of June 2019, the youth took to

the streets in Pretoria and Cape Town, calling for immediate and urgent action from the government in response to the climate crises. The protest that ensued was a sequel to a march that took place on 15 March 2019 and was instigated by the African Climate Youth Alliance. Numerous youths from various regions of South Africa actively participated in advocating for environmental equity. Throughout history, the youth of South Africa have demonstrated a formidable capacity to advance a movement, as evidenced by the work of Booysen (2016).

Similar to the case of Greta Thunberg in Europe, Ayakha Melithafa, a youth climate activist hailing from the Western Cape region of South Africa, has garnered significant attention, as reported by the World Economic Forum (WEF) in 2020. Her contribution to raising awareness about the notable climate issues in South Africa has been noteworthy. She also gained attention for her participation alongside Greta Thunberg and other global teenagers in a petition to the UN Committee on the Rights of the Child. The petition aimed to hold five of the world's most influential economic powers responsible for their lack of action in addressing the climate crisis, as documented by UNICEF (the United Nations Children's Fund) in 2019. Ayakha Melithafa participated in the World Economic Forum held in Davos, Switzerland in January 2020, where she shared the platform with Greta Thunberg (cf. WEF, 2020:3). Melithafa together with the South African youth were calling for governmental recognition of the existence of a climate crisis. Additionally, they advocated for an abrupt termination of coal, oil, and gas extraction in South Africa.

The youth and the Fourth Industrial Revolution

The emergence of the 4IR ought not to be misconstrued as a complete negation of the significance of human labour but should rather be regarded as undergoing an evolutionary transformation (Saviotti & Metcalfe, 2018). A study conducted by Mhlongo and Ssemugabi (2020), investigated the readiness of South African youth (aged 18–35) in relation to the 4IR. The study revealed that a significant proportion of the youth

participants in the sample were able to operate a computer without requiring assistance. Furthermore, it has been determined that the digital literacy proficiency of young individuals is situated at a level of literacy that enables them to perform routine tasks utilising any type of computing device. Overall, the majority of participants in the survey exhibit proficiency in traversing websites with varying content and evaluating online information with a critical eye rather than accepting it at the surface level. According to Mhlongo and Ssemugabi (2020:138), the respondents demonstrated e-skills that were marginally higher than the average level. This implies that the younger generation has a moderate level of preparedness for the Fourth Industrial Revolution in terms of their digital literacy and e-skills.

Moreover, the utilisation of social media platforms appeared to be widely favoured among the youth participants. Participants were requested to indicate their frequency of use for 10 social media platforms, including WhatsApp, LinkedIn, Facebook, Instagram, Snapchat, Pinterest, Twitter (now called X), WeChat, Viber and YouTube, using a scale with three possible values ranging from 0 (Never) to 2 (Always). The findings of the study revealed that WhatsApp emerged as the most widely utilised social media platform, with all participants reporting having engaged with this particular platform. Moreover, the participants reported that they consistently utilise Facebook (72.2%) and WhatsApp (88%). Conversely, a significant proportion of participants reported that they do not utilise LinkedIn (69.4%), Pinterest (70.1%), WeChat (73.1%) or Viber (95.4%). The findings of Mhlongo and Ssemugabi's (2020) study reveal that a significant proportion of participants reported using YouTube (64.8%) and Twitter (73.1%) on an occasional basis. The findings derived from this segment of the research investigation suggest that the participants commonly integrate social media platforms into their daily routines. As a result, it can be inferred that social media usage is prevalent among the respondents.

The role of the Fourth Industrial Revolution and social media on environmental awareness

In general, social media platforms are effectively contributing towards the advocacy and implementation of diverse environmental concerns. Robelia et al. (2011) assert that social media platforms are highly active with regard to topics such as global warming, renewable energy, climate change and solid waste management news, with a significant number of individuals, particularly the younger generation, participating in these discussions. The advent of technology has enabled individuals to modify their actions and engage in environmentally sustainable practices. However, despite these advancements, individuals have failed to keep pace with the rapid environmental changes occurring both locally and globally due to the uncontrolled exploitation of natural resources. The utilisation of social media has emerged as a significant mechanism for enabling public engagement in shaping or negating environmental policies implemented by governmental bodies and corporate entities that have far-reaching implications. Warner et al. (2014) have established a platform that enables individuals to engage with regional environmental issues and comprehend their implications on a global scale.

The use of social media has become a crucial means of marketing and communication for various entities such as government bodies, youth movements, public and private organisations, NGOs, autonomous bodies and other institutes, worldwide. This platform serves as a tool for promoting their organisational mission, vision, publications, events, actions, and initiatives. Individuals frequently utilise social media platforms to disseminate real-time photographs of diverse environmental concerns, including but not limited to water, air, soil, noise, solid waste pollution, chemical or oil spills in waterways, forest fires, plastic pollution, illegal dumping, and the impact on flora and fauna. The expeditious detection of an environmental occurrence and the timely intervention of relevant environmental agencies can be facilitated by

a straightforward, yet efficacious measure (Arbatani et al., 2016).

The younger generation demonstrates an aptitude towards technology. Therefore, the significance of modern technology and social media platforms should not be underestimated. Social media serves as a valuable platform for the youth to exchange information and promote awareness of pertinent issues. In South Africa, it has been effectively leveraged to advance the climate justice movement. Numerous adolescents have gained knowledge and awareness regarding the environmental crisis and its ramifications through online browsing and engagement on social media platforms. Social media platforms are utilised more frequently by young activists to exert influence on other disengaged youth (Beukes, 2021:6).

Conclusion

In my prior publications, I have posited that while there has been a surge in youth advocacy, it is imperative to recognise the lack of youth representation in global politics. However, despite their significant representation in the population of several nations, particularly in Africa, the youth are frequently excluded from environmental and climate change policy formulation and implementation. The individual exhibits a growing sense of social and environmental consciousness and possesses the capacity and vigour to significantly transform our communities towards a future that is both low-carbon and resilient to climate change. This chapter bolsters my prior contention to a greater extent, as the 4IR is advancing at an accelerated pace propelled by exponential computational capabilities, the internet, mobile infrastructure, and worldwide competition. In contrast, it is common for governance structures to operate at a slower pace, utilising more traditional and manual methods. Hence, there exists a possibility for the delay of governance, policy, and regulation in keeping up with emerging systems, industries, and solutions within the context of the 4IR. However, while

government delays, the climate crises increase. The younger generation, possessing advanced technological expertise and proficiencies, is optimally situated to contribute to governance, leadership frameworks, and communities.

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