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Future-fit leaders for future-fit schools: Principal narratives of leading rural primary schools for 4IR imperatives

Abstract

The digital divide and the low socio-economic status of many South African school communities, including rural Limpopo, the site of this research study, created an immediate and urgent need to transform teaching and learning during the unprecedented Covid-19 global pandemic. Within this context, this study demonstrated the importance of technology and digitisation in building future-ready schools. The literature study clarified the requirements of a neuroleader as a future-fit leader and used the theoretical framework of neuroleadership to define and explain future-fit leadership. Insights for this article were derived from 10 school leaders in rural Limpopo primary schools. The data was collected using WhatsApp voice notes, which were converted into narratives for each of the principals. Digital stories of each school were also used. The phenomenological approach was adopted to better understand the lived experiences of these principals. Thereafter, the data was analysed using thematic analysis in order to identify themes or patterns in the narratives. The main findings emphasised the necessity of neuroleadership in a future-fit leader. Finally, more research is required to investigate the idea of creating entirely digital rural schools with a rotating schedule that alternates between days of in-person instruction and days of online instruction.

Keywords*: digital skills; future-fit leadership; future-fit schools; fourth industrial revolution, rural schools*

1. Introduction

Education is a way to prepare learners for the future (Coombe, 2019). To make us future fit, education has a special and crucial role to play (Smitsman, Laszlo & Luksha, 2020). According to Coombe (2019), education provides learners with the knowledge, skills and tools needed to succeed in the workplace. Consequently, to manage the Covid-19 pandemic, school leaders had to use fourth industrial revolution (4IR) imperatives to transform the way they were leading.

The study aimed to understand the types of future-fit leadership techniques used by school leaders that

created future-fit schools in Limpopo's rural primary schools. The 10 principals who were the participants in the study, were members of the National Education Collaboration Trust (NECT) Sandbox Project prior to Covid-19. The National Education Collaboration Trust (NECT) is an organisation which is dedicated to strengthening partnerships between society and government with the purpose of achieving South Africa's nationwide goals for basic education (National Education Collaboration Trust, 2019).

The NECT is based on the principle that collaboration and focused effort by important role-players increases our power as a nation to secure the changes we urgently need in order to deliver quality education to all our children. The NECT's point of departure is that the government and civil society have different but complementary roles to play in relation to education (Volmink & van der Elst, 2017: 11.)

Eleven schools in underprivileged communities are involved in the multi-year NECT Sandbox Project. Ten of these schools are located in the rural Limpopo region and one is in Soweto. These are all quintile 1-3 schools. The National Norms and Standards for School Funding (Republic of South Africa, 1996) uses a ranking system called quintiles to categorise schools. This quintile scheme was designed to provide equity in school financing, and it places each school in one of five quintiles to accomplish this improvement in equity with quintile 1 being a no-fee school and quintile 5 being a school with higher school fees (White & van Dyk, 2019). The low socio-economic status of parents in rural areas places learners at a disadvantage (du Plessis & Mestry, 2019: S1). This research sought to understand how rural primary school principals in Limpopo used 4IR imperatives to lead the development of future-fit schools.

Future-ready leaders are those who can adapt and innovate in the face of disruption and who value and embrace diversity (Factor10 Consulting, 2019; Smitsman *et al*., 2020). These leaders also use their skills and capabilities to ensure that learners are equipped with 21st-century skills (Tan *et al*., 2017) to sufficiently prepare them for the future (Schönwetter *et al*., 2020). An effective and successful school or education system can develop future-ready individuals who will continue to study beyond graduation, seek future life employment opportunities and thrive in a society and environment that are constantly changing (Seong, 2019). According to Ledwaba (2020), the Member of the Executive Council (MEC) for Education in Limpopo Province states that a lack of development and poverty are the most significant factors that contribute to the poor results. Statistics from Stats SA's 2018 General Household Survey revealed that at least 91,2% of learners in Limpopo, including the schools in this study, depend on school nutrition programmes. Learners in rural areas do not have the same advantages as learners in urban areas because of the low socioeconomic status of their parents (du Plessis & Mestry, 2019). Therefore, the aim of this study was to understand how Limpopo's rural primary school principals guided the creation of future-fit schools that are compatible with the 4IR imperatives.

In order to achieve this aim, this article will begin by explaining the theoretical framework which frames this study. Thereafter, the literature review will give a deeper understanding of existing research as it relates to this study. This is followed by the research design and methodology. Next, the findings of the study are explained, followed by a discussion of the findings and the possible limitations of the study. The article ends with the conclusions which can be drawn from the data.

2. Theoretical framework

The i4 Neuroleader Model, developed by Sylvia Damiano in 2009 for the 21st-century leader, is a neurobiologically based personal leadership model that provides the theoretical framework for this study. This approach takes into account how the brain and body interact with leadership and management, using neuroscience to demonstrate how the brain may function more effectively. Four essential qualities make up the i4 Neuroleader model: performance, collaboration, innovation and agility (McLennan, 2015). This leadership approach supports leaders in improving their capacity for performance (*@aboutmybrain*). To manage groups, they should also create cooperation frameworks that are adaptable enough to accommodate the constant change in those groups (Bagwell, 2020; Worley & Jules, 2020). Agility is required to integrate strategy and implementation in trying out new and innovative techniques (Dhir, 2019) and innovation should be employed to decide where and how growth can and should occur (*@aboutmybrain)*. Table 1 below gives a graphic representation of the i4 Neuroleader model.

Table 1:   The i4 Neuroleader Model (McLennan, 2015)

Performance	Collaboration	Innovation	Agility
Integration of body and mind Balance – rest, exercise, work Ethics and Values Mental Readiness	Inspiration Communication Generosity - Thinking beyond self Courage - Fear management	Imagination – Generation of Ideas Resilience and Determination Curiosity and Eagerness to learn Attitude - Positivity, Embracing change	Intuition and Decision making Awareness and Mindfulness Influence - Personal power and Respect Adaptability - Versatility

3. Literature review

We were able to gain a deeper understanding of the 4IR in future-fit education and rural primary school leadership, including leadership styles and challenges, through the literature review. This section begins with a discussion of future-fit education, which includes future-fit leadership and the role of future-fit leaders as well as future-fit schools, future-fit learners and future-fit learning. This is followed by a discussion of the fourth Industrial Revolution (4IR) and the opportunities and challenges that it brings for education.

3.1 Future-fit Education

We are currently living in what has been dubbed the Creative Age, the Digital Age, the Conceptual Age (Tan *et al*., 2017) and the Imagination Age (McLennan, 2015). According to Roddie and Thomas (2020), the future is uncertain, and it involves novel realities that vary depending on the context (Seong, 2019). The future is not some moment in the future; it is happening right now, every day (Schönwetter *et al.,* 2020). Therefore, future-fit education is education that can prepare learners to cope and be productive in this creative, digital and imagination age, as well as in the future.

3.2 Future-fit leadership and the role of future-fit leaders

A successful education system will produce learners who are capable of contributing positively to society in the future (Smitsman *et al*., 2020). If learners cannot translate their academic talent into the skills and knowledge required for jobs in the future, then their academic ability

is worthless (Seong, 2019). A future-ready leader must take initiatives that will contribute to the institution's expansion (Smitsman *et al*., 2020) to ensure that the different parts of the institution are learning and developing in order to keep abreast of the rapid changes in technology (Hawkins, 2017). This calls for a shift in the leadership style of the institution that promotes innovation and collaboration (de Smet, Lurie & St. George, 2018). Future-ready leaders must be role models who can collaborate with and motivate the upcoming generation of leaders through partnership, listening, challenging and motivating them in addition to providing mentoring and coaching (Hawkins, 2017). A future-fit leader recognises the skills and abilities within the organisation (Hawkins, 2017) and assists everyone to grow to achieve organisational objectives and deal with the challenges of the 21st century (Mestry, 2017). Leaders must be able to draw on their own values and views as well as those of others (Schönwetter *et al*., 2020). A school principal's primary duties include "supporting and fostering the progress of others", especially the teachers, and leaders must also put their own health and well-being first (Sterret & Richardson, 2020: n.p.).

3.3 Future-fit schools, future-fit learners and future-fit learning

With the increased relevance of information and communication technologies, schools must prepare educators and learners to be successful participants in the knowledge society (Zagami *et al*., 2018). We are living in the age of a technological revolution that is constantly changing our lives, our work and how we relate to each other (Schwab, 2016). Therefore, we must switch our attention from a labour and resource-based economy to a knowledge-based economy (Rodny-Gumede, 2020). The necessary abilities and skills are no longer industry- or role-specific but pertain to abilities and skills that can be transferred and that centre on the four C's: "Critical Thinking, Collaboration, Communication, and Creativity" (Rodny-Gumede, 2020: 57). To tackle problems creatively, one must learn to think outside the box and experiment with fresh strategies and viewpoints. An efficient and effective education system creates people who are future-ready and who will continue to learn after graduation, contribute favourably to the economy and prosper in a constantly changing environment. Therefore, individuals should seize opportunities to advance their knowledge and abilities and organisations should implement policies and programmes that encourage employee learning (Walker & Boyer, 2020). Learners must be equipped with "technology, linguistic and human skills, cultural readiness and ethical values" (Amihan, 2020: 1151) to be adequately prepared for the 4IR. Through case studies, virtual or game-based learning, situated project-based learning and service learning, they may be exposed to the actual world while studying (Walker & Boyer, 2020). Organisational development, leadership development and human resources should all be combined to make an organisation future-ready (Hawkins, 2017).

Figure 1: Future-fit education and the 4IR (Hawkins, 2017).

3.4 Fourth Industrial Revolution (4IR): Opportunities and challenges for education

The capture, storage and transmission of energy, new computing technologies, biotechnologies, neurotechnologies and space technologies are just a few of the technologies that power the 4IR (Mhlanga & Moloi, 2020). According to different scholars (see Ayentimi & Burgess, 2018; Kaggwa & Sithole, 2019; Kayembe & Nel, 2019; Oke & Fernandes, 2020; Schwab, 2017; Sheninger, 2019; Twinomurinzi, 2019), the 4IR involves different technologies, namely digital, physical and biological systems which merge together to work as one. Mobile devices, social media and cloud storage, which have contributed to the creation of an effective computer environment (Alghamdi, 2021), can be used for furthering education. Schools must prepare teachers and learners for successful participation in the knowledge society as a result of the rising relevance of information and communication technology (Zagami *et al*., 2018). To adapt to the 4IR, school leaders must maintain a commitment to education and encourage others to think creatively in order to find novel solutions (Bagwell, 2020). To do this, they should promote cooperation and the exchange of technological expertise (Pangaribuan *et al*., 2020). The fact that not all teachers are equally knowledgeable about and confident in using technology in their instruction presents a challenge for education as technology development and implementation also take time (Pascaris *et al.,* 2021). Another serious problem is that of poor internet connectivity because of poor infrastructure (Dube, 2020; Mhlanga & Moloi, 2020). As a result, any institution will benefit from understanding the 4IR and adjusting to the changes it brings as well as aiding in the development of the students and teachers of the future.

4. Research design and methodology

This study employed the phenomenological research approach. Phenomenology is employed to give a deeper understanding of a phenomenon which has been a common experience of several people (Creswell & Poth, 2016). Narrative research falls within the realm of social constructivism in the interpretive paradigm and it explores the experiences of individuals and how those experiences are impacted by their environments (Haydon *et al*., 2018).

The site of this study was rural Limpopo and it formed part of the Sandbox Project. A sample of 10 principals from rural, low-quintile primary schools was chosen from the population of over 2 000 rural schools in Limpopo. These principals could provide an understanding of how 4IR imperatives could be implemented in school communities where poverty, unemployment and other social ills create an equity divide.

In phenomenology, criterion sampling is used, which means that the participants must meet predefined criteria and have experience with the phenomenon under study (Moser & Korstjens, 2018). For the purposes of this study, 10 school principals who were already research participants of the NECT Sandbox Project were asked to be a part of the study. Criterion sampling was used because these school principals had already committed to being research participants as part of leading a 4IR culture of learning, which is the larger project that this study contributed to. There were seven female principals, one female deputy principal and two male principals. Their ages ranged from 49 to 62 years of age. Their years of experience as school leaders ranged from 7 months to 30 years.

All ethical considerations were observed in collecting data. Approval was obtained from the relevant authorities. Ethical clearance approval letter number Sem 2-2021-015 was issued

by the University of Johannesburg before data collection. Approval was also obtained from the Limpopo Department of Education with reference 2/2/2 before the commencement of data collection. Additionally, all the participants signed written consent letters before participating in the study. The 10 principals were then labelled Principal A to Principal J to protect their identities. Principal 11 is not located in the Limpopo province and could therefore not be included in the study.

A qualitative research methodology was used to identify the types of future-fit leadership methods that school leaders used that led to future-fit schools in Limpopo's rural primary schools. A characteristic of narrative inquiry is that there are usually many meetings between the researcher and the participants (Haydon, Browne & van der Riet, 2018). Due to the Covid-19 safety protocols, data was collected during two meetings using the Zoom platform. The first meeting was to introduce the author to the research participants. The second meeting was for the purpose of data collection, and it was during this meeting that the research questions were asked. Ten Limpopo primary school principals sent voice notes on WhatsApp in response to the study's research questions. Narratives and digital stories were produced from their answers to the research questions. Narratives are a way of using language to depict reality (Foxall *et al*., 2021). The principals each responded to 5 research questions. Due to Covid-19 restrictions, instead of conducting 10 interviews, I had a meeting with the principals via Zoom for the purpose of data collection. During the meeting, I asked each research question and gave them time to respond via WhatsApp voice notes before proceeding to the next question. Thereafter, I was able to transcribe the responses into narratives of each principal's experience, using their voice note responses to each of the research questions. Creating stories allows the researcher to create a narrative that is reader-friendly and easier-to-understand and one that can answer the research questions more accurately (Ford, 2020). The narratives were sent to each principal to read and approve, to ensure that the author had accurately captured their stories. Each principal also created a digital story which gave an audio-visual explanation of what they had explained in their voice note responses.

Following data collection, the narratives were categorised and thematically analysed to identify the main themes and sub-themes. Thematic analysis was used to identify themes and patterns in the narratives (Maguire & Delahunt, 2017). Thereafter, these were analysed and interpreted to make sense of the data. The WhatsApp voice notes were saved automatically and are stored together with the narratives and digital stories in a OneDrive folder for future reference.

5. Findings

This study aimed to understand the types of future-fit leadership techniques used by school leaders that created future-fit schools in Limpopo's rural primary schools. Neuroleadership theory was adopted, determining the relevance of a neuroleader as a future-fit leader in the creation of future-fit schools commensurate with 4IR imperatives. McLennan (2015) identifies four competencies of a neuroleader, namely performance, collaboration, innovation and agility. The findings led to the discussion of three themes. These are firstly, the importance of a neuroleader as a future-fit leader. The second theme is future-fit education and the 4IR, and the third theme is rural school leadership in a time of crisis.

Theme 1: The importance of a neuroleader as a future-fit leader

This study showed that in order for these 10 school leaders to manage their schools effectively during an unprecedented crisis, they needed to improve both their physical and emotional well-being. These leaders also learnt that strong communication among all their stakeholders helped their leadership be more effective. They had to be creative, especially in improving their own and their teachers' skills, and in getting their schools ready to follow Covid-19 protocols. Agility, versatility and adaptability were required to achieve success. Performance refers to mental acuity, morality and a healthy balance between the body and the mind (McLennan, 2015). School leaders must be flexible and continuously prepare themselves mentally, physically, and emotionally to lead their schools, regardless of the circumstances. *These are some of the findings related to the question: How did Covid-19 impact your school?*

> We gave each other ideas and assistance so that schools who were struggling could perform activities in ways that were safe and healthy (Principal F).

> The pandemic taught us to be accountable, compassionate, and loving ... allow educators to connect and share ideas to deal with the family trauma, financial challenges, as well as social and mental instability (Principal C).

Collaboration refers to how leaders collaborate both within their institutions and with other schools in their regions. It also refers to how leaders lead, inspire, motivate, encourage and communicate (McLennan, 2015) to lead across boundaries. As a result of increased communication during the Covid-19 pandemic, it was possible to continue teaching and learning, and networking and coordination among the schools made it possible to maintain accountability and uniformity.

> Because teachers are sharing their expertise and resources with one another as a result of the pandemic, teamwork has been strengthened (Principal D).

> Educators were encouraged to use the school's digital devices to prepare teaching and learning activities together. This created a community of practice – one that will grow and, in many ways, bring teachers together towards a common purpose (Principal F).

> We had team teaching, which improved teamwork within the school (Principal G).

Innovative leaders are very supportive and use intellectual stimulation (McLennan, 2015) to push themselves to try different solutions. Therefore, when problems arise, the leader creates an awareness of the problem and allows others to share their knowledge and expertise. During the Covid-19 pandemic, educators were encouraged to use their knowledge of ICT to assist with solving problems such as communication and the improvement of their facilities. The upgraded facilities ensured the safety of the educators and learners and also helped to provide uninterrupted internet access. These are some of the responses to the question: *What innovations did you and your team embrace during the pandemic?*

> We were successful in modernising the kitchen facilities, where we added equipment to guarantee the food kept there is clean. ... We gave carts to the mother helpers who provide lunch to the students (Principal D).

> We also purchased laptops for each educator which enabled them to attend virtual meetings and workshops and type their tasks (Principal G).

> We realised that we needed a photocopy machine, so we got one (Principal I).

The ability to inspire people to be adaptable in order to better a situation is referred to as agility (Bagwell, 2020). These principals had to be flexible and agile in their leadership of their schools during the unexpected global pandemic.

> We learn*t* to take control of the problems, as and when they arose by having the agility to think creatively and understand each obstacle as it presents itself (Principal A).

> I had to undertake a lot of on-the-job learning mostly due to a lack of expertise in dealing with a pandemic. We had to adapt to a sense of urgency with relation to lesson preparation, duty distribution, timetabling and networking such as instant messaging (Principal D).

> We had to adapt to the rotational system (Principal H).

Theme 2: Future–fit education and the 4IR

Future-fit leadership and the advantages of technology

Future-ready learners who are well-equipped to compete globally are created by future-fit schools using the 4IR (Zagami *et al*., 2018). This entails having leaders who are prepared for the future and who can assist in the growth of their teachers. A future-fit leader is always adaptable, agile and prepared to lead, no matter what situation may arise. This is how 3 of the participants responded to the question: *How did the crisis that the pandemic brought impact your leadership? What did you have to change or adapt to?*

> As future-fit leaders, we must be able to turn our situations around based on the evolving circumstances by altering our duties, our expectations, procedures, as well as operational practices (Principal A).

> We have also become more accountable in everything that we do" (Principal C).

> A future-fit leader "needs to keep abreast with the latest trends and changes, move with the times and continually do research…There was no way that, as a leader, you can continue leading your school the way that you lead before the pandemic" (Principal D).

Virtual meetings and electronic communication

Schools had to create ways to hold staff meetings remotely or online (Houston, 2020; Simamora, 2020), as they could no longer be held in staff rooms. They coordinated all the necessary adjustments through online meetings.

> We had started holding meetings online. Because it was not possible for us to physically meet, we had to learn everything through virtual meetings and training (Principal I).

> Holding staff meetings virtually was another important innovation (Principal D).

The principals had to come up with creative ways to communicate while also maintaining the safety of their teachers and students; therefore, they adopted the use of digital tools.

> Installing a PA (Public Announcement) system to use for assemblies and announcements forced me to fast-track my method of using the ICT for communication, addressing the school, and conveying messages (Principal D).

> For contact with parents who have cell phones to be able to obtain information from the school, we also set up a Facebook profile (Principal J).

> We also created WhatsApp groups for the teachers and parents (Principal G).

Improved skills

The pandemic, which prompted schools to close to enforce social distancing, also made principals responsible for leading their schools into the 4IR. Teachers were forced to learn how to use laptops and smart boards.

> Because of Covid-19 protocols, ICT literacy has been accelerated and improved among educators because it was risky for the educators to touch each other's devices, so everyone has to learn to do everything on their own, instead of relying on one person and using the same resources. … There was a need to fast-track staff developmental programs so that the staff can move and keep up with the changes in technology (Principal D).

> In order for me to effectively implement the school's digitisation strategy, teachers were workshopped and trained on how to connect the laptops as they were not accustomed to doing so (Principal F).

> The teachers are also keen to learn independently and to create methods to help the learners to become learners who can compete worldwide in terms of the 4IR (Principal A).

The 4IR and the digitisation of schools

Each principal developed a unique strategy for integrating ICT and digital devices. For the benefit of their students and their schools, they all discovered creative ways to guarantee that their educators were properly prepared and knowledgeable.

> The students cannot be taught in the manner that was used before, thus the school had to acquire 4IR tools and resources. I realised it was time to take the school into the 4IR and to start teaching digitally when the teachers set up WhatsApp groups for their lessons to allow the learners to submit their work to the school (Principal D).

> The pandemic encouraged most of them to get more involved in using technology (Principal E).

> We are working to establish a digital school in the future. All the teachers now regularly use the whiteboards and projectors, which were not used before (Principal A).

The schools discovered ways to train more of their teachers in the use of digital tools. They came to understand that it is beneficial to use technology to enhance learning. Principals urged teachers to send homework assignments and communications to parents via Facebook and WhatsApp and they came up with inventive strategies to keep the students engaged in their studies.

The challenges of technology

Although digitisation assisted many schools to continue operating there were also many difficulties. The primary issues were that of being unprepared, a lack of data and slow internet connections. A lack of technology was another issue as many of the parents could not afford smartphones and other digital devices because of economic circumstances.

> We have issues with network coverage during virtual meetings. Due to the inefficiency of the bad network connection, the school's performance suffers when we are unable to hear what has to be done during virtual meetings (Principal B).

> Some parents did not have internet connection because of their diverse socio-economic circumstances, making it difficult for them to respond to messages from the school (Principal D).

Theme 3: Rural school leadership in a time of crisis

Dealing with the unexpected

The findings showed that resilience and a desire to succeed under any conditions are the major traits that promote school leadership. The 10 school leaders were completely unprepared to deal with a pandemic that forced a strict lockdown and the closure of schools.

> We were caught off-guard (Principal D).

> It was a situation that we were not prepared for (Principal I).

> We never knew what to expect each day (Principal E).

Despite being taken by surprise, these leaders decided to be tenacious, inventive and critical thinkers. As a result, they were better able to oversee their schools and make sure that classes could resume as soon as it was possible.

Barriers to the success of school leadership

There were many challenges, barriers and hindrances to successful school leadership during the unprecedented crisis brought about by the Covid-19 pandemic. These are the findings related to the question: *What challenges did you experience as a leader during the pandemic?*

One barrier was the Department of Basic Education (DBE). In these 10 schools, many challenges were brought on by external forces. The research showed that the DBE was one of the issues preventing effective school leadership because their support during this crisis was inconsistent. Some principals had very little support while others felt overwhelmed and overburdened by the volume of instructions they were given.

> The directives from the DBE left me feeling overburdened and getting communication from the Department of Education telling me what to do and informing and advising me what to do was too much for me as a leader (Principal D).

> We did not receive any support or visitation (Principal A).

> Unfortunately, during this time of crisis, when teachers with comorbidities applied for leave, the approval did not come in time, and some did not get approval at all. We were told to make requests and apply based on the needs of the school, but we have not received the approval, the extra teachers, or the extra classrooms as yet. There were no replacements for the teachers who were on sick leave. The Department did not take this into consideration (Principal I).

> There were no replacements for educators with comorbidities (Principal G).

Another barrier was poor infrastructure and lack of resources. Communication difficulties resulting from inadequate infrastructure were another problem. Schools also did not have enough furniture to accommodate social distancing. Additionally, not all the parents could respond to messages from the schools.

> Digital communication with the school stakeholders who were at home became a challenge because some of them did not have access to digital devices (Principal F).

> We experienced overcrowding in classrooms, especially in August when all the learners were phased in. ... We did not have enough classrooms at our school (Principal G).

> There was a lack of resources such as space to accommodate all the learners and maintain social distancing when they all had to return to school. There was not enough furniture to support social distancing because some of the furniture was broken (Principal D).

Additionally, it was a challenge to change daily practices and routines, but schools had to change how they operated from day to day.

> All of the school's activities had to be reorganised and some of them were forbidden. Adapting to social distancing is a lifestyle adjustment (Principal I).

> Our lifestyle and habits changed too because all students, teachers, and support staff are required to often wash and sanitise their hands. Social distancing must be enforced (Principal G).

> The students in grades R-3 leave the building first, followed by those in grades 4-7 (Principal D).

The rotational timetable was also a challenge to all the principals. The rotational method required that the students remain at home on alternate weeks and continue to do their work under their parent's supervision while still completing the curriculum.

> The parents were not sure when their learners should attend school and learners also faced uncertainty because they were no longer following the timetable as expected. Closing the school for days due to Covid cases made it very difficult for the educators to cover the curriculum as expected (Principal F).

> It was also confusing for everyone at school. The teachers had to repeat activities two or three times. This was difficult because the methodology, the energy and the flexibility were not the same the second and third days as it was the first time (Principal J).

> *A lot of content was not covered because of the rotational attendance of the learners (Principal G).*

Another challenge was communication with stakeholders. Being limited to digital communication made it challenging for some to keep parents informed (Mukuna & Aloka, 2020) of changes and give them key information like the rotation timetable, the dates their children should be at school and how to follow Covid-19 regulations.

> Communication is the key that had to be looked at and worked on, and we wondered how we would communicate with the stakeholders, with the parents, with the learners and even with the department … when we phoned the parents, we could not always reach them (Principal I).

> We had compromised contact with stakeholders. There were no longer any parent meetings and there were fewer curriculum meetings (Principal G).

> I saw it as a primary need to create a system of communication but digital communication with stakeholders who were at home became a challenge because some of them did not have access to digital tools (Principal F).

Last, the challenge of poor attendance worsened. Attendance has always been a challenge for these rural primary school principals. However, it worsened and even resulted in some learners dropping out (Shepherd & Mohohlwane 2021) of school during the Covid-19 pandemic.

> We also had a high rate of absenteeism from both educators and learners, and we also had Covid cases which delayed attendance. We had poor learner attendance due to ill health and poor teacher attendance due to comorbidities (Principal C).

> What made it worse is that when it was their week of the rotation to be in school, and their friends from other schools did not have to be in school for that week, then they were influenced to stay out of school due to peer pressure (Principal J).

> There were a high number of educators on sick leave. There were no replacements for educators with comorbidities. We also experienced a shortage of support staff (Principal G).

The fifth research question was a general question which allowed the participants to mention anything else related to their leadership experiences during the Covid-19 pandemic.

6. Discussion and recommendations

This study aimed to investigate how 10 school principals were able to exhibit future-fit qualities that supported the formation of future-fit schools in environments with severe resource shortages. The future-fit leadership techniques used by these school leaders to support instruction and learning (Smitsman *et al.*, 2020) during the pandemic were revealed in this qualitative study of their practices. The findings from this study may assist in the development of future-fit schools led by future-fit leaders in other rural areas. Even though these principals were unprepared for the strict lockdown and the shutdown of their schools, they employed creativity (Rodny-Gumede, 2020) and improved their digital literacy to ensure that instruction could continue (Mhlanga & Moloi, 2020). The study also clarified how important it is for school leaders to keep abreast of the most recent technological advancements in education and to make sure that their staff members are proficient in the use of technological devices (Dube, 2020).

The need for principals and educators to be more mindful of their health and well-being was highlighted too. Mahfouz (2018) states that leaders with emotional stability are necessary in order to create a healthy, positive school culture. This study also made the case that in order to reduce the high absence and dropout rates among learners and educators (du Plessis & Mestry, 2019), educator and learner well-being (Wessela & Wood, 2019) needs to be addressed. There was a significant contribution from all the participants in which they explained and described their future-fit leadership strategies for the development of future-fit (Seong, 2019) rural schools in Limpopo. Although most of their narratives were similar, their characteristics and circumstances were different. However, to create and develop future-fit schools with future-fit educators, future-fit learners and future-fit leaders, there is a need for effective programmes to be put into place and adhered to. The needs of individual schools should be taken into consideration when creating these programmes. These needs could relate to digitisation, improving infrastructure (Mhlanga & Moloi, 2020), or the training of teachers in the use of online learning platforms (Dube, 2020). They should be well planned, managed, and implemented. The planning should be done by the school management teams (SMTs), in collaboration with the department of basic education (DBE). Committees should also be selected by each of the schools to lead and be accountable for the planning, management, and implementation of the programmes.

7. Possible limitations

The main author's inability to visit any of the schools as a result of Covid-19 travel limitations was a study drawback. We had to use Zoom meetings, where the attendees struggled with connectivity and punctuality problems. However, the study was not negatively impacted thanks to the 4IR. Email, Zoom and WhatsApp are all online tools that helped keep the study on track. Principals struggled to communicate their answers through WhatsApp voice notes because they were attending the Zoom meeting on the same smartphone, which caused connectivity challenges. Then, once the Zoom meeting concluded, we improvised by sending the questions via WhatsApp and having them send their voice notes as soon as they could. This compromise had one drawback because some participants were tardy in sending their voice notes. Some principals gave numerous short voice notes rather than only five lengthy responses because they were unsure of how to send voice notes. Even if some voice notes were longer and more detailed than others, the shorter responses were still informative.

8. Conclusion

All schools should adopt the tools of the 4IR and ensure that their teachers have the necessary skills to guide their institutions into the future because the future is digital. School leaders must demonstrate the qualities of future-fit leaders by creating environments that result in outcomes that prepare all stakeholders for the future, with a focus on learning and creating favourable learning environments as well as sharing leadership. It is anticipated that this study has brought to light some of the traits and tactics used by rural school leaders to create institutions that are prepared for the future.

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