

# Emergency Remote Education in Southern African Schools: Digital Transformation Bridging the Gap in the COVID-19 Era

**Sifundo Nkomo**

<https://orcid.org/0000-0002-0624-8678>  
Graduate School of Business  
Leadership, University of South Africa  
nkomos@unisa.ac.za

**Walter Matli**

<https://orcid.org/0000-0003-3440-900X>  
Graduate School of Business  
Leadership, University of South Africa  
matliw@unisa.ac.za

## Abstract

The World Health Organization on 11 March 2020 declared the novel coronavirus (COVID-19) outbreak a global pandemic. Due to the spread of COVID-19 in 2020, several countries in Southern Africa implemented partial or complete lockdowns. This caused a halt to the physical learning process, with a need to move away from the usual face-to-face pedagogical methodologies and adopt emergency innovative instructional strategies that integrate digital technologies. This concept paper reviews the literature on the significance of digital transformation in empowering remote learning in times of crisis in Botswana, South Africa, Zambia, and Zimbabwe. These four countries were purposively selected because they play an integral part in the education sector in Southern Africa. Data were obtained from secondary sources. The findings are that, in Southern Africa, during the lockdowns, a variety of technological tools were used for emergency remote learning. These tools include the use of zero-rated applications such as television, radio, digital schools using Zoom and Google Classroom. The findings show that remote learning was the best emergency method to give learners access to education, although it had some challenges, including unfamiliarity with new technology, methods of dealing with the unknown, poor or no infrastructure, higher drop-out rates, and lowered academic achievement levels. From the findings, we conclude that the Southern African education sector massively adopted digital transformation in education, although some challenges were identified. A proposed integrated framework on digital transformation for schools in Southern Africa was crafted. The framework is likely to be feasible in the countries that are struggling to balance the learning process amid the new normal which is remote learning.

**Keywords:** digital transformation; education; Southern Africa; coronavirus; remote learning; Zimbabwe; South Africa; Zambia; Botswana

UNISA  university of south africa

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## Introduction

Worldwide, the education landscape has been undergoing unprecedented changes since the beginning of 2020 due to the disruptions caused by the outbreak of the coronavirus (COVID-19) pandemic. Countries throughout the world were forced to take drastic measures such as the declaration of a state of emergency to halt the spread of the disease. These measures included total lockdowns in either part of a country or an entire country to curtail movement and to force people to stay at home, as well as to maintain social distancing and isolation. Nearly 200 countries shut down schools, and more than 1.6 billion learners, representing nearly 80% of the world's student population in primary and secondary schools, were affected by the school closures (UNESCO 2020a). Several countries in Africa including Botswana, South Africa, Zambia, and Zimbabwe also joined the rest of the world and implemented partial or complete lockdowns. This caused a halt to the physical learning process, with a need to move away from the usual face-to-face pedagogical methodologies and adopt innovative instructional strategies that integrate digital technologies (Ahedor 2020; Sintema 2020; UNESCO 2020a). As much as some schools saw remote learning as the best method to give students access to education and to enable participation, Teymori and Fardin (2020) affirm that remote learning has its specific issues and challenges, including unfamiliarity with new technology and methods of dealing with unknown challenges, for many students and their teachers, higher drop-out rates, and lowered academic achievement levels, among others. The closure of schools inspired many education systems the world over to adopt remote teaching and learning. According to Ray (2020), remote learning provides an opportunity for learners and teachers to remain connected and engaged with the content while working from their homes. In the context of this study, all forms of learning that students experienced during the COVID-19 school closure are referred to as remote learning opportunities. The question is: What did the countries in Southern Africa do to bridge the gap in education in the COVID-19 era? This is investigated through a review of literature on various measures undertaken by primary and secondary schools in different countries to make the paradigm shift to digital pedagogy. It is against this background that this article proposes an integrated framework on digital transformation for schools in Southern Africa which empowers remote learning. This framework is likely to be feasible and of benefit to the countries that are struggling to balance the education sector amid the new normal which is remote learning.

## Education amid COVID-19 in Southern Africa

### South Africa

According to Mhlanga and Moloi (2020), on 23 March 2020, President Ramaphosa instituted a national lockdown that would last for 21 days from 26 March 2020 to 16 April 2020. The lockdown meant that among other organisations that would immediately close were schools and all institutions of higher learning. On 9 April 2020, the President of South Africa announced that the lockdown would be extended by a further 14 days (Mhlanga and Moloi 2020). According to Mhlanga and Moloi (2020),

the national lockdown would mean that the school calendar for the year 2020 would be disrupted. The Department of Basic Education partnered with some non-governmental organisations (NGOs) to make learning materials available as a way of reducing learning disruptions. The primary and secondary education sector in South Africa is governed by the Department of Basic Education (DBE). South Africa has nine provinces: the Free State, Limpopo, KwaZulu-Natal, the Eastern Cape, the Western Cape, the Northern Cape, Gauteng, Mpumalanga, and North West. These have provincial education departments that are responsible for implementing the policies of the national department, as well as dealing with local issues.

### **Botswana**

Motshabi (2020) revealed that when Botswana enacted a six-month state of emergency and full national lockdown prior to any COVID-19 cases in the country, parents, learners, and teachers found themselves unexpectedly isolated in their homes. According to Tabulawa (2009), the Ministry of Basic Education (MOBE) oversees the primary and secondary education system in Botswana. A study done by Winthrop et al. (2020) discovered that when schools closed in Botswana on 23 March 2020, due to the COVID-19 pandemic, education administrators, teachers, and ultimately parents were faced with difficult decisions about how to help children continue learning without setting foot inside a classroom. In-person classes resumed on 17 June 2020, though a second school closure occurred for two weeks from 30 July in greater Gaborone. Like almost all the other 200 countries that closed their schools, the education community in Botswana had to rapidly pivot to remote learning strategies (UNESCO 2020a). Policymakers, school leaders, educators, and education nonprofits quickly began to innovate with new ways of helping children learn (Angrist, Bergman, and Matsheng 2020).

### **Zimbabwe**

According to Tshili (2022), President Emmerson Mnangagwa declared a 21-day “total” lockdown from 30 March 2020, curtailing movement within the country, shutting most shops, suspending flights in and out of Zimbabwe and closing all schools as a means of fighting the spread of COVID-19. The whole of 2021 the schools opened physically for a few months only. In 2022, Zimbabwean President Emmerson Mnangagwa indefinitely deferred the reopening of schools, citing high numbers of COVID-19 cases fuelled by the Omicron variant. Schools were set to reopen on 10 January, but they delayed until 7 February, and only examination classes were allowed to reopen on 10 January (Mazingaizo 2022). According to UNICEF (2020), to reduce the extent of learning disruptions, the Ministry of Primary and Secondary Education (MOPSE) partnered with some organisations such as UNICEF to find new innovative ways of helping children learn. The primary and secondary education sector in Zimbabwe is governed by the MOPSE. The MOPSE is decentralised in 10 provinces: Bulawayo, Harare, Manicaland, Mashonaland Central, Mashonaland East, Mashonaland West, Masvingo, Matabeleland North, Matabeleland South, and Midlands. These have provincial education

departments that are responsible for implementing the policies of the national department, as well as dealing with local issues (Chiri 2020).

## **Zambia**

To contain the virus, the government of Zambia took preventive measures, including closing schools (*Daily Nation* 2021). Schools closed in 2020 due to high cases of COVID-19 and since then normal school terms have been disrupted. To mitigate the impact of this situation and ensure learners continued to learn, the Ministry of General Education worked with partners such as World Vision to implement a COVID-19 emergency response and recovery plan. According to Devex (2022), primary and secondary education in Zambia is managed by the Ministry of General Education (MOGE). MOGE facilitates education in 10 Zambian districts. The districts include Kabwe, Kapiri-Mposhi, Mpongwe, Mkushi, Kitwe, Kafue, Luanshya, Lusaka, Mazabuka and Monze.

## **Literature Review**

The literature advocates varied views concerning the effectiveness of such assessments, and this paper attempts to present these diverse perspectives. The study also endeavours to synthesise and present the challenges associated with the rampant use of digital teaching and learning platforms and the opportunities it created for primary and secondary schools to leverage even post-crisis.

The emergence and rapid spread of the novel coronavirus disease has disrupted education systems in Southern Africa and beyond. By mid-April 2020, it had interrupted the school, college, and university-based learning of nearly 1.58 billion students, comprising about 91.4% of the world's enrolled learners in 192 countries (UNESCO 2020a). In Africa, 262.5 million primary and secondary school children, about 21.5% of the continent's population, were out of school because of COVID-19-related school closures (Save the Children 2020).

The pandemic has affected learners' rights to quality, safe and inclusive education and social engagement with peers and educators (INEE 2020; UN 2020). Discussions around online learning and the use of television (TV) and radio for revision began to occupy the corridors of the education sector in Southern Africa as soon as the reality of lockdown struck. As such, several responses have been mounted by various organisations to mitigate against the loss of time because of the lockdowns. In Africa, COVID-19's most consequential impacts on education have been identified as the widening of inequalities, increases in marginalisation, and the inability of the most disadvantaged learners to pursue their studies and acquire knowledge and skills that support a healthy transition to adulthood (UN 2020; UNESCO 2020a). The most affected learners include those whose foundational learning was not strong: girls, children and youth with disabilities, and refugees, migrant and displaced children (Save the Children 2020). In Southern Africa, digital learning challenges are more acute in

rural communities with low levels of material resources, a lack of internet infrastructure, and widespread information and communications technology (ICT) illiteracy (SADC and UNESCO 2020).

## Methodology

The study mainly used the literature review approach, including document analysis and conceptual analysis of secondary sources of data, which included several peer-reviewed journals, reports, and even newspaper articles. The study benefited from published journals, policies, and reports from national and international organisations on COVID-19, remote learning, and digital transformation. The conceptual nature of the article presents a particular limit due to the limited nature of the data. Table 1 gives an estimated number of sources that helped to shape the direction of the study. Some of the journal reports and news articles listed in the table are not necessarily referenced in the paper, as they only contributed to ideas that led to the development of the paper. The number of journals, reports, and newspaper articles listed are estimates; they could be more.

**Table 1:** Journal articles, news articles, and reports that shaped study

<b>Journal Articles</b>	<b>Reports</b>	<b>News Articles</b>
32	13	25

## Results

To determine how various education sectors in Southern Africa responded to the pandemic to ensure that learning continues, the researchers extracted some of the tools and strategies used. These are presented in different categories as indicated in the discussions below. The tables try to demonstrate the technologies used. These technologies were used in various platforms created by various private institutions in partnership with the governments of Southern Africa to combat the effects of COVID-19 on education.

### **Digital Transformation in the Education Sector to Promote Remote Learning in Southern Africa during the Lockdown**

#### *Virtual Learning to Promote Remote Learning during the Lockdown*

Table 2 shows the tools used by different departments of education in Southern Africa to provide virtual classes during the lockdown. The different education departments made use of television and radio stations to offer virtual lessons exclusively to learners during the lockdown. As shown in the table, learners received lessons from television and radio stations.

**Table 2:** Virtual classes during the lockdown

<b>Tool used</b>	<b>Description</b>	<b>Connectivity</b>	<b>Platforms</b>	<b>Conditions of use</b>	<b>Target group</b>
Television	Teachers delivering lessons live to learners on TV	Offline	Television desktop	Free	Primary and secondary learners
Radio	Teachers delivering lessons live to learners on radio	Offline	Radio/desktop/mobile phones	Free	Primary and secondary learners

As presented in Table 2, different governments in Southern Africa and various sections of its media made some provisions for virtual learning. In a study done by Mhlanga and Mloi (2020), it was found that the DBE in South Africa used television and radio stations to offer virtual lessons exclusively to pupils during the lockdown, especially to those who did not have access to the internet, as they did not have computers, laptops, smartphones, and other gadgets to facilitate virtual learning. This was supported by the SABC Education initiative whereby students received lessons from SABC television and radio, DSTV, and e.tv stations. Motshekga (2020) stated that the national broadcaster added two studios where the broadcast of the virtual classrooms would take place. In these studios, teachers were delivering lessons live and in real-time to learners. This was done through virtual classrooms, teaching learners as they would in a physical classroom. Through e.tv, the government also allocated a dedicated channel for three months on the open-view platform for learners (Motshekga 2020).

According to UNESCO (2020a), the MOBE in Botswana confirmed the launch of educational television mid-April, broadcasting classes through television to assist distance learning. eThuto is a digital learning platform that was implemented in the north-eastern region of Botswana by the national government, and the Radio Lesson Programmes educational content was broadcast on RB1 (UNESCO 2020a).

In Zimbabwe, according to Mokwetsi (2020), to mitigate internet challenges the MOPSE, with support from UNICEF Zimbabwe, launched the Radio Lessons Programme. Education Cannot Wait (ECW) and Global Partnership for Education (GPE) have been supporting the development and broadcast of radio lessons. Some lessons were broadcast on National FM, Power FM, Classic 263, Radio Zimbabwe and Khulumani FM (Mokwetsi 2020). According to Netsianda (2020), the radio lessons have not been without challenges, with some caregivers suggesting that there should be a feedback mechanism for students to ask about areas of misunderstanding. The other challenge was electricity power cuts (Netsianda 2020). In a study done by Maphosa (2021), despite radio being the best-chosen option, learners in some rural settings were

still facing some challenges as there are no radio signals in their geographic locations. The teachers who were interviewed by Maphosa (2021) all agreed that with the present ICT infrastructure setup in Zimbabwe, radio is the best mode of delivering lessons. According to Maphosa (2021), in Zimbabwe, where there are no dedicated radio stations for educational programmes, learners may miss out on re-listening for more comprehension, and repeating the programmes may not be possible. These teaching modalities were not suitable for all students. For example, some learners with disabilities such as hearing and visual impairments have to depend entirely on family members to help them with home-based learning. Yet, some of these learners live with family members who do not have basic knowledge of sign language for communication with those with hearing impairments (Muchanga et al. 2020).

In Zambia, the MOGE in partnership with the Zambia National Broadcasting Corporation (ZNBC) established a television channel dedicated to broadcasting both primary and secondary school lessons in all subjects. These lessons were broadcast even after the re-opening of schools (Mukuka, Shumba, and Mulenga 2021). According to World Vision (2020), online learning platforms and lessons on television and local radio stations are currently supporting continuity of learning for children in non-examination classes that are still not able to access schools. Vulnerable learners received solar radios and SD cards with pre-recorded lessons to ensure access to distance learning content even in areas with poor or no radio frequency coverage. This is supported by a study done by Restless Development (2021), which found that learners in rural parts of Zambia like Choma where there are no radio signals were provided with small solar-powered radios with pre-recorded lessons. MOGE, Restless Development Zambia, and UNICEF Zambia worked together to design the radio programmes that would ensure continuity of learning, as the COVID-19 pandemic had forced the government to close schools throughout the country (Restless Development 2021). According to Nsofu (2020), the MOGE launched a television channel. The Zambian Educational Channel broadcasts classroom-based learning and life-skills programmes for children from primary to secondary level based on the Zambian national curriculum. The channel was launched through a collaboration between MultiChoice Zambia, as part of its Corporate Social Investment (CSI) initiatives; the MOGE and the ZNBC delivered televised education to Zambian learners as a result of the school calendar changes due to the COVID-19 pandemic (Nsofu 2020).

### *Digital School and Remote Learning*

In response to the COVID-19 disturbances, some digital schools were formulated. Table 3 indicates tools associated with the digital school.

**Table 3:** Tools associated with the digital school

<b>Tools used</b>	<b>Description</b>	<b>Connectivity</b>	<b>Platform</b>	<b>Conditions of use</b>	<b>Target group</b>
Internet (websites, learning applications)	Learners learn on their own at home	Online	Desktop/laptop/mobile	Free/reduced (lockdown)/some rights reserved	Primary and secondary learners
Social media applications (Facebook, WhatsApp, Twitter)	Teachers in public and private schools offer classes through a live stream	Online	Desktop/laptop/mobile	Free/reduced (lockdown)/some rights reserved	Primary and secondary learners
Microsoft Teams	Used mainly by learners in private schools	Online	Desktop/laptop/mobile	Free/reduced (lockdown)/some rights reserved	Primary and secondary learners
Zoom	Used mainly by learners in private schools	Online	Desktop/laptop/mobile	Free/reduced (lockdown)/some rights reserved	Primary and secondary learners
Google Meet	Used mainly by learners in private schools	Online	Desktop/laptop/mobile	Free/reduced (lockdown)/some rights reserved	Primary and secondary learners

In South Africa, according to the Independent Online (IOL 2020), the DBE published study material including textbooks, worksheets, revision booklets, and study guides on their website. In Cape Town, organisations joined forces to offer free online learning for school pupils during the lockdown. Organisations such as WorksheetCloud together with MySchool MyVillage MyPlanet provided funding for this programme. Lessons called WorksheetCloud Live Lessons were free and were offered to Grades 3–7. The lessons were for mathematics, English, and natural science. In these lessons, students enjoyed unlimited and free access to live-streamed online classrooms every day. Parents could easily, and freely, have access to learning material for their children. In another example from rural South Africa, cited in a study by Mukute et al. (2020), some learners had to rely on what had been learnt at school due to no internet connectivity to access teachers' emails or online resources. Some teachers in rural schools were also finding it difficult to ensure coherent lessons due to being disturbed and cyberbullied by pupils who posted jokes during online lessons. In their study, Mukute et al. (2020) found that some learners who had resources lacked the motivation to attend Zoom-based lessons as they felt that teachers did not care about them at all. The government of South Africa indicated that electronic readers were available via all platforms of major cell phone networks in South Africa, i.e. Vodacom, MTN, Telkom, and Cell-C, as well as 2Enable App, a freely downloadable educational platform, with more than 2000 educational



resources in the indigenous languages of the country available on electronic readers (Motshekga 2020; SABC 2020). In addition to that, South Africa's mobile networks gave room to learners across the educational divide to access teaching materials through zero-rated educational and informational (reference) websites (Chen 2020).

In their survey Matsheng and Angrist (2021) found that a majority of households in Botswana lack computers and internet access, so reaching families at home proved difficult. According to Matsheng and Angrist (2021), there is a "low-tech" approach that provided weekly SMS messages and live phone calls from instructors for virtual over-the-phone tutoring in basic numeracy concepts, such as place value or subtraction. Motshabi (2020), in her study, found that despite the recent focus on expanding the use of information and communications technology (ICT) in Botswana, the country was not ready for remote learning. The ICT infrastructure is limited and technology disparities among learners became evident based on home background and geographic location. Pedagogically, most teachers had no training or experience with remote teaching and learning. Wide-reaching radio and nationalised television still broadcast with analogue transmission and a nationalised curriculum helped to facilitate lesson delivery.

Zinyemba, Nhongo and Zinyemba (2021) conducted their study in Zimbabwe and found that for most learners in non-government schools, learning continued in the face of COVID-19 as they made use of internet-based platforms such as Google Classroom, Zoom, Microsoft Teams and Google Meet. The learners reported getting access to such platforms upon payment of fees, hence not all learners from non-government schools were covered, as learning was based upon payment for the service. Some of the learners in non-government schools, despite the availability of such learning platforms, did not attend all their lessons due to a myriad of challenges that were beyond their control such as power cuts with no backup power at home, poor internet connectivity, no connectivity at all and depletion of the paid-up bundle. The most affected learners were students who reside in rural areas as they were not attending any lessons as compared to their counterparts who were in urban areas. A study done by ECLAC and UNESCO (2020) noted that both rural learners and educators in Zimbabwe were mostly affected by the closure of schools due to lockdown restrictions as there was no proper infrastructure and basic resources that could enable online learning. The problem has been exacerbated by the increase in data and internet charges by some mobile network operators and internet service providers. This meant that only a few learners were afforded the online classes (Matabvu 2020).

In their study, Zinyemba, Nhongo and Zinyemba (2021) found that online learning in Zimbabwe faced a lot of educator resistance as not much was done to ensure that learning could be conducted in a conducive environment. The most cited challenge by the educators was footing the internet bill from their meagre salaries and making use of their gadgets to accommodate hundreds of assignments. Most of the learners and educators reported using WhatsApp and email. According to Thabela, Shumba and Muntanga (2020), the MOPSE, with support from education partners, used digital and

online learning platforms such as Ruzivo by Higher Life Foundation and other digital platforms to ensure continuous learning during the COVID-19 pandemic. UNESCO (2020c) also launched Dzidzo Paden Imfundwe'ndlini, a WhatsApp platform for remote teaching, and such digital platforms ensured continued learning for children in home isolation. This WhatsApp automated chatbot is aimed at distributing premium academic resources to learners who have limited or no access to the internet but have access to WhatsApp. The chatbot distributed curriculum-aligned academic resources (notes, past examination papers, and marking schemes) for Grade 7s, Form 4s, and Upper 6s (UNESCO 2020c). According to Nhongo and Tshotsho (2021), there are three methods of delivering instruction that conformed to remote teaching during the lockdown in Zimbabwe. These methods include online teaching, using the radio to deliver lessons, and the use of WhatsApp. In their study, Nhongo and Tshotsho (2021) found that although WhatsApp is not treated as a formal channel of education in Zimbabwe, teachers said that it is one of the most efficient modes.

In Zambia, to ensure learning continued during the forced school closures, the MOGE designed a programme for remote learning platforms. Learners with special education needs were provided with adapted tablets to access remote learning alongside their peers. UNESCO (2020b) found that most of the teachers and other educationists were ill-prepared to use technology to reach their learners during the pandemic. The teachers settled on the use of WhatsApp and Google Classroom, although the main challenges have been that some students were inaccessible. Many also did not have smartphones for online learning (UNESCO 2020b). The assessments done by UNESCO (2020b) revealed some of the obstacles to using ICT include limited equipment and poor internet connectivity. Additionally, the results flagged a rural-urban divide concerning these challenges, with rural areas suffering from a more unstable electricity supply leading to poor internet connectivity. In Zambia, rural learners had the lowest rate of ICT equipment, with 38% of them not having any computers at all.

## Proposed Digital Transformation Framework for Primary and Secondary Schools

Based on the challenges associated with the effective and successful implementation of the measures discussed in this paper, it seems almost impossible to reach out to all learners, especially those in rural areas and other underprivileged communities. The proposed framework provides suggestions on possible solutions that can ensure that learning continues amidst the COVID-19 school closures and other future calamities. The proposed framework, as shown in Figure 1, has four pillars, which include digital access, digital fluency, digital inventors, and digital handlers; all of these are interlinked.

### Digital Access

Digital access is the ability to fully participate in a digital society, in this case the digital educational society. As shown in Figure 1, digital access includes access to tools and technologies, such as the internet and computers, that allow for full participation in a

digital educational society. Teachers and learners need proper infrastructure (digital gadgets such as tablets, desktops, electricity), software (technology-based human interactivity, platforms delivery, media tools), and connectivity to access digital technologies.

### **Digital Fluency**

Both learners and teachers should be taught how to use digital technologies in education. Digital learning tools should be tailor-made for a particular age and geographical location. According to Tim Bell from the University of Canterbury (cited in TKI n.d.), digital fluency is about understanding how to use digital technologies, deciding when to use specific digital technologies to achieve a desired outcome, and being able to explain why the technologies selected will provide the desired outcome. Digital fluency means that both learners and teachers have the skills they need to communicate and access these digital technologies such as internet platforms, social media, and mobile devices to live, learn, and work. As shown in Figure 1, digital fluency includes information, data, and media literacy, information and communications technology (ICT) proficiencies, digital creation and innovation scholarship, digital identity and well-being, digital learning and development, communication, collaboration, participation, and digital safety. Both teachers and learners need to be aware of the knowledge, skills and attitudes required for them to use digital tools effectively. As shown in Figure 1, teachers and learners should be aware of the digital tools and applications (digital fluency) so that they can adapt to the changes in technology to obtain new information that can be encountered throughout life. When the teachers and learners are aware of the digital transformation, they will have the digital competence to use digital technology and communication tools appropriately to access, manage, combine, and evaluate information.

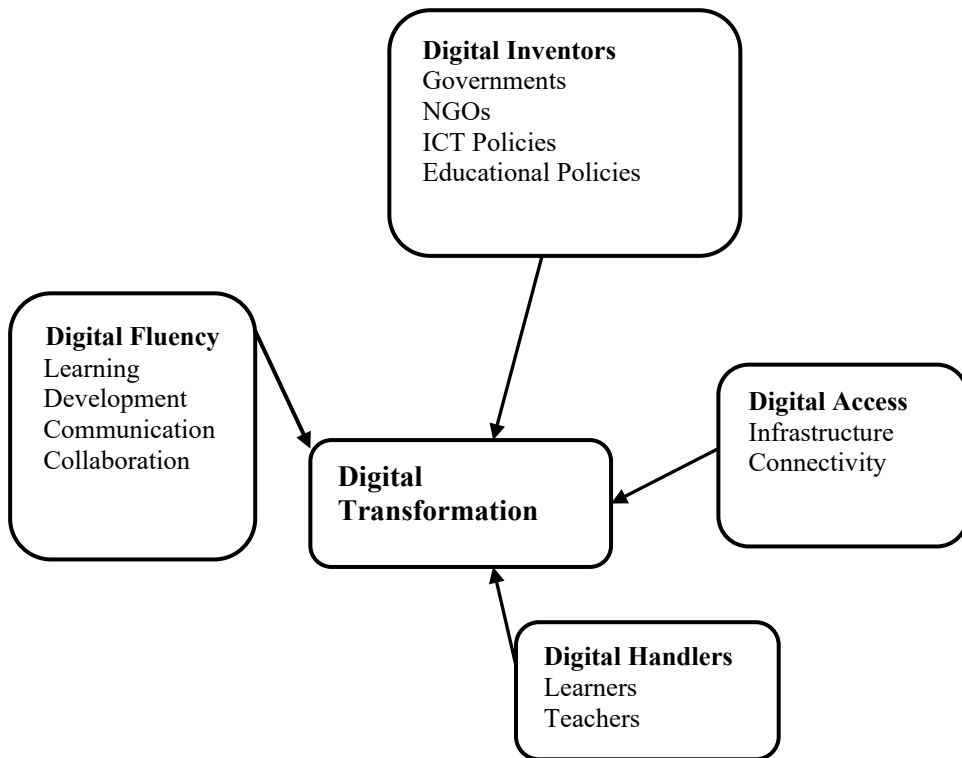
### **Digital Inventors**

Digital inventors are different stakeholders that have the capacity to drive the digital transformation of education by bringing technologies closer to the users. Different stakeholders involved in education should find ways to address the learning crisis by implementing strategies that seem challenging to implement. As illustrated in Figure 1, different governments must demonstrate their commitment to embracing 21st-century learning by crafting and fully implementing national policies that support modern teaching and learning. This includes, for example, understanding ICT in education policy; curriculum and assessment; pedagogy; application of digital skills; organisation and administration; and teacher professional learning. The governments should also work with non-profit organisations and international organisations such as the United Nations Children's Fund (UNICEF), and the United Nations Educational, Scientific and Cultural Organization (UNESCO) to have their goals aligned to digital transformation and the advancement of education regardless of their geographical location. The governments need to work closely with development partners to remove technological barriers and lower connectivity costs, as well as to invest in digital infrastructure and

digital literacy, especially for marginalised populations. To facilitate this, there is a need for Training Needs Analysis (TNA). TNA is defined by Ludwikowska (2018) as the process by which an organisation (schools) identifies the training and development needs of its employees (learners) so that they can do their job effectively (education performance). It involves a complete analysis of the training needs required at various levels of the organisation.

### Digital Handlers

Digital handlers in education, as shown in Figure 1, are teachers and learners. The innovative use of digital technology is beneficial for both teachers and students. By exploring new ways to include digital technology, educators come up with a better and more advanced form of teaching the learners. This helps in creating engagement and makes learning a fun activity and very flexible. Learners can attend the classes from anywhere and can study anytime they want. This helps in increasing educational productivity.



**Figure 1:** Framework for digital transformation to empower remote learning (FDTERL), synthesised by the researchers

### Conclusion

In this study, secondary research was done to understand how the digital transformation was adopted as an emergency measure to empower remote learning in Southern African

schools in the COVID-19 era. The study was based on a review of secondary data sources; these were mainly newspaper articles, magazines, peer-reviewed journals, and policy reports from national and international organisations. Based on our findings, we conclude that digital transformation can play a pivotal role in facilitating remote learning in Southern African countries. We also conclude that even though remote learning was the best method to give learners access to education and to enable participation, it had some challenges, including unfamiliarity with new technology and methods of dealing with unknown challenges, for many learners and their teachers, higher drop-out rates, and lowered academic achievement levels. A proposed integrated framework for digital transformation to empower remote learning in Southern Africa was crafted. The proposed framework demonstrates how having access to digital technologies and connectivity in Southern Africa can help not only in responding effectively to crises but also in planning for recovery and in building the resilience of education systems.

## Recommendations

Different governments in Southern Africa should demonstrate their commitment to embracing 21st-century learning by crafting and fully implementing national policies that support modern teaching and learning. An in-depth analysis of the strengths and weaknesses of the technology adopted should be conducted and this could be accompanied by a cost-benefit scenario analysis of each technology adopted.

## References

- Ahedor, J. 2020. "Can Teaching in Ghana Carry on Virtually as the Pandemic Rages?" *Scientific African Magazine*, April 11, 2020. Accessed January 10, 2022. <https://sciafmag.com/2020/04/11/can-teaching-in-ghana-carry-on-virtually-as-the-pandemic-rages/>.
- Angrist, N., P. Bergman, and M. Matsheng. 2021. "School's Out: Experimental Evidence on Limiting Learning Loss Using 'Low-Tech' in a Pandemic." IZA Discussion Paper No. 14009. Accessed January 13, 2022, <https://doi.org/10.2139/ssrn.3762879>.
- Chen, D. 2020. "Coronavirus: Overcoming the Educational Digital Divide in South Africa." *Tech Financials*, April 2, 2020. Accessed January 29, 2022. <https://techfinancials.co.za/2020/04/02/coronavirus-overcoming-the-educational-digitaldivide-in-south-africa/>.
- Chiri, M. 2020. "Value for Money Audit Report on the Registration, Supervision and Monitoring of Schools and Independent Colleges." Ministry of Primary and Secondary Education. Accessed January 5, 2022. <https://www.auditorgeneral.gov.zw/phocadownload/REGISTRATION%20SUPERVISIION%20AND%20MONITORING%20OF%20SCHOOLS%20AND%20INDEPENDENT%20COLLEGES%20REPORT.pdf>.

- Daily Nation*. 2021. "All Schools to Open on January, 2022 Govt." *Daily Nation*, January 3, 2020. Accessed January 10, 2022. <https://dailynationzambia.com/2022/01/all-schools-to-open-on-january-24-2022-govt/>.
- Devex. 2022. "Ministry of General Education (MOGE) (Zambia)." Accessed January 5, 2022. <https://www.devex.com/organizations/ministry-of-general-education-moge-zambia-52665>.
- ECLAC (Economic Commission for Latin America and the Caribbean) and UNESCO (United Nations Educational, Scientific and Cultural Organization). 2020. "Education in the Time of COVID-19: Report." Accessed January 5, 2022. [https://repositorio.cepal.org/bitstream/handle/11362/45905/1/S2000509\\_en.pdf](https://repositorio.cepal.org/bitstream/handle/11362/45905/1/S2000509_en.pdf).
- INEE (Inter-Agency Network for Education in Emergencies). 2020. "INEE Technical Note on Education during the COVID-19 Pandemic." Accessed January 5, 2022. <https://inee.org/resources/inee-technical-note-education-during-covid-19-pandemic>.
- IOL (Independent Online). 2020. "SA Learners Gain Access to Unlimited and Free Online Education during Lockdown." Independent Online, April 1, 2020. Accessed January 5, 2022. <https://www.iol.co.za/technology/software-and-internet/sa-learners-gain-access-tounlimited-and-free-online-education-during-lockdown-45891281>.
- Ludwikowska, K. 2018. "The Effectiveness of Training Needs Analysis and Its Relation to Employee Efficiency." *Zeszyty Naukowe Politechniki Poznańskiej. Organizacja i Zarządzanie* 77: 179–93. <http://doi.org/10.21008/j.0239-9415.2018.077.11>.
- Maphosa, V. 2021. "Teachers' Perspectives on Remote-Based Teaching and Learning in the COVID-19 Era: Rethinking Technology Availability and Suitability in Zimbabwe." *European Journal of Interactive Multimedia and Education* 2 (1): e02105. <https://doi.org/10.30935/ejimed/9684>.
- Matabvu, D. 2020. "E-Learning Exposes Education Gap." *The Sunday Mail*, May 10, 2020. Accessed January 5, 2022. <https://www.sundaymail.co.zw/e-learning-exposes-education-gap>.
- Matsheng, M., and N. Angrist. 2021. "Education in 2021: Perspectives from Botswana." Observer Research Foundation, January 8, 2021. Accessed January 10, 2022. <https://www.orfonline.org/expert-speak/education-in-2021-perspectives-from-botswana/>.
- Mazingaizo, S. 2022. "About 4.6-Million Pupils Affected by Zimbabwe's Decision to Keep Schools Closed." *Business Live*, January 4, 2022. Accessed January 10, 2022. <https://www.businesslive.co.za/bd/world/africa/2022-01-04-about-46-million-pupils-affected-by-zimbabwes-decision-to-keep-schools-closed/>.
- Mhlanga, D., and T. Moloi. 2020. "COVID-19 and the Digital Transformation of Education: What Are We Learning on 4IR in South Africa?" *Education Sciences* 10 (7): 180. <https://doi.org/10.3390/educsci10070180>.

- Mokwetsi, J. 2020. "Radio Lessons Provide Much Needed Continuity in Learning amid the Covid-19 Pandemic." UNICEF Zimbabwe, September 3, 2020. Accessed January 5, 2022. <https://www.unicef.org/zimbabwe/stories/radio-lessons-provide-needed-continuity-learning-amid-covid-19-pandemic>.
- Motshabi, K. 2020. "Lessons from Botswana on Continuing Learner Engagement during Covid-19." REACH, October 13, 2020. Accessed January 10, 2022. <https://www.reach.gse.harvard.edu/blogs/covid-19/series/lessons-from-botswana-on-continuing-learner-engagement-during-covid-19>.
- Motshekga, A. 2020. "Basic Education Sector Plans to Support Learners during Coronavirus COVID-19 Lockdown." South African Government, March 26, 2020. Accessed January 10, 2022. <https://www.gov.za/speeches/minister-angie-motshekga-basic-education>.
- Muchanga, M., B. De Souza, E. Negumbo, T. Tembo, R. T. Chipere, S. Nhnyete, N. L. Garapo, M. Coetzee, and M. Madiba. 2020. "Exploring Educational Lives of the Excluded Youth under COVID-19 in the SADC Region." Accessed January 11, 2022. <https://www.jet.org.za/resources/sadc-theme-3-exploring-educational-lives-of-excluded-youth-final-aug.pdf/view>.
- Mukuka, A., O. Shumba, and H. M. Mulenga. 2021. "Students' Experiences with Remote Learning during the COVID-19 School Closure: Implications for Mathematics Education." *Heliyon Journal* 7 (7): e07523. <https://doi.org/10.1016/j.heliyon.2021.e07523>.
- Mukute, M., B. Francis, J. Burt, and B. De Souza. 2020. "Education in Times of COVID-19: Looking for Silver Linings in Southern Africa's Educational Responses." *Southern African Journal of Environmental Education* 36: 1–16. <https://doi.org/10.4314/sajee.v36i1.7>.
- Netsianda, M. 2020. "COVID-19: Government Launches Radio Lessons for Pupils." *Chronicle*, August 24, 2020. Accessed January 5, 2021. <https://www.chronicle.co.zw/covid-19-govt-launches-radio-lessons-for-pupils/>.
- Nhongo, R. and B. P. Tshotsho. 2021. "The Shortcomings of Emergency Remote Teaching in Rural Settings of Zimbabwe during COVID-19 School Closures: Lessons from China's Experience." *Africa's Public Service Delivery and Performance Review* 9 (1): a482. <https://doi.org/10.4102/apsdpr.v9i1.482>.
- Nsofu, M. 2020. "ZNBC Partners with Multichoice Africa." ZNBC, September 29, 2020. Accessed January 5, 2022. <https://www.znbc.co.zm/news/znbc-partners-with-multichoice-africa/>.
- Ray, K. 2020. "What Is Remote Learning?" Tech Learning, March 31, 2020. Accessed January 29, 2022. <https://www.techlearning.com/how-to/what-is-remote-learning>.
- Restless Development. 2021. "Learning through Radio amid COVID-19." Accessed January 10, 2022. <https://restlessdevelopment.org/2021/07/learning-through-radio-amid-covid-19/>.

- SABC. 2020. "SABC Education—Virtual Teaching Becomes a Reality through New Education Technology." Accessed January 29, 2022. <http://sabceducation.co.za/news-module/3583-virtual-teaching-becomes-a-reality-through-new-education-technology>.
- SADC (Southern African Development Community) and UNESCO (United Nations Educational, Scientific and Cultural Organization). 2020. "SADC and UNESCO Sign Agreement to Ensure Learning Never Stops." Press Release. Accessed August 24, 2022. <https://www.unesco.org/en/articles/sadc-and-unesco-sign-agreement-ensure-learning-never-stops>.
- Save the Children. 2020. "Save the Children: Outbreak Could Cause Millions of Children to Suffer for Years to Come." Accessed January 16, 2022. <https://www.savethechildren.org/us/about-us/media-and-news/2020-press-releases/outbreak-could-cause-years-of-suffering-for-millions-of-children>.
- Sintema, E. J. 2020. "Effect of COVID-19 on the Performance of Grade 12 Students: Implications for STEM Education." *Eurasia Journal of Mathematics, Science and Technology Education* 16 (7): em1851. <https://doi.org/10.29333/ejmste/7893>.
- Tabulawa, R. T. 2009. "Education Reform in Botswana: Reflections on Policy Contradictions and Paradoxes." *Comparative Education* 45 (1): 87–107. <https://doi.org/10.1080/03050060802661410>.
- Teymori, A. N., and M. A. Fardin. 2020. "COVID-19 and Educational Challenges: A Review of the Benefits of Online Education." *Annals of Military and Health Sciences Research* 8 (3): e105778. <https://dx.doi.org/10.5812/amh.105778>.
- Thabela, T., S. Shumba, and D. Muntanga. 2020. "Education Cluster Strategy: Zimbabwe COVID-19 Preparedness and Response Strategy." Accessed January 5, 2022. [https://reliefweb.int/sites/reliefweb.int/files/resources/zimbabwe\\_education\\_cluster\\_covid\\_strategy\\_12.05.2020\\_final.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/zimbabwe_education_cluster_covid_strategy_12.05.2020_final.pdf).
- TKI (Te Kete Upurangi). n.d. "Digital Fluency." Accessed January 5, 2022. <https://elearning.tki.org.nz/Teaching/Digital-fluency>.
- Tshili, N. 2022. "President Defers Schools Opening." *Chronicle*, January 2, 2022. Accessed January 10, 2022. <https://www.chronicle.co.zw/president-defers-schools-opening/>.
- UNESCO (United Nations Educational, Scientific and Cultural Organization). 2020a. "National Learning Platforms and Tools." Accessed January 5, 2022. <https://en.unesco.org/covid19/educationresponse/nationalresponses>.
- UNESCO. 2020b. "How Ready Are Teachers in Uganda and Zambia to Adopt Remote Teaching?" UNESCO, October 9, 2020. Accessed January 29, 2022. <https://en.unesco.org/news/how-ready-are-teachers-uganda-and-zambia-adopt-remote-teaching>.



- UNESCO. 2020c. "To Launch DzidzoPaden | Imfundwe'ndlini App to Support Remote Learning and Access to Academic." UNESCO, November 20, 2020. Accessed January 5, 2022. <https://en.unesco.org/news/unesco-launch-dzidzo-padenimfundwendlini-app-support-remote-learning-and-access-academic>.
- UN (United Nations). 2020. "Policy Brief: Education during Covid-19 and Beyond." Accessed January 29, 2022. [https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/08/sg\\_policy\\_brief\\_covid-19\\_and\\_education\\_august\\_2020.pdf](https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/08/sg_policy_brief_covid-19_and_education_august_2020.pdf).
- Winthrop, R., M. Ershadi, N. Angrist, E. Bortsie, and M. Matsheng. 2020. "A Historic Shock to Parental Engagement in Education: Parent Perspectives in Botswana during COVID-19." Brookings Institution. Accessed January 5, 2022. <https://files.eric.ed.gov/fulltext/ED610673.pdf>.
- World Vision. 2020. "Policy Brief: COVID-19 and Its Impacts on Children's Education in Zambia." Accessed January 5, 2022. <https://reliefweb.int/report/zambia/policy-brief-covid-19-its-impacts-childrens-education-zambia-july-2020>.
- Zinyemba, L., K. Nhongo, and A. Zinyemba. 2021. "COVID-19 Induced Online Learning: The Zimbabwean Experience." *African Journal of Social Work* 11 (4): 223–30.