South African Secondary School Discussions on Digital Learning and Pandemic Preparedness

Mncedisi Christian Maphalala[1], Dumisani Wilfred Mncube[2] & Rachel Gugu Mkhasibe[2]

[1] Durban University of Technology (DUT), South Africa

[2] University of Zululand, South Africa

Correspondence: Prof Dumsani W Mncube, PhD, Associate Professor-Curriculum Studies, Faculty of Education, School of Professional Studies in Education, North-West University, South Africa

Abstract

The outbreak of the COVID-19 pandemic in 2020 revolutionised the education sector across the world and forced schools to embrace online learning. Schools had to scramble for alternatives to face-to-face learning to curb the spread of COVID-19 while ensuring that learning was not disrupted. With the second wave of the COVID-19 pandemic cropping up at the beginning of the 2021 academic year and a growing number of teachers contracting the virus, schools were forced to close temporarily or adjust learning models to continue with remote teaching and learning. This required schools to deal with the challenges of infrastructure and a shortage of teachers, as well as provide learners with access to technology and reliable internet connections that would allow them to study remotely and prepare teachers for online pedagogies. To this end, this study explored secondary teachers' experiences with the transition to remote learning during the COVID-19 pandemic lockdown and their readiness to embrace online learning as the second wave of the COVID-19 pandemic wreaked havoc on the entire globe. The study was underpinned by the technology acceptance model and adopted a qualitative research design, generating data from 10 teachers using focus group discussions. An inductive thematic framework was used during the data analysis segment. The study found that schools encountered a variety of digital complexities to overcome, such as digital literacy and online teaching capabilities, multimodal learning, postlockdown teaching and educational leadership and appropriate learning management systems.

Keywords: digital divide, digital literacy online learning, technology acceptance model

1. Introduction

The 2020 academic programme in both basic and higher education was severely affected by the COVID-19 pandemic. The abrupt move from the classroom to remote, online learning at the outbreak of the pandemic interrupted learning for learners in low-income areas around the world. According to the United Nations (2020, p. 2), the COVID-19 pandemic disrupted a significant proportion of education systems, affecting nearly 1.6 billion learners in more than 190 countries across all continents. Schools have investigated and continued to explore online learning modalities that might mitigate future disruptions. In South Africa, learners in rural areas did not receive education after schools closed, and they were forced to continue teaching through remote learning or distance learning. This study poses the question of whether South African schools are ready for digital learning in light of the COVID-19 pandemic.
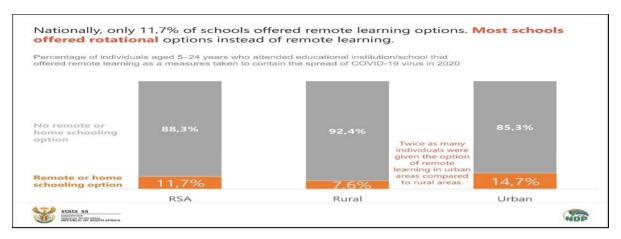
Figure 1. Schools offering remote learning in South Africa (Statistic South Africa, 2020)

The report released by Statistic South Africa in 2020 painted a frightening but expected picture of only 11.7% of schools managing to offer remote learning nationally. Most schools offered rotational options instead of remote learning, and the urban–rural divide was prominent; twice as many individuals were given the option of remote learning in urban areas compared to rural areas.

2. Literature Review

Access to digital technology has become a defining characteristic of the 21st century. Integrating online technology into curricula to influence teaching and learning has been in a state of evolution for more than 20 years (Ago, 2015). Mhlanga and Moloi (2020) cited the COVID-19 pandemic as the main event that fast-tracked digital transformation in the education sector during lockdown. Aheto (2018) stressed that technological advances are defining a new approach to education whereby digital platforms promote virtual teaching and learning that is undertaken remotely and on digital platforms. He stated this is because it seems unlikely that things will ever go back to what they were before the pandemic, at least for quite some unknown time to come (Mail & Guardian, 2016). Furthermore, Matseka et al. (2018) argued that the main advantage of digital learning is that it makes learning more active and dynamic compared to face-to-face learning in in-class environments because it is learner-centred instead of teacher-centred.

In other words, learners are given space to work at their own pace and facilitate learning through a variety of activities using their preferred learning style. Moreover, they have access to quick and appropriate resources at a lower cost (Mpungose, 2020; Dube, 2020). That is why Butucha (2020) argued that digital learning is a money saver and a game changer because it limits commuting to crowded spaces, offers flexibility in choices and saves time. Learners, even in developing countries, are well acquainted with digital technology, but this reality is not reflected, for the most part, in the environment of rural schools. This is because many schools in rural areas have limited or no access to the use of digital technology (Madida et al., 2020).

Thus, the findings of Buabeng-Andoh (2015) echoed Madida et al.'s (2020) assertion when they revealed that teachers who are in rural schools perceive digital technology usage, access, training and competence as low. Buabeng-Andoh's (2015) findings further indicated that, in rural schools, learners' pedagogical use of digital technology is also low. This demonstrates that rural schools are facing more challenges compared to their urban, suburban and town counterparts (Building Technology Infrastructure for Learning, 2017).

For digital learning to occur, there should be digital devices, i.e., information communication and technology (ICT) to support learning (Ferri et al., 2020). Additionally, for these digital devices to function successfully, there must be stable internet access (Madida et al., 2019). Furthermore, schools prefer teachers who are adequately skilled and trained to use relevant digital technologies to ensure that learners are not overloaded with study materials and assignments (Aristovnik et al., 2020). Moreover, this pedagogy requires a lot of self-discipline and motivation from teachers to follow through with online lessons, because the learners are studying from home. Furthermore, the school and all relevant stakeholders, such as district authorities, parents and the community, need to create a shared vision for how digital technology can best meet the needs of all learners and develop a plan that translates that vision into action.

Such a vision would enable staff members to use digital technology more productively (Czerniewicz & Brown, 2009). Agbo (2015) stressed that the availability of a vision and plan for how digital technology is used as a teaching and learning tool makes digital learning more effective. If a school does not have a vision or it is not well adopted, teachers may view the use of ICTs for curriculum delivery as an add-on and not as an integral part of teaching and learning (China et al., 2015). According to Du Plessis and Webb (20210), although the country has undergone a transition from apartheid to democracy, inequality lays bare issues of race, class, gender and socioeconomic status. Du Plessis and Webb (2010) also argued that despite progressive curricula introduced since the first democratic elections in 1994, rural schools do not have the same resources that more privileged schools situated in middle- and upper-class neighbourhoods have. This is highly evident in the Black population.

The majority of schools lack electricity; have frequent power outages; have poor technology infrastructure, overcrowded computer labs (if they have them at all) and internet connectivity; lack software licenses and equipment maintenance; and have insufficient and inappropriate software (Onguko & Hennessy, 2010). Technologies were introduced through various platforms created by various private sectors in partnership with the government of South Africa to combat the effects of the COVID-19 pandemic on education. This partnership resulted in the cost of mobile networks dropping. However, notwithstanding these measures, a majority of rural schools did not benefit due to their impoverished conditions, which limits access to the internet. This shows that there is a lot of hard work to be done by the Department of Education to improve access to basic education in rural schools.

Poor adoption of digital learning can be caused by several factors in developing countries. For instance, an Organization for Economic Co-operation and Development (OECD) report identified a lack of coordinated strategy as the major drawback to easing the integration of ICT in South Africa (OECD, 2016). Lazarov (2018) identified insufficient integration of ICT into mainstream education as a product of insufficient practical pedagogical training of teachers on digital technology integration during the teaching process. Moreover, the training of teachers in the utilisation of ICT for teaching requires long-term continuous development of the lead trainers, sharing of knowledge among teachers, and partnerships and collaborations among teachers and schools (including support from principals and administrators; Agbo, 2015). Regardless, inadequate digital technology infrastructure, such as computers, poor internet connections, lack of digitally competent teachers and teachers' attitudes toward acceptance and usage of digital technology are also some of the barriers affecting the adoption of digital technology in rural schools (Chisago et al., 2020; Maphalala, Mkhasibe & Mncube, 2021). This agrees with Mohammad et al.'s (2012) finding that there is a lack of effective training for teachers to become competent in using digital technology. The sceptical attitude of both teachers and learners towards the use of digital technology is something that Wang et al. (2013) referred to as the attitude of "digital immigrants" (p. 1).

Chigona et al. (2010) argued that teachers' attitudes are caused by a fear of losing dominance in the classroom, adding that these barriers to the use of digital technology are associated with sociological factors such as age and teachers' personal experiences. Sikhakhane et al. (2020) labelled this dilemma as the conspicuous disparity between expectations and reality rooted in the culture of poor governance. Teachers' willingness and knowledge to adopt digital technology needs to be discussed by all relevant stakeholders because, even if a rural school can acquire some of the required facilities to use digital technology if the stakeholders are not willing or are unable to use the technology, digital learning cannot be effective. Hence, vision and planning in collaboration with teachers have to occur, because implementing digital technology without the potential users' acceptance and willingness (Farat, 2012).

Besides, Buabeng-Andoh (2015) stated that the usage of digital technology is very low in Ghana due to a high number of digital migrants who prefer to use textbooks as their teaching and learning tool in public schools. Moreover, they do not have access to digital technology. Madida et al. (2020) documented factors including a shortage or complete lack of technology facilities due to high costs of ICT resources, skills deficiency and inaccessibility of ICT resources, which are challenging issues rural schools face in Malaysia. However, the Malaysian government has established National Broadband Initiatives (NBI) aimed at addressing the issue of inaccessibility of ICT resources in rural communities. Madida et al. (2020) further explained that Uganda is experiencing the same challenges as those experienced by other developing countries. For instance, they are experiencing high data costs and unreliable electricity due to economic uncertainties.

Scholars describe factors affecting digital technology usage in different ways. For instance, Makki et al. (2018) made a comparison between barriers related to resources and institutions (i.e., *external* barriers) versus those related to teachers and their attitudes (i.e., *internal* barriers). Furthermore, Madida et al. (2020) stated that internal barriers strongly affect ICT uptake among teachers for their professional use. They further highlighted that these barriers are

rooted in teachers' cultural dynamics (e.g., teachers not willing to adapt to modern methods of teaching and being stuck in traditional modes of teaching). External barriers are associated with issues such as insufficient time to incorporate ICTs in daily lessons and a lack of access to technical support within the schools (Makki et al., 2018).

There is no single solution that exists to address the many different challenges of ICT integration because different perspectives of integrating ICT can be chosen. This means that the success of ICT implementation is not dependent on the availability or absence of one individual factor but is determined through a dynamic process involving a set of interrelated factors (Agbo, 2015).

3. Theoretical Framework

The theoretical framework that underpinned this study is the technology acceptance model (TAM). Sumak et al. (2011) confirmed that the TAM is the most common theory in digital learning acceptance literature because its purpose is to explain and predict technology adoption behaviour. Similarly, Chisango et al. (2020) argued that the key purpose of the TAM is to provide a basis for tracing the impact of external factors (for this study the external factors refer to the schools and institutions) on internal beliefs, attitudes and intentions. According to Miller and Khera (2010), this model is based on two constructs, namely, perceived ease of use (PEOU) and perceived usefulness (PU). To be precise, PEOU influences PU. Davis (Mensah, 2016, p. 40) defines PU as "the degree to which an individual believes that using a particular system would enhance his or her productivity." This analysis shows the extent to which PEOU can generate desire while PU improves the actual usage of technology. That is the reason why Chisango et al. (2020) argued that this model also identifies barriers and enablers to digital technology adoption. For instance, a lack of appropriate digital technology devices and a lack of connectivity are perceived as major barriers in most schools, especially those situated in rural and township areas. Such a situation causes supposed users of digital technology to have a sceptical attitude towards its usage. However, if the situation is favourable, the potential users' attitude is enhanced after being exposed to the usage of digital technology.

Several studies have revealed that irrespective of massive government investment in ICT for teaching and learning, ICT integration is still irregular and insignificant (Lazarov, 2018; OECD, 2016; Padayachee, 2017; Wetering et al., 2019). An OECD report identified a lack of coordinated strategy as a major drawback to easing the integration of ICT in South Africa (OECD, 2016). Lazarov (2018) identified insufficient integration of ICT into mainstream education as a product of insufficient practical pedagogical training for teachers regarding digital technology integration during the teaching process. Sikhakhane et al. (2020) labelled this dilemma as the conspicuous disparity between expectations and reality rooted in the culture of poor governance. It is not surprising that a lack of educational vision and goals is among the reasons leading to futile ICT integration, i.e., lack of clarity on establishing levels of compatibility of ICT with teaching and learning goals (Lazarov, 2018).

Moreover, because of the COVID-19 pandemic, education policymakers and other service providers have struggled to address the perceived ease and use of technology. The country lags behind at a time when ICT is seen as a panacea due to big gaps in terms of computer literacy between teachers and students The surge in demand for relevant, high-quality digital learning resources, websites and software cannot be overestimated. Schools are desperate for a magic bullet that would fix the education technology system beyond the COVID-19 pandemic.

4. Research Methodology

A qualitative method approach was used to answer the research question. Focus group discussions were used to collect data. This study was conducted in September of 2021 before teachers went on recess, soon after strict COVID-19 pandemic protocols were revised down to adjusted alert level 2. The discussion focused mainly on the teachers' experiences and preparedness to transition to online learning during the COVID-19 lockdown in South African secondary schools. De Vos et al. (2011) argued that focus group discussion is a suitable tool to generate data sources from a group of participants who share specific characteristics. The topic about teachers' preparedness to transition to online teaching targeted schools in the uMlalazi circuit within the King Cetswayo district. Another important benefit was that focus group discussion provides rich data within a short space of time and has a high level of face validity. This method created a nonthreatening atmosphere for the participants to allow the researcher to generate rich data suitable to shape planning and strategic intervention by the Department of Basic Education to introduce online learning across the education sector in South Africa.

4.1 Sample and Sampling Procedure

Purposive sampling was used to identify and select 10 teachers, from rural secondary schools in the uMlalazi circuit within the King Cetshwayo district, who had in-depth information about and practical experience in generating ideas to move from contact to online learning. Participants were informed that the discussion was going to be recorded

using the Zoom app. The researcher requested every participant to familiarise themselves with consent forms that detailed ethical considerations such as confidentiality, anonymity and beneficence. The app was activated after consent was granted by the participants. The Zoom app was used to record focus group discussion data, which lasted for a period of 2.5 hours.

4.2 Research Instruments

Data were generated using a focus group discussion. According to Krueger & Casey (2009, p. 2), a focus group interview is "a carefully planned discussion designed to obtain perceptions on a defined area of interest in a permissive, nonthreatening environment." This paper sought to find out from the participants whether South African schools are ready for digital learning in light of the COVID-19 pandemic. The discussion adopted a conversational style, as suggested by Kvale and Brinkmann (2009), and was based on the following key questions:

- What were the teachers' experiences with the transition from face-to-face learning to online learning during the coronavirus lockdown?

- What were the teachers' views about learners and their ability to access technology and the internet from home?

- What teaching and learning modalities have teachers been exposed to that have enabled them to teach in the online learning environment?

- What is the teachers' level of proficiency with the technology as it relates to delivering efficient online learning?

- What are the teachers' views about the role of the school management team in enabling or constraining effective online learning?

4.3 Data Analysis Approaches and Techniques

The focus group discussion was recorded, transcribed and later analysed using the thematic analysis method. Braun and Clarke (2006) laid out efficient rules to follow in generating themes that make a significant impact in any study. Thematic analysis helps identify the most useful information that may inform a narrative of a given theme. Normally, these themes might be distinctive from but contradictory to other themes; however, they should be tied together to produce a coherent and lucid picture of the data set. The researcher developed a clear connection between the themes to ensure they are logical and can enhance meaning to build a cogent narrative of the data analysis process.

5. Findings

Four themes emerged from the analysis of the data obtained from the answers to the research questions. The findings of the study were analysed under these themes, which are as follows: digital divide, digital literacy and online teaching capabilities, multimodal learning, and post lockdown teaching and educational leadership and appropriate learning management system (ALMS). The analysis revealed that the digital divide between rural and township schools is pervasive and normalised in South Africa. Learners in rural schools struggle to access online learning material compared to township schools due to a lack of internet connectivity and appropriate learning devices. Xoli (pseudonym) explains, "*during [the] COVID-19 pandemic, schools who lacked connectivity were exposed and became more vulnerable to the COVID-19 pandemic than their urban counterpart. If you understand the rural context, the majority of parents are unemployed, and poor and only fight to meet their basic needs such as food and shelter. So, during the lockdown, teaching and learning came to a standstill in our school as such the School Management Team (SMT) decided that we could not begin with online learning because parents could not afford to buy learners technological devices and data to enable them to access educational resources promised by the Department of Education.*" The digital divide that exists between urban and rural schools was also confirmed by a teacher whose child attends a private school. Sissy (pseudonym) had direct experience of this divide, stating, "*the schools in urban areas were able to embrace online teaching immediately after lockdown because parents were able to avail necessary resources for learning from home for their children. My child goes to a private school at Empangeni, and they have been receiving several activities to be engaged in whilst they were at home. They can hold Zoom sessions with the teachers. On the contrary, in a school where I teach just outside Kwa-Dlangezwa township, we tried to engage learners in online learning without success, only a few learners attempted to engage with the posted materials.*"

The government announced that it was collaborating with mobile networks and ICT companies to provide access to online zero-rated educational resources and websites. However, a majority of learners in rural areas and townships struggled to access online learning due to a lack of appropriate devices or not having internet connectivity. Xoli

(pseudonym) said about this, "*I would say during the lockdown in my school no teaching and learning took place, first and foremost not all parents have reliable contact numbers. We did not have a system in place to communicate with the parents once the learners were not able to come to school. Even though the government announced zero-rated educational resources and websites for learning purposes, our learners in rural areas did not have access to the necessary technology to access those online resources.*" Timid felt that zero-rated websites provided by the government in collaboration with network companies were not a magic bullet to solve online learning challenges in the sector, especially if learners do not have access to appropriate technology. He had the following to say: "*Zero-rating websites – good, but not enough because you still need to own a gadget. The parents at our school can't even afford to make all the necessary stationery available for their children. How could we then expect them to have laptops, tablets, and data to allow them to participate in online learning?*"

Teachers themselves do not have technological devices and access to the internet to enable them to facilitate remote learning. Zenzo (pseudonym) had this to say, "*Remote learning does not take place in a vacuum; both learners and teachers need access to affordable data to allow them to access the online resources required to continue with online learning. I am one of those teachers who does not own a laptop and I cannot afford data if the Department of Education does not provide it for us. So, teachers and learners alike do not have the required tools for online learning.*" Both teachers and learners need to be actively engaged to stay technologically proficient. Before the pandemic, teachers had not been trained formally on the use of technology for online learning. Refilwe (pseudonym) concurs with this point, adding, "*The challenge is not only about access to the technology and data but how to use those to benefit the learners. We should not assume that teachers are technologically savvy, we also need thorough training on how to operate various technological devices and how we can package curriculum online. Before both teachers and learners become proficient in using technology, we cannot effectively engage in e-learning. For starters, I would need computer literacy, because I cannot use a computer.*"

The digital transformation in the education sector also requires that learners are taught how to navigate digital learning platforms because a number of them do not have access to the internet and computers at home. Duncan made the following comment, "*Referring learners to online educational resources when they have never been exposed to technology and such platforms before is counterproductive. Few learners have been exposed to computers in my school, some do own smartphones but have not used them as a learning tool at school.*" Amid the pandemic, teachers made attempts to adjust their teaching under these constrained conditions. Frogi (pseudonym) explained, "*It was a challenge to teach through WhatsApp because some learners don't even have phones, but other learners could access the materials through their parents' phones when their parents were home. Some learners relied on their friends for sharing the activities which were supposed to be done. I also referred my learners to the radio and TV programmes which were relevant to my subject, which is Mathematics.*"

Bonny (pseudonym) agreed that teachers resorted to various means to continue engagement with their students before and after the lockdown, saying, "*I have seen many teachers trying to put the interests of the learners first, during the lockdown and after the lockdown, by reaching out to the learners through WhatsApp messaging, text messages and emails. I got used to sending homework and other activities through WhatsApp because most of my learners could access it easily as compared to emails and text messages.*" In other schools, it became business as usual after the lockdown, with few teachers integrating limited use of technology in their teaching. Fish confirms that when schools reopened after the lockdown the focus was on catching up and saving the academic year. "*We were pressured to cover the curriculum and prepare grade 12 for the examination; we did not have time to try and implement online learning. With the limited time we had to catch up we had morning face-to-face classes and Saturday classes to ensure that learners were ready for the examination. We could not find time to explore new ways to teach using online learning platforms other than sending SMSs to the parents to relay important information to the learners. It's something to consider though in* [the] *future.*"

Teachers are of the view that at the school level the principals and the SMT must chart a way forward in embracing e-learning. Frogi (pseudonym) commented, "*The COVID-19 pandemic has demonstrated to us that we can no longer avoid technology in education. The teaching as we knew it is no longer the same, it now demands we find innovative ways to engage learners even when they are away from school. This is not only a requirement because of the corona, for instance when learners are hospitalised or homebound and cannot attend school for whatever reason, but they also should not be disadvantaged. They should be able to learn from wherever they are.*" This, therefore, calls for the SMT to lead the online learning plan of the school. Schools were caught off guard by the COVID-19 pandemic and were not prepared to implement online learning. Even after schools reopened, Online teaching has not been prioritized. Xoli (pseudonym) confirmed this by saying, "*I was hoping that after this wake-up call by the virus, we were seriously going to consider how to go about taking baby steps in bringing technology into teaching and*

learning. I am talking here about the basics and not advanced technology. Since schools reopened, we have not spoken about how we move forward in terms of online learning should we be forced by circumstances to close again. I guess this is a conversation that needs to be initiated by the principal and his team."

There should be a change management programme that should prepare heads of schools to lead this change. One participant was of the view that school principals must champion online learning in schools and enable teachers to perform this role. Duncan (pseudonym) had the following to say, "*Principals have not shown leadership when it comes to e-learning. E-learning is new to all of us, I am not even sure if they know where to begin to marshal everyone towards technology-enhanced teaching and learning. They need to be capacitated on how they should lead schools during the Fourth Industrial Revolution. We should not only limit e-learning to coronavirus, but we must have a bigger picture for future development and the power of technology in transforming lives. The school leadership could have considered recent disruptions in education and charted a new path to promote the integration of technology into teaching and learning starting with a cell phone as a basic tool for e-learning. The findings reveal that schools do not have a universal digital platform that allows all learners to learn at anytime and anywhere in a single digital portal.*" Timid has this to say, "*We do not have a platform where all the required resources can be found for teaching. Teachers are not that creative to navigate around complex online technologies and software. For instance, I cannot conduct assessments online because we don't have tools from the Department of Education that can enable us to do that.*"

The education sector needs a common learning management system. Participant 4 confirms that the Department of Education has not adopted a common learning platform for learning across schools. Refilwe (pseudonym) agrees that a universal learning platform is required, saying, "*My take is that as a sector we still have a long way to go to get to a level where we can use online learning efficiently. For starters, we need a common system, or an app designed specifically to serve to deliver learning in schools. During the lockdown, we were referred to a few websites for educational resources. It is a very tedious process to go in and out of different sites and, sometimes, you could tell that this was a stopgap measure and not properly coordinated.*" The Department of Education needs to ensure that there are support systems in place and that appropriate educational software is provided for an equitable online learning experience for all learners. Xoli (pseudonym) had the following to say, "*The government needs to invest in technology and support systems if the dream to implement e-learning across public schools is to be realised. For now, in our school, we have data projectors and computers which we use for teaching in a face-to-face environment. Once I leave the school, I can't use these to continue teaching outside the classroom. The equipment is only for use when we teach but learners cannot use these for remote learning.*"

6. Discussion

The COVID-19 pandemic vividly exposed the glaring inequalities in the education system, which were manifested in the digital divide when schools were expected to immediately move to online learning during the lockdown. Since the closure of schools to observe the national state of disaster, optimal learning and teaching were compromised. This study lays bare what we already knew about inequalities, i.e., that most learners in rural areas lacked access to education during the lockdown. Socioeconomic status still plays a major role in who has access to digital devices and internet connectivity. Government collaborations with mobile networks and ICT companies to provide access to online zero-rated educational resources did not benefit most learners in rural areas and townships that struggled to access online learning due to a lack of appropriate devices or not having internet connectivity. A similar conclusion was drawn from a study conducted by Ferri et al. (2020) regarding the need for digital devices coupled with stable internet connectivity to support learning across the divide. It was interesting to learn that having access to the most sophisticated devices does not guarantee automatic access to learning materials and uninterrupted learning; however, training on how to use these devices is important (Madida et al., 2019).

The problem was widespread, as the majority of teachers in many rural schools and township schools did not have technological devices and stable internet access to facilitate remote learning. Furthermore, many teachers who have access to such devices lack digital literacy skills and online teaching capabilities to confidently engage learners in online learning. This is in accordance with Maphalala, Mkhasibe and Mncube (2021) and Mohammad et al. (2012), where it was reiterated that the lack of effective training of teachers to be competent in using digital technology and the sceptical attitude of both teachers and learners towards the use of digital technology confirm the challenges faced by the digital immigrants described by Wang et al. (2013). In essence, the pandemic in South Africa generally exposed a lack of exposure to e-learning platforms, an inability to use teaching tools and a lack of development of online content and online strategies. Teachers and learners alike need to be empowered to become proficient in the use of computers and the navigation of digital platforms in which educational resources are posted. The digital

transformation in the education sector also requires that learners are taught how to navigate through digital learning platforms because many of them do not have access to the internet or a computer at home. Lack of training and technical support, therefore, remains a hindrance to online learning in the education sector. Chigona et al. (2010) urged policymakers and the government to expedite reform processes targeted at training teachers to use digital technology and dispel myths associated with sociological factors such as age and the personal experiences of teachers.

The findings of this study reveal that schools resorted to multimodal learning in the postlockdown period. As most learners returned to the classroom in August 2020 after the lockdown, in consideration of safety protocols, schools adopted various strategies including a rotational timetable to allow for adequate social distancing and phasing in of grade levels. To keep supporting learners, within a limited contact time, teachers had to adopt multimodal learning strategies such as WhatsApp prerecorded voice notes and messaging, which required minimal data usage through a cell phone and referrals to radio and TV programmes. This was done with an understanding that both learners and teachers do not have ubiquitous access to sophisticated technology and internet connectivity. In the midst of the pandemic, teachers made attempts to adjust their teaching modes under these constrained conditions.

There is a dearth of digital leadership when it comes to envisioning a digital future in schools beyond the constraints imposed by the COVID-19 pandemic. For technology to be adopted in schools, SMTs led by principals need to lead the digital transformation in schools by putting systems in place and motivating teachers to integrate technology in their classrooms. Schools have not taken on the responsibility to integrate e-learning into teaching and learning processes even after difficult lessons were learnt during the lockdown when the majority of learners were shut out of the learning process. Teachers are of the view that, at the school level, the principals and the SMTs must chart a way forward in embracing e-learning. School leadership could have considered recent disruptions in education as a learning curve and used this experience to chart a new path forward to promote the integration of technology into teaching and learning, starting with a cell phone as a basic tool for e-learning.

Schools require a universal LMS to support online learning. This platform would enable uploading and downloading of content, interaction amongst learners and between learners and teachers and administering assessments and grading. It would also allow teachers to do administrative work (generating class lists, record keeping, etc.). The LMS in essence would allow teachers to consolidate all teaching and learning activities and resources into one portal and avoid multiple logins to access learning materials.

7. Conclusion

South Africa is one of the world's most inequitable societies, with extensive disparities between rich and poor people. The socioeconomic status of the learner should not play a role in who has access to education. Education is a basic human right, and all learners must be able to access the best learning opportunities available regardless of economic barriers. The problems facing education in South Africa are not new, and digital teaching alone is never a magic bullet. Simply handing out access to data and computers cannot solve all of the very real and entrenched problems in South African society. Both teachers and learners need to be proficient in the use of technology. SMTs led by principals need to be trained to enable them to lead in digital transformation in schools by putting systems in place and motivating teachers and learners to embrace online learning. Digital transformation requires infrastructure, which unfortunately is not available in poor communities, whose only struggle is survival. The challenges in the education system need a multistakeholder approach to be addressed efficiently and effectively. Digital platform players have a pivotal role to play in bridging the digital divide in South Africa. The lessons learned from this crisis can empower us all to chart a new path forward to create cultures of learning that provide kids with the competencies they need to succeed in a postpandemic world.

References

Abdullah, F., Ward, R. & Ahmed, E. (2016). Investigating the influence of the most commonly used external variables of TAM on students' Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) of e-portfolios. *Computers in Human Behavior, 63*, 75-90. https://doi.org/10.1016/j.chb.2016.05.014

Agostinelli Jr, M. D. (2019). from distance education to online education: a review of the literature. Graduate Student Theses, Dissertations, & Professional Papers. 11335. Retrieved from https://scholarworks.umt.edu/etd/11335.

Aheto, K. (2018). Digital Device Ownership and Learning Environment Preferences of Students in South Africa and Ghana. *Turkish Online Journal of Distance Education, 19*(3), 93-111. https://doi.org/10.17718/tojde.445093

Aristovnik, A., Keržič, D., Ravšelj, D., Tomaževič, N. & Umek, L. (2020). Impacts of the COVID-19 Pandemic on Life of Higher Education Students: *A Global Perspective by Sustainability, 12*(20), 8438. https://doi.org/10.3390/su12208438

Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology, 3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

Butucha, K, G. (2020). Students Emergency Remote Learning Experiences during the COVID-19 Pandemic Lockdown in Selected University in Africa. *American Journal of Educational Research, 8*(12), 899-905.

Chigona, A, Chigona, W., Kayongo, P. & Kausa, M. (2010). An empirical survey on the domestication of ICT in schools in disadvantaged communities in South Africa. *International Journal of Education and Development using Information and Communication Technology (IJEDICT), 6*(2), 21-32.

Chisango, G., Marongwe, N., Mtsi, N. & Matyedi, T. E. (2020). Teachers' Perceptions of Adopting Information and communication technologies in teaching and learning at Rural Secondary Schools in Eastern Cape, South Africa. *Africa Education Review, 17*(2), 1-19. https://doi.org/10.1080/18146627.2018.1491317

Chuttur, M. (2009). Overview of the Technology Acceptance Model: Origins, Developments and Future Directions. Sprouts: *Working Papers on Information Systems, 9*(37), 1-21. http://sprouts.aisnet.org/9-37

Darling-Hammond, L. (2010). *The flat world and education: How America's commitment to equity will determine our future*. Teachers College Press, New York. https://doi.org/10.1177/003172171009100403

David, R., Pellini, A., Jordan, K & Phillips, T. (2020). Education during the COVID-19 crisis. Opportunities and constraints of using EdTech in low-income countries. Policy Brief. EdTechHub. https://edtechhub.org/wp-content/uploads/2020/04/education-duringcovid-19-crisis.pdf

Davis, F. (1980). A technology acceptance model for empirically testing new end-user information systems: Wayne State University Sloan School of Management in partial fulfilment of the requirements for the Degree of PhD in management.

Dube, B. (2020). Rural Online Learning in the Context of COVID-19 in South Africa: Evoking an Inclusive Education Approach. *Multidisciplinary Journal of Educational Research, 10*(2), 135-157. https://doi.org/10.17583/remie.2020.5607

Wang Q(E), Myers MD., & Sundaram D. (2013). Digital Natives und digital Immigrants. Entwicklung eines Modells digitaler Gewandtheit. WIRTSCHAFTSINFORMATIK. https://doi.org/10.1007/s11576-013-0390-2

Farahat, T. (2012). Applying the Technology Acceptance Model to online learning in Egyptian Universities. *Precodia-Social and Behavioural Sciences, 64*, 95-104. https://doi.org/10.1016/j.sbspro.2012.11.012

Ferri, F., Grifoni, O. & T, Guzzo. (2020). Online Learning and Emergency Remote Teaching: Opportunities and Challenges in Emergency Situations, MDPI, 2020. https://doi.org/10.3390/soc10040086

Jung, I. (2019). Introduction to theories of open and distance education. In Open and Distance Education Theory Revisited (pp. 1-9). Springer, Singapore. https://doi.org/10.1007/978-981-13-7740-2_1

Korkmaz, G. & Toraman, Ç. (2020). Are we ready for the post-COVID-19 educational practice? An investigation into what educators think about online learning. *International Journal of Technology in Education and Science (IJTES), 4*(4), 293-309. https://doi.org/10.46328/ijtes.v4i4.110

Kotoua, S., Ilkana, M. & Kilic, H. (2015). The Growing of Online Education in Sub Saharan Africa: Case Study Ghana. *Procedia - Social and Behavioral Sciences, 191*(2015), 2406-2411. https://doi.org/10.1016/j.sbspro.2015.04.670

Krueger, R. A. (2006). Analyzing focus group interviews. *Journal of Wound Ostomy & Continence Nursing, 33*, 478–481. https://doi.org/10.1097/00152192-200609000-00004

Kümmel, E., Moskaliuk, J., Cress, U. & Kimmerle, J. (2020). Digital learning environments in higher education: A literature review of the role of individual vs. social settings for measuring learning outcomes. *Education Sciences, 10*(3), 78. https://doi.org/10.3390/educsci10030078

Kvale, S. & Brinkmann, S. (2008). *Interviews: Learning the craft of qualitative research interviewing (2nd ed.)*. Sage Publications, Thousand Oaks, CA.

Lazarov, L. (2018). Education in the 21st century - pedagogical approaches In digital environment. 'e-teacher' information system. *Eastern Academic Journal, 2*(2), 13-25.

Letseka, M., Letseka, M. M. & Pitsoe, V. (2018). The challenges of e-Learning in South Africa. *Trends in E-learning*, 121-138. https://doi.org/10.5772/intechopen.74843

Mail and Guardian. (2016). Paperless Classroom Hasn't Taken off yet, (16 May 27) Retrieved January 13, 2021, from https://mg.co.za/article/2016-05-27-00-paperless-classroom-hasnt-taken-off-yet

Maphalala, M.C., Mkhasibe R.G., & Mncube, D.W. (2021). Online learning as a catalyst for self-directed learning in universities during Covid-19 pandemic, *Research in Social Sciences and Technology*, ISSN: 2468-6891. DOI: https://doi.org/10.46303/ressat.2021.25

Mensah. I. K. (2016). Perceived ease of use (PEOU) and Perceived usefulness (PU) of E-government services in Ghana: The moderation role of computer self-efficacy. *European Journal of Research and Reflection in Management Sciences, 4*(5), 39.

Mhlanga D, Moloi T. (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

Miller, J. & Khera, O. (2010). Digital library adoption and the technology acceptance model: a cross-country analysis. *The Electronic Journal of Information System in Developing Countries, 40*(6), 1-19. https://doi.org/10.1002/j.1681-4835.2010.tb00288.x

Mohammad J. R., Negah, A. & Kok-Eng, T. (2012). Technology in Language Education: Benefits and Barriers. *Journal of Education and Practice, 3*(5).

Mpungose, C. B. (2020). The emergent transition from face-to-face to online learning in a South African university in the context of the coronavirus pandemic. *Humanities and Social Sciences Communications, 7*(1), 1-9. https://doi.org/10.1057/s41599-020-00603-x

OECD. (2018). Teaching for the future: effective classroom practices to transform education. OECD Publishing, Paris, https://doi.org/10.1787/9789264293243-en.

Onguko, B., & Hennessy, S. (2010). Key past and current initiatives supporting the use of ICT in schools in Sub-Saharan African countries.

Padayachee, K. (2017). A snapshot survey of ICT integration in South African schools. *South African Computer Journal, 29*(2), 36– 65: https://doi.org/10.18489/sacj.v29i2.463.

Sikhakhane, M., S. Govender & Maphalala, M.C. (2020). Investigating pedagogical paradigm shift in the 21st-century teaching and learning in South African secondary schools. *International Journal of Education and Practice, 8*(4), 705-719. https://doi.org/10.18488/journal.61.2020.84.705.719

Sumak, B., Hericko, M., & Pusnik, M. (2011). A meta-analysis of e-learning technology acceptance: the role of user types and e-learning technology types. *Computers in Human Behavior, 27*(6), 2067e2077. https://doi.org/10.1016/j.chb.2011.08.005

United Nations. (2020). Policy Brief: Education during COVID-19 and beyond. Accessed from https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/08/sg_policy_brief_covid-19_and_education_august_2020.pdf on 19/01/2021

Van Deursen AJ, & van Dijk, J. A. (2019). The first-level digital divide shifts from inequalities in physical access to inequalities in material access. *New Media Soc, 21*(2), 354–375. https://doi.org/10.1177/1461444818797082

Wetering, M., Booij, E., & Bruggen, W. W. V. (2019). Education in an artificially intelligent world - kennisnet technology compass 2019-2020.

World Bank. (2020a). Guidance Note on Remote Learning and COVID-19 (English). Washington, D. C: World Bank Group. Accessed 11/01/2021 available from http://documents.worldbank.org/curated/en/