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# Mitigating the digital divide in the South African higher education system in the face of the Covid-19 pandemic

## Abstract

*Access to higher education has been one of the critical areas of concern in South Africa, particularly for students from disadvantaged backgrounds. The Corona-virus (Covid-19) pandemic has brought the systemic cleavages into sharp relief, with 'access' and subsequent 'success' emerging as an important variable. Availability of digital facilities and internet connectivity have been important factors in enabling participation in higher education during the Covid-19 pandemic. The advent of the pandemic has, however, brought a new context to the challenges of higher education access, deepening the precarious position of students from disadvantaged backgrounds. Thus, online teaching and learning intensified the digital divide between the 'haves' and the 'have-nots', exacerbating the already existing inequalities in the South African higher education system. The paper reflects on the question of how digital divide and access to learning infrastructure exacerbated inequality among students during the Covid-19 pandemic in South African higher education. This question is particularly important, given the rapid digitalisation of the curriculum that many South African institutions are still struggling to align with. This paper aims to interrogate the implications of the Covid-19 pandemic on South African higher education, highlighting the challenges of the digital divide and access to learning infrastructure using a social justice approach. The article draws on the work of Fraser (1999), which refers to the idea of social justice as distributional justice, re-allocating resources accessed solely by the privileged to the historically disadvantaged. It also aims to understand how the typology of inequality across the differentiated institutions affected the delivery of education during Covid-19. This is a qualitative research based on both secondary and primary data exploring official documents, statistics and published materials. The article argues towards a comprehensive and inclusive digital learning strategies with substantial coordination both from government and non-government stakeholders. It recommends that digital pedagogy and online platforms of learning should become an integral element of South African higher education services to ensure the continuity of education; this is necessary to avoid similar difficulties if crises that restrict physical movement occur in the future.*

**Keywords:** digital divide, social justice, higher education, South Africa, Covid-19 pandemic

## 1. Introduction

The Covid-19 pandemic has significantly impacted the socio-economic and political landscape of countries throughout the world. Even though the severity, effects and consequences of the pandemic are yet to be understood properly, it has already affected various sectors and created a new order that is complex and uncertain. Since the outbreak in late December 2019, Covid-19 has wreaked havoc across the world in critical sectors, including higher education. According to the April 2020 World Bank report, by that time, 175 countries had closed their higher education institutions, affecting a student population of over 220 million (World Bank, 2020). The South African higher education institutions and their students have also been deeply affected by the Covid-19-related lockdowns. The pandemic led to a nationwide shutdown of face-to-face services, with online remote learning being implemented to avert the ensuing educational crisis. Social interaction has since been restricted to varying degrees because of lockdown requirements, including social distancing. These have resulted in unprecedented challenges associated with the physical meeting of students and lecturers at higher education institutions. Essop (2021) notes that over 800 000 students enrolled at the 25 campus-based public universities and 100 private higher education institutions in South Africa were directly affected when institutions halted face-to-face interaction because of the lockdown. This paper aims to understand the implications of the Covid-19 pandemic on South African higher education, highlighting the challenges of the digital divide and access to learning infrastructure.

Following the outbreak, higher education institutions in South Africa had to amend their teaching and learning strategies. Innovations aligned to global trends were adopted by the sector so that institutions could still meet their academic targets. Reflecting on the context of transition, Ahmad (2020) states, "We are entering uncharted territory and working with countries to find hi-tech, low-tech and no-tech solutions to assure the continuity of learning" (Ahmad, 2020: 11). Many universities in South Africa were not ready for a complete transition from face-to-face teaching to online systems, because they did not have the infrastructure or resources to facilitate a complete switch to virtual delivery immediately (see Kele & Mzilen, 2021; Menon & Motala, 2021). This was especially difficult for public universities that had practised face-to-face and web-enhanced teaching modalities and had little experience of teaching online. There were therefore detrimental consequences when higher education institutions embraced the new normal – that is, teaching and learning online, and meeting and collaborating from a virtual office via Zoom, MS Teams, Skype, Google Classroom and WhatsApp (Essop, 2021).

Despite known challenges such as a lack of information and communication technology (ICT) infrastructure, excessive data costs and a shortage of resources (such as electronic devices), higher education institutions were forced to move to online delivery or emergency remote teaching in response to the lockdown caused by Covid-19. Although online teaching is a well-planned activity, emergency remote teaching refers to a temporary shift of instructional delivery to an alternative mode of delivery due to crisis circumstances. Such teaching involves the use of fully remote solutions for instruction or education that would otherwise be delivered face-to-face or as blended/hybrid courses that are anticipated to return to normal once the crisis/emergency has abated (Hodges & Fowler, 2020: 1).

In emergencies, higher education, as in the case of the Covid-19 pandemic, generally rely on basic technological access (Mpungose & Khoza, 2020). However, in such emergencies,

students from disadvantaged backgrounds are vulnerable, and access to technology for higher education training is not easily affordable. The paper draws on the notion of the 'Pedagogy of the Marginalized' (Cross & Atinde, 2015), defining disadvantaged groups. Cross and Atinde (2015) define 'marginalized' or 'disadvantaged' groups within the context of South Africa as "those individuals or social groups who, by virtue of their race, gender, geographical location (rural, township or poor neighbourhood), etc., have historically been placed on the margins or periphery of the mainstream social and economic hierarchy" (Cross & Atinde, 2015: 308). This includes students from low-income families, rural or township areas, and with a multidimensional suite of constraining factors when accessing and participating in higher education. Thus, the precarious position of students from disadvantaged backgrounds during the pre-Covid-19 era has amplified several challenges that embrace the students' broad economic and social experiences; these have manifested in diverse forms of academic exclusion.

The issue of access to higher education has always been one of the critical areas of concern in the South African higher education system, particularly for those from disadvantaged backgrounds (Menon & Motala, 2021). However, the advent of the Covid-19 pandemic has brought a new context to the challenges of higher education access, deepening the precarious position of students from disadvantaged backgrounds. Digital learning platforms have not been fully accessible for many students, especially those from low-income backgrounds. At this crucial juncture, teaching and learning online have thus intensified the digital divide between the 'haves' and the 'have-nots' and has exacerbated the already existing inequalities in the South African higher education system (Essop, 2021). The impact has been the most severe for institutions working with poor and historically disadvantaged students. Furthermore, the pandemic has underscored the reality that the South African higher education system is fragile and not uniformly resilient. The notion of resilience is central here as it emerges from the interrogation of approaches to technology in higher education that have come to the fore as a result of Covid-19 and the associated challenges.

Several pressing and critical questions need to be addressed, including how to reinforce alternative teaching methods and delivery structures – notably, many South African institutions are still struggling with the rapid digitalisation of the curriculum to ensure alignment with the latest digital era. Thus, critical reflection on the challenges caused by the digital divide in South African higher education is needed. The article aims to interrogate the implications of the Covid-19 pandemic on South African higher education, highlighting the challenges of the digital divide and access to learning infrastructure within a social justice context. It also aims to understand how the typology of inequality across institutions has resulted in the differential delivery of education during Covid-19.

The article draws on the work of Fraser (1999), who refers to the idea of social justice as distributional justice, reallocating resources accessed solely by the privileged to the historically disadvantaged. The transition of teaching and learning from face-to-face to an online platform during Covid-19 restrictions brought the discussion of a digital divide between the haves and the have-nots, i.e., the question of access, distribution of education resources and outcomes for different groups, particularly the marginalised and disadvantaged. The notion of social justice also includes the concepts of inclusiveness and equity. The social justice framework informs South Africa's higher education approach as Bell (1997: 3) notes, "The goal of social justice education is full and equal participation of all groups in society that is mutually shaped to meet their needs."

## 2. Methodology

The sudden shift to online learning during the Covid-19 pandemic has created a new order that is complex and uncertain. Various national and international institutions have tried to document the numerical implications of the pandemic, generating various data sets on access to digital facilities and learning infrastructures during Covid-19. This study is a qualitative research based on both secondary and primary data, exploring official government documents, statistics and published materials. This study utilised data sets and statistics from the Council on Higher Education (CHE), Department of Higher Education and Training (DHET) reports, universities' annual and quarterly reports, the South Africa General Household Survey, and other national reports on Covid-19. It also involved keeping a weekly diary of significant events during the lockdown, constructing a written account of institutional experiences regarding the pandemic and meanings attributed to the experiences.

## 3. Internet access and digital learning in South African higher education

According to Datareportal (Kemp, 2021), South Africa is one of the most urbanised countries in Africa, with 67.6% of the population living in urban centres (Kemp, 2021). Yet, the Gini inequality index indicates that South Africa is ranked among the countries with the greatest and most persistent inequality rates in the world (World Bank, 2020). This is also strongly reflected in South Africa's stubbornly high inequality between urban and rural areas, despite government efforts to eradicate this disparity (Murahwa, 2019). Adding to the challenges in the higher education space, many of the students from disadvantaged backgrounds arrive from rural regions of South Africa such as Limpopo, Mpumalanga, the Eastern Cape and North-West Province. Developments in the past two decades – including the introduction of 'free' higher education for students from disadvantaged communities – have dramatically increased the number of students from designated (black, coloured and Indian) groups (Cross, 2018). Yet, despite huge investment and numerous initiatives, there continues to be a significant lack of academic achievement by students from historically disadvantaged backgrounds (Essop, 2021).

The South African higher education system has also made significant progress on the expansion of its ICT and digital learning since the 1990s (Basol, Cigdem & Unver, 2018); yet access to these facilities has generally been confined to campus spaces. Both the White Paper 3: A Programme for the Transformation of Higher Education of 1997 and the National Plan for Higher Education published in 2001 acknowledge the key role of the ICT revolution in South Africa. The National Plan explicitly notes the critical and central role that higher education needs to play in contributing to the development of an information society, both in terms of skills development and research (Czerniewicz, Ravjee & Mlitwa, 2006). However, a common thread underpinning all these strategies is that they have remained campus-centred and have given little consideration to student learning beyond the boundaries of the university campus.

Difficulty with internet access is one of the barriers to expanding the availability of higher education learning beyond campus spaces. Despite South Africa having one of the highest internet penetration rates in Africa (64.0% in January 2021), the majority of this access are accounted for by metropolitan households (Kemp, 2021). The internet penetration rate is calculated as the percentage of the total population of a given country or region that uses the internet in a given period (Soomro *et al.*, 2020). Thus, connectivity is still skewed towards urban

areas, while it remains a significant challenge in rural regions, with Limpopo Province being the lowest at just 43% (Kemp, 2021). A significant proportion of the historically disadvantaged students in South African higher education live in such rural areas.

Digital technology and ICT facilities provide a comprehensive set of technological tools and resources used to create, communicate and manage information. Besides internet connectivity and access, technologies include radio, television, telephone, satellite systems and computer devices (Owusu-Ansah, 2013). Within the context of higher education services, internet connectivity and digital facilities (including smartphones and computers) are particularly important indicators of relative access to online learning platforms and digital facilities; they can therefore highlight inequalities in digital access. However, inequality in skills levels of internet users also creates uneven access to digital learning. The transition to virtual platforms without equitable access to skills and ICT facilities during the Covid-19 lockdown has deepened the already existing inequalities among the country's diverse groups of students. The inequality has also been manifested across South African academic institutions, as they have shown different levels of readiness for the transition to online education.

The introduction of ICT infrastructure and digital facilities in higher education has profound implications for access, equity, management, efficiency, pedagogy (method and practice of teaching) and quality of online teaching and learning (Soomro *et al.*, 2020). Even though several higher education institutions in South Africa have made significant progress in building ICT infrastructure, the efficiency of digital pedagogy at many of them is still poorly developed. Several pedagogical challenges are associated with the relocation of course content to an online platform. The recent emergency re-alignment – very often by trial and error – of existing courses for South African higher education institutions into a logical structure suitable for online education has not always been accompanied by suitable pedagogies and methodologies. Course structure had been neglected and remained severely undeveloped, despite the need for revision, given the country's history. South African universities are still struggling with anomalies relating to alternative teaching methods and delivery structures, particularly with the rapid digitalisation of the curriculum. In other words, many institutions are still struggling to align with the latest digital era (Fourth Industrial Revolution). Given that most academic staff had had little, if any, experience or training in the pedagogy or delivery of online learning, during the adjustment to the pandemic, the academics with teaching responsibilities quickly had to upskill and familiarise themselves with online learning platforms (and all that entails – including increased administration tasks).

While the Covid-19 pandemic has put enormous pressure on South African higher education institutions (that is, adapting to remote and digital learning), it has also fast-tracked the adaptation necessary to align to 21<sup>st</sup>-century needs. Calling for quick adaptation on the part of educational systems, the catalytic impact of Covid-19 can thus be viewed as beneficial to South Africa's educational landscape in the long run, especially considering the growing pressure to digitalise learning (Olugbara & Letseka, 2020). Given that the virus had a ripple effect from starting point(s) that spread to the global scale, higher education has had to embrace this reality, and further accept that the legacy of the Covid-19 crisis will be with us for years (perhaps even decades) to come. Thus, it is paramount to reflect on pedagogical practices in creating and maintaining a sustainable and responsible environment that promotes the digital learning skillsets of the higher education community – arguably part of their responsibility as digital citizens in the 21<sup>st</sup> century.

#### 4. The challenges of the digital divide in South African higher education

Accessing ICT facilities and digital platforms from home during the Covid-19 pandemic has been a privilege accessible to those who can afford to pay for services (Soomro *et al.*, 2020). Thus, at this crucial juncture, both online teaching and learning at many South African higher education institutions have deepened the digital divide between the 'haves' and the 'have-nots'. The term 'digital divide' was first coined by a former United States Assistant Secretary for Commerce for Telecommunications and Communication, Larry Irving, Jr, referring to the uneven distribution and access to ICT infrastructure in societies (Dragulanescu, 2002). The concept has been used to explain the gap that exists between those with and without access to ICT and digital facilities (Paul, 2002). The notion of digital divide can also be narrated within the social justice framework, since, at its core, social justice is about the fair distribution of opportunities including digital facilities as they become a decisive factor to access learning facilities (Fraser, 1999).

The notion of the 'digital divide' does not, however, fully explain the complete spectrum of inequality across socio-economic lines in societies, as it is often conceptualised in binary terms positioning individuals as either having or lacking access. The skill and capacity of each user to make the most of different forms of ICT are as important as access itself. There is a strong correlation between the digital divide and other forms of social inequality. Generally, the highest levels of digital exclusion are found in the lowest income sectors. Some scholars (see Hargittai, 2003; Van Deursen *et al.*, 2017), prefer to use 'digital inequality', as it refines the understanding of the digital divide as a spectrum of inequality across diverse segments of society, depending on differences among several dimensions of technology access and use. These dimensions include race, ethnicity, gender, settlement pattern, economic status and class. However, both concepts; that is, divide and inequality, emphasise the uneven access to and use of digital facilities and internet connectivity based on people's pre-existing and deeply embedded socio-economic and cultural contexts (Beunoyer, Dupéré & Guitton, 2020). A comprehensive analysis of the digital divide indicates that it is not an independent phenomenon, but a variable that reflects socio-economic inequalities in areas such as education, health, employment, and access to knowledge bases, to mention but a few (Van Deursen *et al.*, 2017).

Narrowing the digital divide could play a crucial role in the development of emerging economies such as South Africa because it can enhance socio-economic equality, further social mobility and improve innovation/economic growth (Shenglin *et al.*, 2017). African countries, however, have an especially long way to go towards ensuring affordable access to internet and ICT facilities. According to the 2019 World Bank report, with the current average broadband penetration rate of 25%, Africa needs to invest an estimated \$100 billion in the next decade to achieve universal access (World Bank, 2019).

In the aftermath of the Covid-19 lockdown, South African higher education has become one of the sectors in which the digital divide is the most evident. This is displayed via a wide variety of challenges linked to the deeply rooted legacies of apartheid and its policies of dispossession. These set the context of inequality regarding access to technology in South Africa. The nature of higher education institutions in South Africa is also reflected in the deep-seated inequalities between the historically 'white'/advantaged institutions and 'black'/disadvantaged institutions (Essop, 2021). As argued by Mnguni (2016), universities are reflections of social experiences and as such the higher education system in South Africa

is also a reflection of the legacies of apartheid. When the National Party came into power in 1948, it created a racially segregated system. The extension of *University Education Act* in 1959 further proposed to have separate universities for black students and white students (Coetzee & Geggus, 1980). The Act was an extension of apartheid policy that excluded people according to race. The inequities of the apartheid legacy, represent serious obstacles to the effective delivery of higher education services to the disadvantage communities. Nevertheless, the Covid-19 pandemic further broadened the concept of access to embrace issues beyond the classroom (e.g., data and connectivity, electricity, access to appropriate technology, including basic living conditions, and the notion of 'home education'). While the responsibility for some of these aspects falls beyond the domain of higher education, Covid-19 has pointed out the need for agile synchronies and synergies across institutions and with other sectors.

Access to ICT infrastructure and/or digital facilities is also heightened by the historical inequalities and marginalisation of black students as a result of the legacy of apartheid. This is reflected in the findings of the Stats SA 2020 General Household Survey (GHS) report of students enrolled at 24 of the 26 public higher education institutions. According to the report, 16% of students have access to home Wi-Fi; however, only 7% of students benefitting from the National Student Financial Aid Scheme (NSFAS) which is a national funding agency, have access to home Wi-Fi, versus 33% of non-NSFAS students. Moreover, only 51% of NSFAS students own laptops versus 69% of non-NSFAS students (Department of Higher Education and Training [DHET], 2020).

The mechanisms for an emergency response to the challenges of the digital divide also highlight the infrastructural inequalities that exist between historically white urban universities and historically black rural universities (Czerniewicz *et al.*, 2020: 961). The former had the necessary technology and infrastructure to migrate systems to the online space, while the latter have been compelled to put their systems on hold during the Covid-19 pandemic. Thus, during the transition to online learning in the aftermath of Covid-19 lockdown, only students who have adequate psycho-social and material resources (and mostly from affluent backgrounds) have been comparatively successful at taking advantage of new forms of education. This is despite the universities' efforts regarding the systematic distribution of equipment (laptops or iPads), the allocation of data to minimise data and connectivity problems, and the use of available ICT, including Blackboard, MS Teams, Zoom and WhatsApp (Hodges & Fowler, 2020).

The uneven access to the internet at the household level has impacted online learning during the lockdown in many rural households. According to the 2020 General Household Survey (GHS) report of Stats SA, even though 63% of South Africans have access to the internet, mobile devices are the most-used means of accessing it by households, especially in rural areas. Nationally, internet access using mobile devices (58.7%) was much more common than access at home (9.1%), at work (18.6%) and elsewhere (10.7%) (Stats SA, 2020). Digital learning consumes comparatively large volumes of data as it involves accessing various audio-visual learning materials. Thus, affordability and cost of internet data become part of the equation when it comes to the digital divide. South Africa is still one of the most expensive countries in Africa in terms of internet data costs. For instance, mobile data in South Africa is ranked as the 16<sup>th</sup>-most expensive out of 45 countries in Africa, at \$6.81 per GB in 2020 (Research ICT Africa, 2020).

To alleviate the challenges of internet access at home for higher education students, the DHET negotiated with mobile network operators for reduced data rates for NSFAS students

to receive 10 GB daytime and 20 GB night-time data for three months (Tamrat & Teferra, 2020). Even if smartphones are essential devices for accessing information from the World Wide Web, they are not as effective as personal computers or laptops for teaching, learning and research in higher education. The distribution of personal computers among students in South Africa has also been amongst the lowest in the world (Essop, 2021). According to the 2020 National Survey by the DHET on 'Students' Access to and use of Learning Materials Survey Report', almost 20% fewer NSFAS students own laptops than non-NSFAS students, and 90% indicate that the device they own is a smartphone (DHET, 2020). The extent of the digital divide is illustrated by the fact that while 97.5% of students live in municipalities where more than 50% of households have access to electricity, of this group only between 10–20% of households have internet access and 30–47% of households have access to a suitable device (either a laptop or tablet, irrespective of whether shared or not) (Whitelaw *et al.*, 2020).

Before the Covid-19 pandemic, South African universities were largely unprepared for the sudden switch to online learning – not only in terms of digitalising course contents, staff training on digital pedagogy or online teaching, but also preparing students for a full transition to online learning and engagement. Face-to-face teaching and learning environments are synchronous (in real-time), and communication technologies are not necessarily required (see Kele & Mzilen, 2021; Menon & Motala, 2021). This method was the norm within the pre-Covid-19 context in higher education, even if the internet brought flexible access to study material. In contrast, web-enhanced teaching and learning rely on a learning management system (LMS) or web-based tools to upload resources for students. Students do not necessarily have the same level of competence and this varies based on their prior experience with technology in their households and schools. There are three tiers to digital skills – literacy, fluency and mastery (Chetty *et al.*, 2017). If a student is digitally literate, they can conduct basic functions using a range of technical tools, but to engage properly in virtual higher education learning spaces, fluency and mastery are required.

The actual engagement within the learning space depends on the ability of students to use the technology for learning. Despite most students in South Africa being 'digital natives' (Prensky, 2001) and experienced users of technology (Basol *et al.*, 2018), their proficiency is primarily at literacy levels, which may not aid much in understanding technology for digital learning (Nami & Vaezi, 2018). The proficiency is even worse for students from poor economic backgrounds who are not exposed to the digital platforms for learning until they join universities (Czerniewicz *et al.*, 2020). Bozkurt and Sharma (2020) argue that during any crisis or disaster, students will not necessarily remember the content delivered, but they will recall how they felt during interaction with their lecturers and peers and how they were supported during this period. The disparity among higher education students in terms of technology usage and skill for higher education virtual learning contributes to the challenges of the digital divide in South Africa. Students from disadvantaged backgrounds who do not have appropriate access to digital learning facilities or lack the resilience and engagement to learn on their own are at risk of falling behind (Schleicher, 2020).

Thus, the challenges of the digital divide in South African higher education are reflected through two interrelated factors. First is the unequal distribution of ICT infrastructure and digital facilities among students because of deep-rooted socio-economic inequalities. Higher education students from rural and disadvantaged backgrounds and communities have limited access to digital technologies owing to high costs and lack of infrastructure/ICT facilities, which creates unequal access to virtual learning. The rural population of South Africa comprised

on average around 33% of the country's total population in 2019 (Plecher, 2020), while in provinces like the Eastern Cape, Mpumalanga and Limpopo, the rural population and hence the population of students from rural areas are comparatively greater. Secondly, students from disadvantaged backgrounds often have inadequate skills levels and insufficient ability to fully tap into the benefits of digital learning. Students who are not exposed to digital learning platforms before joining universities are at a particular disadvantage. Providing state-of-the-art infrastructure in ICT technologies to students on campus has neither lead to an immediate adoption of such facilities, nor to conditions suitable for addressing the challenges of poor digital skills. Studies show that digital training is the crucial component in harnessing better use of ICT infrastructure investments made by higher education institutions (Chetty *et al.*, 2017).

## 5. Responses of South African universities to the digital divide

The introduction of digital and online learning in higher education systems is a journey that started in the early 1990s for many African countries. South African universities have also been trying to introduce e-learning to expand, access and keep up with innovative technological tools that will advance the teaching and learning experience. Online and distance education were already flourishing in parts of the South African higher education system long before the Covid-19 pandemic. Thus, the urgency of integrating digital technology into South African universities had been felt long before this time. For instance, with over 300 000 students, Unisa was already Africa's largest open-distance learning institution in 2016 (Queiros & De Villiers, 2016). Furthermore, the rapid improvement in access to internet connections over recent decades facilitated the process of information and knowledge-sharing among many higher education institutions in South Africa. Many universities in the country had also already introduced various kinds of online Learning Management Systems (LMSs) and digital strategies to optimise service delivery and upscale productivity (Mpungose & Khoza, 2020).

The Covid-19 pandemic has changed the context of online learning and digitalisation as it has compelled higher education systems to fully embrace virtual platforms that provide access for all to higher education services. Higher education institutions had to intervene with strategies to ensure that academic programmes could continue despite uncertain times. Nevertheless, the digital divide remains a major factor, limiting the feasibility of e-learning in South Africa. Studies highlight different response mechanisms that have been implemented to remedy the challenges of access to digital facilities and internet connectivity; hence, higher education institutions provide students with laptops and Wi-Fi access inside residences (Essop, 2021). The NSFAS has also initiated a business plan to facilitate the continuation of student funding, application queries, processing of appeals and general assistance. It has further ensured, during the Covid-19 pandemic, that students receive their allowances to which they are entitled to sustain themselves; continue with academic activities online; as well as to pay for learning materials. The reduced rates for data charged by mobile network operators noted earlier, as negotiated by the government (Tamrat & Teferra, 2020), went some way to addressing the access to data, even if more permanent solutions do need to be found.

The NSFAS has launched the Digital Learning Device Project, whereby NSFAS-funded students can apply to receive a laptop from their learning material allowance. Close to 50 000 laptops were distributed to NSFAS students at various universities (DHET, 2020). South African higher education institutions also adopted various strategies for remote multimodal teaching and learning during the period of the lockdown. Most institutions made swift commitments to do

what was feasible to make their systems equitably accessible to their students (Kele & Mzilen, 2021). This included providing free technological gadgets (computers/laptops, data and study material) to students from disadvantaged backgrounds, as well as the flexible application of assessment deadlines to cater for those who might have connectivity challenges in their communities. Despite these efforts, digital learning platforms have not been fully accessible for many students, especially from low-income backgrounds. Providing comprehensive and inclusive digital learning at little or no cost requires substantial coordination among government and non-governmental stakeholders to rally sustainably behind such tools and platforms.

The South African government has also managed to generate funding from international organisations such as the World Bank. A glimpse of the World Bank's portfolio on higher education indicates that Africa as a whole has been receiving the biggest slice in terms of higher education funding – US\$3.8 billion, with a total of about US\$9.8 billion investing in the sector globally. In January 2022, the World Bank also approved South Africa's request for a US\$750 million development policy loan. This loan is intended to support and accelerate the Covid-19 response mechanisms that maintain resilience and protect disadvantaged and vulnerable communities from the unfavourable socio-economic impacts of the pandemic (World Bank, 2022). The biggest challenge, however, remains the once-off/short-term modalities implemented by the Ministry of Higher Education, various agencies and higher education institutions to alleviate the digital divide. This approach to alleviating the crisis will not address structural and systemic concerns regarding the digital divide. Rather, policy measures and practices become fundamental in creating and maintaining a sustainable and responsible environment that promotes equal access to ICT infrastructure; the building of information literacy skillsets both of lecturers and learners is another crucial component of this sustainability. The latter is central to responsible roles as digital citizens in the 21<sup>st</sup> century.

While leadership at many universities worked hard to ensure that emergency remote teaching continued, the pandemic-driven shift to remote teaching and online learning has not been well-coordinated at many universities. Thus, for most institutions, the transition to emergency response teaching and multimodal remote learning systems was made with insufficient technical and digital pedagogical support (Kele & Mzilen, 2021). Higher education lecturers were expected to make a swift transition to emergency remote learning without a reasonable level of technical and digital pedagogical training. Nevertheless, each institution has taken a different strategy to the risk-adjusted, phased-in return, based on their context and readiness, and in line with their detailed institutional plans and strategies. A useful distinction has also been made between teaching with technology and teaching through technology (Schleicher, 2020). Lecturers who previously used technology to support face-to-face/contact teaching to construct engaging learning opportunities, no longer have the blended option when teaching online. In the latter context, lecturers had to teach largely through technology and consequently, the teaching and learning process has had to be rethought. In some cases, lecturers used alternative ways of teaching, conscious of the internet access challenges that students face (Menon & Motala, 2021).

Even though there has been a significant degree of adaptation and improvisation to ensure the continuity of teaching and learning, there have been severe budgetary, knowledge, skills and pedagogical constraints. Furthermore, the uncertainty as to how long the pandemic will last has a strong bearing on the ability to plan the academic processes. Even though providing immediate remedies for the digital divide, as well as access to requisite technologies and data as necessary conditions for virtual teaching and learning, these cannot be lasting solutions

to the digital divide. Instead, the service needs to be integrated into the operation of the higher education system. Strategies and interventions during Covid-19 should continue to be framed around supporting student challenges, which will, now need to extend not to the non-traditional student, but rather to the non-traditional space of learning. This underlines the call being made by higher education stakeholders for 'responsive universities' in the 21<sup>st</sup> century, whereby university programmes are connected more closely with the aspirations and needs of the broader communities they serve. This is especially relevant in mitigating the challenges faced by students from disadvantaged backgrounds. The ad hoc transition from face-to-face to online learning has caused a serious moral dilemma, yet there is a societal expectation not to disrupt the plans and academic careers of thousands of poor students (Menon & Motala, 2021). Thus, the challenges of access to higher education within the context of a pandemic ought to be conceptualised to expand digital and online facilities to all students beyond campus environments.

Higher education institutions have adopted different strategies to mitigate the challenges of virtual teaching and learning during the Covid-19 pandemic. Among others, this includes the preparation of course documents for online delivery, and the provision of supporting documents, resource packages and reading materials using virtual learning platforms. Moreover, addressing confusion associated with emergency learning is part of the mitigating process; as such, universities have set up hotlines and information centres providing up-to-date information for students and parents through frequent messages, explanations, questions and answers. More flexible approaches have been adopted reorganising assessment procedures (adjusting, annulling or rescheduling exams) to meet the demands of students. Lecturers have been encouraged to record their classes through automated video-recording venues so that students have flexible timetables to access lectures from home. As stated above, universities have also made large-scale data purchases for all students, identified digitally excluded students and tried to provide devices where possible. Emergency remote learning in South Africa has compelled the higher education sector to make changes that were long overdue by pushing the boundaries of students' ability to engage virtually with their learning. Nevertheless, the higher education system still needs to create a seamless system of student support and a comprehensive digital and ICT policy if no student is to be left behind. The paper explores the implication of the digital divide among various social groups in the South African higher education system on access to higher education services during the Covid-19 pandemic. It discusses the complex relationship between access to digital facilities and learning infrastructures, highlighting the challenges faced by both institutions and students from disadvantaged backgrounds. The paper recommends designing an all-inclusive digital learning strategy collaborating with both governmental and non-government agencies of education services. As such, digital pedagogy has to be mainstreamed in higher education services to ensure the continuity of education during similar crises that might restrict physical movement in the future.

## 6. Conclusion

The Covid-19 pandemic has brought a new layer of complexity to the higher education sector that demands a different dimension to the notion of access to higher education services. The traditional notion of learning through face-to-face classroom interactions has been significantly altered as virtual platforms have become the new normal. This has brought renewed discussion on digital equality and its effect on access to higher education services. Even though several

South African higher education institutions already had experience with both online and blended learning approaches before the Covid-19 pandemic, they were not prepared for the virtual transition of such magnitude. The prior experiences of virtual approaches were mostly campus-based or campus-centred and gave little consideration to student learning, particularly the dynamics beyond the boundaries of the university campus. Moreover, the competence and skills level required to participate fully in virtual learning and properly access knowledge from digital spaces are not at uniform levels among students; rather, these vary based largely on students' prior experience with technology in their households and schools. There are also challenges related to digital pedagogy, as most academic staff have little, if any, experience or training in the pedagogy or delivery of online learning.

The article has interrogated the implications of the Covid-19 pandemic on South African higher education, highlighting the challenges of the digital divide and access to learning infrastructure. The article has argued for comprehensive and inclusive digital learning strategies with substantial coordination both from government and non-government stakeholders. It has also been argued that digital pedagogy and online platforms of learning should become an integral element of South African higher education services to ensure the continuity of education; this is necessary to avoid similar difficulties if crises that restrict physical movement occur in the future.

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