



**Understanding the Impact of the Digital Divide and New Methods of Learning  
on Humanities Students at UKZN during the Coronavirus Pandemic**

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## DECLARATION

I, OYINKANSOLA OYINDAMOLA AKINLABI, declare that

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## **ABSTRACT**

Typically, the digital divide refers to the separation between those who have access to digital information and communications technology (ICT) and those who do not (Dewan & Riggins, 2005). However, more recently, scholars and thought-leaders have acknowledged that the concept is multifaceted and should consider various socio-political factors, as well as economic ones.

The University of KwaZulu-Natal (UKZN) is home to a diverse range of students of different genders, ages, socio-economic backgrounds, and racial backgrounds. The use of digital technology plays a huge role in the academic processes for students at UKZN. It is imperative that all students have access to, and are familiar with, digital technology to successfully complete their academic tasks. This became even more important in the wake of the Coronavirus pandemic, which made it necessary for most teaching and learning to be done virtually with the use of digital technology. However, just like in most communities, there is a gap between the availability of digital platforms and students' access, and their cognitive ability to use these platforms.

This research explores the experiences of UKZN Humanities students as they navigated their new level of dependency on digital technology for learning during the Coronavirus pandemic. It highlights how the digital divide has impacted their use of digital technology while learning virtually, their peculiar experiences and actions taken due to virtual learning, as well as how they compare virtual learning to contact learning.

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## CHAPTER 1: INTRODUCTION

The novel coronavirus (COVID-19) was discovered in Wuhan, China, in November 2019, leading to a global pandemic that affected most sectors of the global economy, including education. Like many learning institutions around the world, the University of KwaZulu-Natal (UKZN) tackled the restrictions imposed by lawmakers to curb the pandemic by transitioning to virtual teaching and learning methods. Because of the shift to virtual learning, it became imperative that all students had access to, and were familiar with, digital technology to meet their academic goals successfully. This research aims to understand the experiences of Humanities students at UKZN during the COVID-19 pandemic, where the shift to virtual learning highlighted the impact of the digital divide. The study explores the extent to which the digital divide affected students' use of digital technology and their adaptation to online learning compared to traditional face-to-face instruction.

As the COVID-19 pandemic disrupted classroom learning and accentuated digital inequalities, this research sheds light on these disparities and their implications. The researcher's personal experiences as a digitally literate postgraduate student at UKZN, combined with the challenges faced during the transition to online learning, have inspired this research to better understand the unique experiences of students in the context of virtual learning over the past few years. By engaging with these insights, this study contributes to the understanding of digital inequalities in South Africa, particularly in KwaZulu-Natal, and its impact on student learning.

The concept of the digital divide emerged during the early 1990s, and highlighted the gap between those who have access to, and proficiency in, information and communications technology (ICT) and those who do not (Dewan & Riggins, 2005). However, this divide is not a binary split but rather a gradation based on varying degrees of access and capability (Cisler, 2000). It encompasses differences in access to technology and individuals' ability to use technology effectively (Dewan & Riggins, 2005). This research delves into existing scholarly discourse and research on the concept to understand how it has evolved since the 1990s, and the impact it has in the world today.

In order to conduct this research, it was important to build on the foundation of related concepts and communication theories that apply to the digital divide in tertiary education. One key concept that this research examines is digital literacy, an ever-evolving concept. Digital literacy refers to the effective use of information and communication technologies (ALA, nd.), encompassing various skills and competencies, which are constantly evolving due to emerging technologies. This research discusses the differences between media literacy and digital literacy, terms sometimes used interchangeably, as well as the importance of constantly updating the practical skills and competencies linked to digital literacy to keep up with technological advancements.

The discussion of these theories is crucial as it provides a conceptual framework and enhances the validity and reliability of the study. This research builds on theories such as diffusion of innovations, social inclusion, self-efficacy, and network society. Many of the differences in access to, and the ability to use, digital technology can be attributed to the diffusion of innovations, as the process explains to the adoption or penetration of innovations and technological advancements, leading to social change (Al-Jabri & Sohail, 2012). This theory highlights how technologies are initially adopted by those with ample resources before those with fewer resources get a chance to adopt such technologies. In the context of this research, diffusion of innovations explains how earlier adopters of digital technology develop digital literacy and skills faster than late adopters. Therefore, even as the ownership gap reduces, the skill gap persists and may even increase with the introduction of new technologies (Compaine, 2001). Social inclusion, the process of improving the terms in which individuals and groups take part in society by improving the ability, opportunity, and dignity of those who are disadvantaged (World Bank, 2020), is a widely recommended means of tackling the digital divide caused by staggered diffusion, and it is discussed in detail in this research.

Furthermore, this research emphasizes the relevance of the self-efficacy theory as it explores the skill level required for using digital technology. In investigating the realities of the digital divide among the participants of this study, the researcher looked at how they perceive their digital skills, or their perceptions of self-efficacy. Bandura's (1986) self-efficacy theory suggests that perceived self-efficacy and outcome expectancies are key factors that influence behaviour. Self-efficacy thus reflects individuals' beliefs about their abilities, and influences their decision-

making, effort, persistence, and mastery of a behaviour (Sutton, 2002). Therefore, this study examines students' proficiency in using digital technology for online learning and their perceived outcomes, aligning with the principles of self-efficacy.

The network society theory also forms a critical backdrop for this research. A network society is a society whose social structure is made up of networks powered by ICTs (Castells, 2004). This definition accurately describes UKZN during the Covid-19 pandemic as it embraced virtual learning and required digital sociality from its staff and students. The intricacies of this concept are further discussed in Chapter Two.

Additionally, the literature review sheds light on the peculiarities of the digital divide in South Africa: the broader context of this research. The factors determined by existing research as contributors to the digital divide, as well as the initiatives that have been undertaken by the government and different organizations to bridge the divide, are discussed. The impact of the digital divide on education, particularly during the COVID-19 pandemic, is also examined. It is believed by some scholars that the digital divide widened as teachers incorporated technology-based learning into their daily curricula (Moore et al., 2018). This research, therefore, investigates these claims by discussing the virtual education experiences of educators and learners around the world in the second chapter, and among UKZN Humanities students in the fourth chapter. Moreover, the roles of higher education institutions and the government in bridging the digital divide in education are investigated and discussed.

Because the information used for this study relates to the respondents' personal experiences with digital technology and virtual learning, a qualitative approach was identified as the best fit for data collection. A case study approach was also adopted as a group of UKZN students belonging to the same school were sampled for this research, and their responses were not generalised for the entire UKZN population. To interpret the data gathered from participants, a thematic content analysis was employed to analyse answers and help understand the opinions and experiences with ICT use and virtual learning.

Overall, this research aimed to understand the learning experiences of Humanities students at the University of KwaZulu-Natal (UKZN) during the coronavirus pandemic in light of the digital divides that exist among them. Hence, the key research question of this study is: "How did

the digital divide and virtual learning during the coronavirus pandemic impact the learning experiences of Humanities students at the University of KwaZulu-Natal?”

This research question was answered by examining four key areas.

Firstly, this research considered the forms of digital divides apparent among students by examining the disparities in their levels of access and their ability to use digital technology for educational purposes. This helped determine whether access and ability-driven digital divides existed among the students.

Secondly, key differences in the learning experiences of students at UKZN during the coronavirus pandemic was investigated. This helped to determine what underlying variables came together to contribute to their experiences during virtual learning.

Thirdly, the research examined the perceived impact of the digital divide on virtual learning, and how students approached their academics as a result. This was done by asking students about their feelings and habits when using digital technology for virtual learning. Thus, the research determined how the digital divide affected academic behavioural patterns among students.

Lastly, students’ opinions and preferences on the new virtual learning dynamics at UKZN were assessed. Their perceptions of the benefits and pitfalls of contact and virtual learning was investigated. However, because virtual learning was a necessary experience that they all had to participate, recommendations on what systems could be put in place by the university and government to make virtual learning more feasible are also highlighted.

The discoveries made during the examination of the aforementioned concepts contributed to understanding the peculiarities of the digital divide, as well as its impact on education for these UKZN students during virtual learning. Thus, this research contributes to the digital divide discourse, especially in the context of higher education in South Africa. However, it is important to note that this research does not seek to generalize its results to represent the realities in the entire nation, but only to shed light on a relevant fraction of it.

## **CHAPTER 2: THEORETICAL FRAMEWORK & LITERATURE REVIEW**

### **2.1 Introduction**

Over the past few decades, information and communication technologies (ICTs) have become essential tools for communication and connection around the world. This has created a global virtual space, and technology users have had to learn to become ‘digital citizens’ (Isman & Canan Gungoren, 2014). Additionally, the ability to access computers, and the internet, has become increasingly important to immerse oneself in the economic, political, and social aspects of this world (Stanford, n.d).

The education sector is no different, as ICTs have become an integral part of formal learning. This became increasingly true during the Coronavirus pandemic, which left students with no choice but to “learn from home”. With social distancing as the primary countermeasure against contracting and spreading the virus, academic institutions worldwide had to suddenly shut down their campuses and transition to emergency remote teaching and learning (Stewart, 2021).

Despite the need for all students to have access to digital technology for learning, there exists a gap between those who could access it and those who could not; a gap referred to as the digital divide. This research aims to understand how the rising dependence on digital technology for learning amidst the existing digital divide affects students’ academic endeavours. Therefore, this chapter will address the characteristics and peculiarities of the digital divide by reviewing several scholarly views about the topic, and discuss the impact of ICT on higher education, especially in South Africa and the global South. The concept of the digital divide is discussed in detail below and lays a foundation for other related topics, and for the findings of this research.

The chapter will thus draw from the theories of diffusion of innovations, social inclusion and the network society. Each of these theories will be examined in terms of how they relate to the use of digital technology and the concept of the digital divide, and how they can be applied in the context of this study.

## 2.1 The World as a Network Society

Van Dijk (1991) and Castell's (1996, 2004) work on the network society focuses on how historical change was brought about by the advent of new information technologies, particularly those linked to communication. According to Van Dijk (1991), a network society is a society where individual and organizational structures are primarily shaped by a combination of social and media networks or as Castells (2004) describes them, "microelectronics-based information and communication technologies". Two specific features of the network society are 'space of flows' and 'timeless time'. This means that time and space as physical concepts still exist, but the limitations humans once had are becoming less apparent (Machado, 2017). The first feature, 'space of flows', is a concept that describes modern spatial existence, in which advanced communication technology causes social interactions to happen simultaneously, regardless of any physical distance between those who are communicating (Olivier, 2013). This can be seen in the effects of social media and communication platforms such as Instagram, WhatsApp, and Zoom, where quick and simultaneous conversations can happen in real-time, no matter where the participants are located. The second feature, 'timeless time', describes how the normal sequence of time has become less significant in certain contemporary processes, because technology has caused such processes to be instantaneous (Olivier, 2013). For example, financial transactions, job interviews and information sharing can now be done virtually within a fraction of the time they used to take.

The digital and network society have reshaped several organizational aspects of the world, with the process of literacy and learning being one example. The learning environment is ever-evolving, as virtual, network-based modes are rapidly impacting, and in some cases, replacing, physical learning methods (Volungevičienė et al., 2020). Within these online networks learning happens in new, timeless, and borderless spaces. In relation to this study, network theory helps to understand that the concept of society is now as real online as it is in physical spaces, and connectedness to an online (digital) society is fast becoming a prerequisite to living life 'normally' in the modern world. This is true of UKZN as well, as there is a degree of digital connectedness required to be successful as a student at the University. Examples of such digital platforms include Learn, the university's online learning platform that students use to complete their coursework, and UKZN's Research Information Gateway (RIG), the platform used by research students to apply for ethical clearance from the UKZN Research Ethics Office. As this chapter goes on to discuss several aspects of the digital divide, specifically in the context of education, it will be

shown how much the world has evolved into more of a network society in recent years, and how the dependence on digital and network-based spaces is a vital aspect of education and literacy.

## **2.2 Digital Literacy**

It is believed that digital literacy comes more naturally to individuals born in the digital age (from the 1970s), who have acquired and fine-tuned their ability to use and process digital information through years of interacting with digital devices such as mobile phones and videogames (Prensky, 2010; Dixon, 2014). However, not everyone under this demographic shares the same reality. It is important to examine the elements that contribute to ICT use and digital literacy, in order to better understand the concept.

According to Warschauer (2003), there are three important mode of access to new (digital) technology. The first mode is the device. Ownership of a computing device is vital for ICT access. However, device ownership does not guarantee complete access because full ICT access also requires connection to the internet, as well as the skills and understanding to use both the device and the internet in socially valued ways (Warschauer, 2003). The second mode is conduits or, more simply, connectivity. Whereas a device is a one-time purchase, access to a conduit necessitates constant connection to a supply line, such as electricity, telephone service, and Wi-Fi/data access (Warschauer, 2003). Literacy is the third model. While literacy is commonly defined as the ability to read and write, ‘new literacy’ theorists prefer a broader definition that takes into account the social contexts of literacy practice (Warschauer, 2003). Hence, being literate in this situation can be understood as “having mastery over the processes through which culturally significant information is coded” (de Castell & Luke 1986: 374).

This then leads one to consider the differences between various types of literacy in relation to digital technology. People often, incorrectly, use the terms ‘media literacy’, ‘information literacy’, and ‘digital literacy’ interchangeably. However, media literacy is an umbrella term that encompasses both information literacy and digital literacy, and covers a broad range of media forms (Aufderheide, 1992; Koltay, 2011). It describes the ability to understand, produce and convey meanings to various intricate symbolic texts, such as images, words, and sounds, whether they are presented through traditional or digital means (Aufderheide, 1992; Koltay, 2011).

On the one hand, information literacy refers to the ability to find, identify, assess, and use information to meet needs and solve problems (ALA, nd). Critical thinking and knowledge of procedure are key to information literacy, as these are needed to locate information in specific domains and contexts (Hobbs, 2006). In other words, information literacy calls for one to be well-versed in finding and applying relevant information for the specific tasks at hand, in their specific fields of interest. On the other hand, digital literacy often refers exclusively to the effective use of information and communications technology such as phones and computers, among others (Koltay, 2011). The American Library Association (ALA) defines digital literacy as “the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills” (ALA, nd.). This means that for one to qualify as digitally literate, they need not only know how to properly operate ICTs, but also how to think critically through the processes of creating and receiving meaning through them. The effective use of the aforementioned ICTs to communicate with others through the use of visual representations and digital texts, as well as the ability to evaluate and understand digitally conveyed information, all make for digital literacy (Bulger et al. 2014; Eshet-Alkalai 2004; Ng 2012).

In differentiating between media literacy and digital literacy, Canada’s Centre for Digital and Media Literacy proposes that “media literacy generally focuses on teaching youth to be critically engaged consumers of media, while digital literacy is more about enabling youth to participate in digital media in wise, safe and ethical ways” (Media Smarts, nd: para.6). Hence, digital literacy zeros in on the use of ICTs in ways that lead to measurable productivity, and is the focus of this research.

Unlike conventional literacy skills like reading comprehension, writing, and spelling, which are clearly defined, the abilities needed for digital literacy are varied and less precisely defined (Neumann et al., 2016). Even if it were easy to define these skills, they would need to be updated constantly as new technologies emerge. In an attempt to understand the skills required for digital literacy, Eshet-Alkalai (2004) proposed five ‘skill areas’ that users need to be competent.

Firstly, Eshet-Alkalai (2004) discusses photo-visual literacy, which involves the ability to read visual representations such as images, words, and the sound of digital text. One’s ability to interpret digital images, analyse their meanings, and utilize digital visual media effectively is a

crucial aspect of this literacy. It relies heavily on understanding visual cues and the user's proficiency in extracting contextual meanings from them.

Secondly, is reproduction literacy, which involves the ability to generate new or more wholesome information by incorporating pieces of different types of digital texts. Reproduction literacy is practiced, for example, in academic research writing. Academic research writing requires one to study existing texts (which in this case are in digital form) that speak to different aspects of a topic at hand, and then produce a new piece of writing that brings relevant fragments of such texts into one place. Thus, a student has the opportunity to navigate websites, online journals, and digital books in order to gather information that effectively conveys fresh insights or reinforces existing ones from a new standpoint.

Thirdly, branching literacy is the ability to navigate through non-linear texts in an efficient manner. Non-linear texts are characterized by a non-sequential structure, where information is presented in an inconsecutive fashion as opposed to being laid out straight and simple. Examples of this include being able to make connections between different statistics that have been researched separately but can come together to produce meaningful insights, or being able to establish the timeline of an event by examining different news articles online. Therefore, branching literacy, requires individuals to hone skills that help them move between and make connections between various digital information sources without getting confused, or losing sight of whatever goal they seek to achieve with digital information.

Fourthly, Eshet-Alkalai (2004) refers to information literacy, which is the ability to critically evaluate digital information. As earlier discussed, information literacy calls for one to be skilled in finding, consolidating, and applying relevant information. Such information could exist in different digital formats such as textual, video, or picture format, amongst many others, and so the understanding of the different formats is also crucial. The end goal of information literacy is to make decisions, solve problems and produce adequate results that satisfy the needs at hand with digital information.

Finally, is socio-emotional literacy, which involves the ability to effectively communicate with others using digital media by reading, recognizing, and appropriately responding to one's own and other people's emotions and feelings expressed digitally (Eshet-Alkalai 2004). Socio-emotional literacy is important because it is not enough to simply know how to create and

communicate through the internet, but one has to understand emotional cues as well. Emotional cues, such as nervousness, sadness, and fear, are visible and easily recognized in physical interactions. They are, however, more difficult to infer in digital interactions. Thus, socio-emotional literacy requires individuals to navigate and understand the nuances of non-verbal cues, such as the tone or pattern of messages, or more obviously, the use of emojis in chats to accurately grasp the emotional connotations conveyed through digital communication channels. Ultimately, socio-emotional literacy leads one to establish and maintain respectful digital (or internet based) relationships.

While these five areas do a good job of explaining the skillsets needed for digital literacy, they remain ‘areas’ and do not specifically point to practical, measurable skills and competencies. This is because as communication technologies evolve, there is an unavoidable advancement in the required practical skills and competencies to remain literate. The amount of knowledge that qualifies a person to be digitally literate today might not be sufficient, or might be completely outdated, in the near future. The continuous emergence of new information and communication technology calls for the continuous evolution of knowledge and access. Thus, digital skills and competencies need to be constantly evaluated and developed as a whole range of contemporary forms of communication (Buckingham, 2010).

This study is concerned with both digital literacy and access because studying the digital divide in terms of access alone does not yield the most realistic results that can help researchers understand the experiences of students. Therefore, I will attempt to discover the level of digital cognitive ability that UKZN students perceive themselves to possess, as well as their level of access to digital technology in its physical forms.

### **2.3 Self-Efficacy in Digital Literacy**

Self-efficacy theory (SET) is a branch of Bandura's (1986) social cognitive theory. Bandura (1986) defines self-efficacy as people's judgement of their capabilities to execute courses of action required to attain desired results. In other words, self-efficacy refers to how a person perceives or rates their ability to carry out a task and achieve a defined result (outcome expectancy). The self-efficacy theory states that perceived self-efficacy and outcome expectancies come together to determine behaviour (Sutton, 2002). Stated differently, self-efficacy is a form of self-evaluation

that inspires or prompts decisions about what behaviours to undertake, the amount of effort needed to persevere if challenges get in the way of such behaviours, and finally, the eventual mastery of said behaviour (Easton & LaRose, 2000). In any case, it is important to note that self-efficacy does not seek to measure skill; rather, it speaks more to perception of skill as it mirrors what individuals believe they can do with the skills they have (Easton & LaRose, 2000). In the context of this research, self-efficacy is a necessary backdrop that will help shed light on perceived student ability in digital and online learning.

Previous studies have demonstrated a significant correlation between self-efficacy and digital literacy. Their findings suggest that individuals with a greater belief or confidence in their own capabilities often exhibit greater persistence when addressing the challenges associated with solving digital information problems. (Ata and Baran, 2011; Adalier and Serin, 2012; Çakmak, 2010). In addition, students with high self-efficacy beliefs are known to be proactive and enthusiastic learners. Their self-efficacy strongly correlates with their motivation to explore new knowledge for personal pleasure and, ultimately, to achieve their academic goals (Ross et al., 2016). As was the case with UKZN during the coronavirus pandemic which necessitated online learning, self-efficacy in information literacy has become indispensable for students of higher learning institutions because they are required to be independent and self-controlled learners (Naveed & Mahmood, 2022).

Odede (2018) carried out a study to investigate information literacy self-efficacy (ILSE) in the use of electronic information resources (EIRs) by Library and Information Science postgraduate students in South-South Nigeria. The study revealed that there was a strong relationship between ILSE and students' use of EIRs. Students displayed a high level of self-efficacy and in turn, proficiency, in the use of ICTs to access e-journals, e-books, e-newspapers, and e-reference sources.

Zheng et al. (2020) also suggest that internet self-efficacy plays a crucial role in determining the quality of students' online interactions. Their study of students and teachers in Pakistan during the coronavirus pandemic established that there was a relationship between students' proactive personality, self-efficacy and online interaction quality. The study revealed that students' proactivity or lack thereof, had a significant impact on internet self-efficacy and online interaction quality. Furthermore, Hu and Hiu (2012) studied university students learning to use

Adobe Photoshop, a graphic design software, and found that computer self-efficacy affected students' participation, engagement, and learning effectiveness in technology-mediated learning groups, but its effects were less prominent in face-to-face learning situations.

In the bid to investigate self-efficacy in information literacy, Kurbanoglu et al. (2006) developed an information literacy self-efficacy scale (ILSES) which includes seven sections and 28 items. The seven sections are discussed below, using the example of a student who is tasked with writing a paper about the importance of different food groups in the human diet.

1. Defining an information need: This means that upon carrying out an information search, one must understand its purpose and end goal. The student in this example needs to understand why they are seeking the information needed, based on their own understanding of the task or instructions received. In this case, the student could identify a research question, such as “What is the importance of different food groups in maintaining a healthy human diet?” Thus, they recognize the need to gather information that can answer such a question.
2. Initiating the search strategy: This involves creating a plan to explore relevant information sources that can help answer the question at hand, and determining how best to find them. The student may decide to write out relevant search terms, identify some reputable nutrition blogs and websites, or visit a library with relevant books.
3. Locating and accessing resources: This involves the ability to effectively search for and access relevant information sources. At this point, the student in question may begin to use library databases and online search engines to retrieve relevant information about classes of food.
4. Assessing and comprehending information: This component involves the skills needed for evaluating the quality and relevance of information sources being explored, as well as the skills needed for comprehending and extracting useful information from those sources. Here, the student must think critically to identify reliable information sources and eliminate questionable ones. They must also be able to read/view and understand the information presented in the articles information sources.
5. Interpreting, synthesizing and using the information: This involves the analysis of information gathered, in order to extract and reproduce meaning from them. At this point,

the student highlights their most important findings, identifies patterns, and then combines to create the article they need to write. For example, information about each food group's nutritional composition, benefits, and recommended intake could be put together.

6. Communicating information: This involves the ability to properly package and share digitally created information, whether in oral or written form, using appropriate formats and channels. This is the point where the student in question communicates their research findings and insights through their written paper, making sure to answer the question that they started out with. Their thoughts must be well organized, and sources acknowledged correctly. Also, since the task is to write a paper, the student must know how to create a readable document, as opposed to a video file or any other presentation format.
7. Evaluating the product and process: This is the last component, and it focuses on assessing the process and outcome of the information-seeking endeavour. It serves as a revision of some sort, to ensure that the information-seeking behaviour adopted led to the discovery of relevant information, and the information gathered has contributed to delivering the right results. After completing the paper, the student in this example must evaluate the overall quality of their work, to make sure that their paper is coherent and it meets the requirements of the assignment.

Since its development in Turkey, the ILSES scale has been widely used to investigate information literacy self-efficacy (Mahmood, 2017).

While this dissertation does not replicate the ILSES, it adapts aspects of it to help understand how students relate to online learning, and their perceptions of proficiency when using digital technology. As the studies discussed above have shown that self-efficacy and outcome expectancies are key to the initiation and maintenance of behaviours that can make students fail or succeed in their online academic endeavours, this study seeks to shed light on how UKZN students perceive themselves, especially in the area of digital literacy. The study seeks to understand how students make decisions in relation to virtual learning and how these decisions influence their perceived skills.

## 2.4 What is the Digital Divide?

There is a widespread belief that global access to information and communications technology (ICT) would result in the emergence of a global community that facilitates interaction, commerce, and learning (Dewan & Riggins, 2005; Warschauer, 2003). However, researchers started to debate the actuality of a ‘digital divide’ between those who have access to ICTs and those who do not during the 1990s (Dewan & Riggins, 2005). Before then, the concept was referred to in less specific terms such as information inequality, information gap or knowledge gap, and computer or media literacy gap (Van Dijk, 2006).

The emergence of the term ‘digital divide’ was met with scepticism by some scholars. According to Gunkel (2003) the term ‘digital divide’ is ambiguous due to the sharp split it refers to. Van Dijk (2003, 2005) warned against some pitfalls of the term. First, the term suggests a simple divide between two clearly identified groups. Secondly, it suggests that the gap is difficult to bridge. Thirdly, the term leaves the impression that the divide is about absolute inequalities, that is, between those included and those excluded. A final inappropriate connotation might be the suggestion that the divide is a static condition while in fact the gaps observed are continually shifting. Despite these arguments, the term continues to be used in this form.

Van Dijk (2017: 1-2) recounts the progression of digital divide research as follows:

In the first years of digital divide research (1999–2002), the investigation of the concept concentrated on physical access: obtaining the hardware and software of digital media and a connection to the internet. After some time, communication and media scholars called attention to issues beyond access [...], Van Dijk (2005) used the term deepening divide to emphasize that the problem of digital inequality does not end after physical access has been attained but actually starts when the use of digital media is incorporated into daily life. In the decade between 2005 and 2015, the second-level divide became the focus of most digital divide research.

As scholars began paying attention to the disparity between access and use of ICTs, the “euphoric cyberbole” that characterized much of the rhetoric around computer technology since the mid-1980s began to wane (Gunkel, 2003:500). Then, it was typical to find that ICTs were celebrated for creating “a new world of limitless opportunity” that was free from pre-existing societal limitations such as geography, race and gender (Gunkel, 2003:500). However, the rise of

digital divide research caused numerous critiques to surface, challenging the previously held assumptions and revealing them as a utopian rhetoric that disregarded the constraints posed by limited access and varying levels of digital proficiency. (Gunkel, 2003).

In the years that have followed, several scholars, some of whom are discussed below, have worked to develop an appropriate definition for and understanding the digital divide. While some scholars define the concept of the digital divide from the perspective of access to ICT (NTIA 1999; Katz & Rice, 2002) others focus on the roles that both access and ability play (Norris,2001; Warschauer, 2003; Van Dijk, 2006).

The American National Telecommunications and Information Administration (NTIA) (1999) define the digital divide as the divide between those with access to ICTs and those without. According to this definition, access to technology is considered the primary determinant for social and digital development (Srinuan & Bohlin, 2011). A weakness of the NTIA's definition is that it implies that everyone has equal potential to use and benefit from ICTs, provided that everyone has access to them. However, without deliberate consideration of socio-economic and behavioural factors, a discussion of the digital divide is incomplete. Hence, this definition is inadequate.

According to Nielsen (2006), the digital divide refers to the fact that some parts of the population have significantly better opportunities to benefit from the new economy than other parts of the population. Hence, Nielsen (2006) views the impact of the digital divide from the angle of its relation to the economy, underscoring how the evolution of ICTs has significantly transformed global systems, thereby impacting business, labour and enterprise. For example, ICTs have made it easier for Small and Medium Enterprises (SMMEs) to compete with bigger-sized businesses because the former now have better access to information and networking (AlBar and Hoque, 2019). An example of this is seen where small businesses can now use ICTs to collect data that makes for better market research and business processes, or become visible to numerous potential clients through social media marketing. Nielsen's (2006) definition also suggests that access to ICTs does not automatically mean that its benefits would be derived. Though Nielsen (2006) does not directly talk about SMMEs in his definition, the terms he uses imply that one must consider the different variables that contribute to the digital divide, rather than just the issue of access.

Singh and Gangopadhyay (2017) define the digital divide as the gap between those who have capability and access to information by different means of ICT, and those who have neither

the capability nor access to such things. This definition sheds light on another problem in digital divide research – the assumption of a two-way split, bipolar societal split (Warschauer, 2003). According to Cisler (2000), the division between information haves and have-nots is not a simple binary split, but rather a gradation based on varying levels of access to ICTs. People do not merely fall into one of two categories. This is mainly due to the vast nature of digital technology, and the different kinds and levels of ability required to gain benefits from ICTs. There are too many variables to consider that prevent one from simply creating two groups based on people's access to, and knowledge of, digital technology. For example, the types of devices available, the software on those devices, varying degrees of knowledge of how to use these software, and overall productivity, among other variables, would have to be considered as they all contribute to digital access, digital literacy, and the digital divide. Hence, the digital divide refers to 'varying levels' of differences between those with access to, and ability to use, ICTs.

De Haan (2004) argues that there are three major shortcomings that affect most digital divide research. The first concern is that most studies present the concept of internet access as binary – assuming that people either use the internet or they do not– while neglecting the existence of different levels of access and use. The second concern is that digital divide research is mainly descriptive, that is, it highlights or seeks to establish a correlation between socio-economic factors and the ownership and usage of computers and internet connections. However, it overlooks other underlying issues that give rise to these disparities (de Haan, 2004). The third concern pertains to the insufficient attention given to the consequences of unequal or varied access to ICTs, and how these variations can either diminish, reinforce, or amplify pre-existing social disparities (de Haan, 2004).

De Haan (2004:68) argues that to overcome the binary definition of the 'digital divide', it must be replaced with a "multidimensional view" of access to ICTs. His model partitions access into three dimensions: motivation, possession, and digital skills. Motivation refers to attitudes towards ICT, or the interest and willingness of individuals to use technology and include it in their home, work, and educational efforts. Possession refers to the availability of equipment, such as where one has access, and provides a more concrete definition of access including physical access to ICT and the ability to use the technology. Digital skills refer to the extent to which prospective users can operate ICT, that is, the ability to use technology, and the degree of support available to

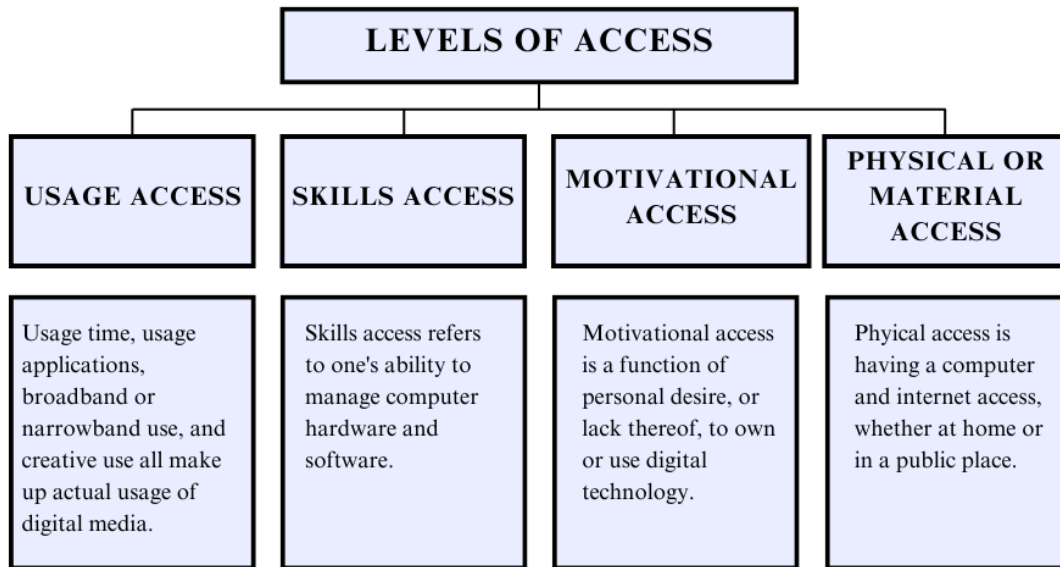
instruct individuals in its use. Furthermore, he explains that in order to overcome the focus on socio-economic predictors, researchers must look deeper into the more profound causes of unequal access to ICT. He also recommends that researchers shift their attention to investigating the behavioural consequences of these inequalities as a way to proffer solutions, rather than just investigating demographic-based differences in access between population groups (de Haan, 2004). This research reflects de Haan's recommendation, as it does not stop at demographic divides, but examines the digital divide among the students in light of deeper, unforeseen issues, and evaluates the effects of these divides on students' learning behaviours and outcomes.

With the introduction of new information and communication technology (ICT) innovations into the market, the adoption rates among individuals, organizations, and countries differ, resulting in variations in the level of access to these technologies. Even among the adopters, there varying levels of ability to use technology effectively exist (Dewan & Riggins, 2005). Hence, disparities in digital inequality must be considered in two major areas: access to technology and ability to use technology. The varying rates of adoption of ICT technologies is explained by the diffusion of innovations theory later in this chapter.

In terms of access however, Norris (2001) states that the access gap could also be understood to have three distinct aspects. Firstly, there is a global divide (referring to ICT disparities between countries). Secondly, a social divide (referring to the gap of ICTs between different segments of a society). And finally, a democratic divide (referring to the difference between those who, by choice, do or do not use digital technology to engage in public life) (Norris, 2001).

Van Dijk (2006) describes four levels of access: material, motivational, skills and usage access. As can be noted in Figure 1 below, material access is synonymous with access to devices and connectivity services, which were discussed earlier in this chapter. Motivational access represents the desire to have a computer and to be connected to the Internet. The factors that explain motivational access are both social/cultural and mental/psychological. Some individuals refuse to connect to ICTs for reasons such as perceiving no need for digital technology, lacking the time to use it, or holding negative views towards it (NTIA, 2000). Skills access is linked to digital literacy. Instrumental skills and operational skills represent the capacities to work with computer hardware and software respectively. In other words, if users do not have the requisite

skills to use technology, they will be dissuaded from engaging. The final level of access, as shown in Figure 1, is usage access, which can be measured in terms of usage time, usage applications and diversity, broadband or narrowband use, and, levels of active/creative use.



*Figure 1: Van Dijk's (2008) Four Levels of Access*

Bucy and Newhagen's (2004) proposal that media or technology access should be seen as a process with many social, mental and technological causes, and not as a single event of obtaining a particular technology supports Van Dijk's (2006) examination. The meaning of the digital divide keeps evolving over time, and is, according to Compaine (2001), 'a moving target'. It refers to different kinds of technological and societal differences, and its meaning is highly dependent on the context of its use. Hence, digital divide research is a continuous process of identifying the variables and contexts that a researcher wants to decipher and understanding that each of these different contexts could reveal results that are worlds apart. If there is one thing that remains true however, it is that the digital divide is very real and will continue to exist as long as humans continue to live in different social contexts. In the context of this research, the term digital divide is used to describe the varying degrees of physical access, ability, motivation, and reward that are characteristic of the participants. Thus, this dissertation will assess the different types of digital

divides among the students linked to physical access and ability to use ICTs that are relevant to online learning. Additionally, it will look at how the digital divide contributes to students' levels of motivation towards studying online.

## **2.5 Diffusion of Innovations and the Digital Divide**

The varying rates ICT adoption is explained by the diffusion of innovations theory. Diffusion is the process by which an innovation spreads through certain channels over time among members of a society (Rogers, 1986). The concept has long been of interest to sociologists and researchers, as it can have a significant impact on the way a society functions and the way individuals within that society think and behave. Diffusion leads to social change, that is, the process by which modification occurs in the structure and function of a society.

Rogers, in his 1962 book "*Diffusion of Innovations*," identified a number of key factors that influence the rate and success of diffusion: relative advantage, compatibility, complexity, trialability, and observability. Relative advantage refers to the perceived benefits of an innovation compared to previously existing alternatives. An innovation with a high relative advantage is more likely to be adopted quickly because it is seen as superior to what is currently being used. However, if users cannot identify any novel benefits or advantages that make the innovation better than what is already available, the adoption rate may be low (Rogers, 1962).

Compatibility refers to how well an innovation merges with the needs, values, experiences of potential adopters. For example, an innovation that is consistent with existing systems and technologies used among a group of people (such as a company) is easier to adopt. In addition, when an innovation is compatible with an individual's existing beliefs and practices, it is more likely to be adopted than one that requires significant changes to their current way of life (Rogers, 1962).

Complexity refers to the how difficult the use of an innovation is in comparison to its predecessor to achieve similar outputs. In other words, complexity addresses the level of difficulty in understanding and using an innovation. The more complex an innovation is, the more averse people might be towards it, and the slower it is likely to be adopted. This is because people

generally tend to adopt systems that are easier to understand and manage, rather than more difficult ones (Rogers, 1962).

Trialability refers to the extent to which an innovation can be tested on a small scale before people commit to fully adopting it. It is especially beneficial when an innovation can be tested through self-exploration, that is, with limited or no external instruction. This allows users to try out the innovation by themselves and with minimal external interference. Thus, the users can get more comfortable with the innovation as they explore it gradually (Rogers, 1962).

Observability refers to the extent to which the results derived from using an innovation can be seen others, that is, its visibility. When the results of an innovation are visible, more people can be influenced by the results being enjoyed by early adopters. This process is called social learning, an interactive process where individuals learn and develop new behaviours by observing, imitating, and engaging with others within a social setting (Wenger-Trayner & Wenger-Trayner, 2016). As people continue to observe the benefits that early adopters derive from an innovation, they tend to be more inclined to try it out themselves (Rogers, 1962).

There is ample evidence of diffusion in the way that ICTs continue to infiltrate and change different aspects of society. The diffusion of innovations and the digital divide are closely linked, as the latter can significantly impact the extent to which new technologies are adopted. For instance, individuals or communities with restricted technology access may not be able to learn about, try, or observe new technology, resulting in a slower diffusion process. Likewise, low affordability and availability of technology can negatively influence the adoption rates, especially within low-income or marginalized communities. (Digital Divide Network, n.d.).

An example of the relationship between the diffusion of innovations and the digital divide can be seen in the adoption of mobile phones. Zhou (2002) reports the early 2000s saw mobile phone technology being rapidly adopted in developed countries, but in developing countries, adoption was slower due to a lack of infrastructure and high costs. However, as this kind of technology became more affordable and accessible, the adoption rate in developing countries increased, eventually appearing to narrow the gap that varied adoption rates had created (International Telecommunications Union, 2015). For example, sub-Saharan Africa had a smartphone adoption rate of 62% in 2021, a rate close to those of earlier adopters like Europe (79%) and North America (82%) in the same year (Statista, 2022). Compaine (2001) argues that

those with abundant resources tend to be the initial adopters of technologies. These early adopters then lower the cost for those with fewer resources. As they continue to make purchases and, as newer models are manufactured, access becomes more viable to those who could not afford the initial investment. This highlights how the mobile phone adoption rate in developed and developing countries is gradually levelling out, as the required technology and infrastructure become more available.

In terms of infrastructure that supports technology adoption, developed countries often move faster than developing countries too. In developed countries where extensive ICT infrastructure (like servers, network towers, and data centres) exists, more effort is put into enhancing and expanding the infrastructure to support the growing demands of technology adoption, or discovering new technology. Conversely, developing countries are typically challenged with inadequate ICT infrastructure, which they remain trying to figure out as their developed countries expand in ICT adoption (Oluoch et al., 2016; Samarakoon & Ylianttila, 2019). For example, in developed countries like the United States or South Korea enjoy access to high-speed internet and cutting-edge digital infrastructure, while developing countries like Bangladesh and Nigeria struggle with limited or outdated infrastructure, weak internet connectivity and unreliable power supply. In countries like the former, individuals and organizations enjoy better opportunities to adopt ICTs for various purposes, while people in countries like the latter are limited in the benefits they can enjoy.

The implication of all these is that the initial adopters develop digital literacy and skills earlier and faster than late adopters. Hence, even when the gap in ownership of devices begins to narrow, the skill gap still exists, and may even increase further with the development of newer technologies (Companie, 2001). For example, some people are currently learning how to use desktop computers as late adopters of the technology, while earlier adopters have gone past that and are already learning how to use newer and more advanced devices such as iPads, which enable them to perform more advanced functions. This, therefore, means that the seemingly rapid pattern of diffusion of ICTs does not guarantee the closing of the digital divide, but may in fact, exasperate it.

Efforts to address the digital divide and promote the diffusion of innovations are being undertaken by governments and the private sector in different countries. Such efforts include

creation of policies and initiatives, providing access to technology and training programs, providing affordable technology and internet access, and so on (European Schoolnet, 2012). However, these efforts often face challenges, such as funding and sustainability, as well as the need to address underlying social and economic factors that contribute to the digital divide (Digital Divide Network, n.d.).

In South Africa, for example, one such initiative to bridge the digital divide is the Digital Doorway Project (DD). The Council for Scientific and Industrial Research Meraka Institute (CSIR), in collaboration with the Department of Science and Technology (DST) and The Rural Development and Land (RDL), initiated the Digital Doorway project with the aim of “providing people in rural and disadvantaged areas with computer equipment, and allowing them to experiment and learn without formal training and with minimal external input” (Smith et al., n.d.). The vision of the DD initiative is to make a notable difference in computer literacy and accompanying skills in South Africa, thereby making it possible for South Africans to participate in the information society (CSIR Meraka Institute, n.d.). The DD is a digital kiosk that contains four built-in computer screens and can be used to access pre-installed information sources and applications. The first prototypes were installed in communities like Uitenhage and Port Elizabeth in the Eastern Cape, in 2002 (Van der Vyver & Marais, 2015). The project followed an extreme constructivist approach called minimally invasive education, which required people to self-explore and learn to use the computers without receiving any guidance from an instructor (Fürstenburg, 2005).

However, a study by Gush and de Villiers (2011) which looked into DD user behaviour across three parts of South Africa showed that fundamental aspects such as a stable electricity, functioning terminals, and screen visibility had a major impact on the effectiveness of a site. The study recommended that site administration, adequate electricity provision, updated content and community awareness of the project should all be revisited at each site regularly, to ensure maximum benefit. Also, the location where the DD projects were initially established (Eastern Cape) may have contributed to its problems. According to Global Data Lab (2021), the Eastern Cape is among the least developed of South Africa’s nine provinces. It may have yielded more benefit to begin the DD initiative in a more developed province and take the lessons learnt from user behaviour into other less developed provinces. Since its inception, the South African

government and the CSIR have worked towards modifying the DD initiative by paying more attention to the peculiar circumstances and needs of different communities (Stillman et al, 2012). The DD initiative is proof that social and economic factors play a huge role in the success of initiatives that seek to bridge the digital divide by encouraging the diffusion of innovations. Thus, such factors should be thoroughly addressed by stakeholders both before and during the execution of such initiatives.

Overall, the diffusion of innovations and the digital divide are closely interconnected, as the latter has a significant impact on the adoption, use, and development of skills for new technologies. To promote the diffusion of innovations and address the digital divide, it is important to consider the social, economic, and cultural factors that impact access to technology and digital literacy skills.

## **2.6 The Digital Divide in South Africa**

Studies have been conducted to discover the types and causes of the digital divides which exist in different countries (Brandtzæg et al, 2011; Goncalves et al., 2018; Singh, 2004). These studies discuss the digital divide in terms of gender gaps, age gaps, racial segregation, lack of infrastructure, lack of ICT, and lack of government policies (Singh and Gangopadhyay, 2017). Africa, particularly sub-Saharan Africa, is usually regarded as one of the least technologically advanced regions in the world (Bornman, 2012; Jensen, 2006). This circumstance is primarily attributed to the inadequate and unreliable infrastructure across different parts of the continent. Nevertheless, internet use on the continent is rapidly increasing. The continent had around 570 million internet users in 2022, a number that has more than doubled since 2015, and 41 million of those users were from South Africa (Statista.com, 2022). It is projected that by 2025, Africa will have about 700 million internet users (Statista.com, 2022). However, this only about half of Africa's 1.4 billion population.

The International Telecommunication Union (2011, 2012) highlights some factors that influence ICT usage in Africa. Firstly, the cost of internet access is higher in African countries – such as South Africa's \$2.04/1GB – than in other parts of the world like Europe and Asia, which boast the cheapest internet costs in the world at less than \$0.20/1GB (Cable.co.uk, 2022). The relationship between education, income and Internet usage is greater for Africa than for most

developed societies. For example, Internet access and usage are largely a privilege of the wealthy and educated elite, as people in low-income families living in non-metropolitan areas are less likely to have access to the internet (Swenson & Ghertner, 2020). Gender also appears as an important factor that influences internet use in Africa. The Broadband Commission (2013) points to the fact that, whereas the gender gap is estimated to be only 2% in the developed world, 16% fewer women than men are Internet users. In Africa, gender differences are based on lifestyle and cultural beliefs (Gray, Gainous, and Wagner 2017). It is not unusual to find women in developing countries trapped in traditional family roles such as homemaking and raising children, thereby lacking educational exposure and the basic digital literacy skills that could allow them to accomplish more (Telecentre Women, 2012). The prevailing role definition in which a woman's purpose is predominantly seen as supporting and ensuring the family's wellbeing contributes significantly to the limited adoption of technology among women in Africa. (Johnson, 2012; Antonio & Tuffley, 2014).

Within sub-Saharan Africa, South Africa is often regarded as one of the most successful countries in terms of information integration, due to widespread mobile phone ownership, among other things (Bornman, 2016). South Africa accounted for 41 million (24%) of Africa's 570 million internet users in 2022 (Statista.com, 2022). Despite these numbers, the digital divide within the country is still quite evident as an uneven circulation of basic technological infrastructure persists across the country (Faloye & Ajayi, 2021).

According to Singh (2004), the foundation of the digital divide in South Africa is part of the remnants of inequality brought about by the legacy of apartheid and its separatist agenda. One such economic aspect is education. During apartheid, education in South Africa was racially segregated, with unequal access to resources, including technology, especially in rural areas (Makhado and Tshisikhawe 2020; Nyahodza and Higgs 2017). Non-whites were provided with inferior education, and poor (or no) access to proper infrastructure, thereby resulting in unequal opportunities for access to modern technology in the years that followed. These realities contributed to the digital divide in post-apartheid South Africa (Faloye & Ajayi, 2021). As a result, many non-white South Africans, some of whom are still living in extreme poverty, cannot afford devices, connectivity costs, or motivational exposure which could help them become digitally

literate (Singh, 2004). The existence of the digital divide however, is not only attributed to high levels of poverty, but also a lack of telecommunications infrastructure.

During the post-apartheid era, South Africa has acknowledged the existence of a complex digital divide that persists despite efforts to address historical inequalities (Fuchs and Horak, 2008). To bridge this gap, various initiatives, such as the establishment of technology centers and digital villages in townships and rural areas, have been implemented (Singh, 2004). An example of such initiatives is the Digital Doorway Project discussed earlier in this chapter. In addition, South Africa's Department of Basic Education has an extensive public works programme that uses funding from the private sector to sponsor the acquisition of technology skills and provide technological infrastructure, particularly in underdeveloped areas (Baskaran and Muchie, 2006; Lembani et al., 2020). However, such initiatives have suffered setbacks due to a lack of stable electricity and internet connection, inadequate support mechanisms, and lack of sustainability (Fürstenburg, 2005; Gush and de Villiers, 2011). To ensure successful outcomes, initiatives aimed at transforming people's environments necessitate a broad understanding of their present experiences. This understanding can be facilitated by actively engaging in discussions with those who are directly encountering the phenomenon (Nyahodza and Higgs, 2017).

The COVID-19 crisis, which made people more reliant on digital technology and internet access, has further amplified the digital divide in South Africa (Du Preez et al., 2020). According to a study, conducted by Krönke (2020), to determine household ownership of technological devices, 24% of South African respondents said they own a phone with no internet access and do not own a computer, while 4% own neither a phone nor a computer. This shows that in terms of access to the internet, a sizeable fraction of the South African population is still behind, which thus reflects a gap in digital literacy. These realities could be harmful to the country's chances at development and equality, particularly in terms of education and access to employment opportunities. The limited penetration of ICT impedes educational advancement and entrepreneurial activities, subsequently impacting the labour market and overall economic growth. (González-Sánchez, 2013).

These circumstances are despite the fact that the role of ICTs is highlighted in South African national and institutional policy documents for education, such as the National Research and Technology Foresight ICT Report (Department of Science and Technology, 2000), the

National Plan for Higher Education (Department of Education (DoE) 2001), the National Research and Development Strategy (Department of Arts, Culture, Science and Technology, 2002), and the White Paper on e-Education (DoE, 2003). These documents maintain that using ICTs will add value to education, improve teaching and learning and foster innovation (Czerniewicz & Brown, 2005). However, a lot still needs to change in the South African education sector if the full benefits of ICT-facilitated teaching and learning is to be harnessed.

Bornman (2016) expresses that infrastructure development and the reduction of ICT prices will probably be insufficient to transform South Africa into an information society because other more impactful factors contribute to the nation's ICT inadequacies. Hence, he recommends that comprehensive development across different segments of the population is crucial, not only for bridging the digital divide between South Africa and the developed nations but also for overcoming internal divisions within the country. This means that other social variables contribute to the South African digital divide, and if attention is not given to those aspects of people's lives, increased availability of ICT facilities will do little for the nation.

Studying the South African context, Faloye & Ajayi (2021) argue that, age, income, family background, urbanization, and a lack of infrastructure are some of the factors that contribute to the country's digital divide. Each of these factors are discussed below:

### ***2.6.1 Age***

Older people who encounter digital technologies later in life are often challenged by their complexities (Pierce 2019) and thus have less attraction to them. However, many people in older age groups have either been exposed to prior versions of ICTs, and some of them have not adjusted to newer versions because their needs may not have evolved. A significant percentage of people aged 50 and over are less likely to use modern technologies because they believe that their traditional devices, such as first-generation mobile phones and landlines, are sufficient (Faloye & Ajayi, 2021). According to Statista.com (2022), 17% of South Africa's population is above age 50. Thus, some members of this age group, who are not technologically savvy, contribute to the digital divide. Additionally, age may not be an isolated factor in itself, as it is closely linked to income. South Africa's older population consists of black people who were born before and during the apartheid era, some of whom have suffered or are suffering from poverty. These lower earners

may be unable to put their money on advanced digital technology and settle for simple devices, thereby limiting their digital literacy.

### **2.6.2 Income**

Investment in ICT is almost impossible if people's income is not enough to provide for their basic needs (Foko et al., 2017). Given the rates of poverty on the African continent (Alimi & Okunade 2020), many households cannot afford basic technological devices and connectivity costs which could help them participate in the information society and bridge the digital divide.

### **2.6.3 Family Background**

Bornman (2016) found that students whose parents are in white-collar professions and students from families with a higher socio-economic status tend to demonstrate a higher level of computer knowledge. Many of these students have daily exposure and engagement with ICTs. In contrast, students or individuals from homes whose parents perform blue-collar jobs, are retired, or are unemployed often have low levels of digital knowledge, because their parents often lack the resources to acquire basic IT devices (Ejemeyovwi et al, 2020). In a study among students at South African universities where Internet access was available on campus, Oyedemi (2009, 2012) found that white students had more access to Internet at home than other groups. He expressed that access to ICTs at home allowed people to make fuller use of the resource. While his study speaks of race, it also confirms that family background, and what happens at home, contribute to levels of exposure to digital technology.

### **2.6.4 Urbanization**

Urbanization refers to the population shift that occurs when individuals migrate from rural to urban areas, most often among young people (Faloye & Ajayi, 2021). People who grew up in urban areas or move to such areas are likely to be more exposed to technology than those in rural or underdeveloped areas, thereby having an advantage over their rural counterparts (Faloye & Ajayi, 2021). This is because ICTs spread faster and are more heavily relied upon in urban areas, due to the saturation of higher income individuals and businesses in these areas.

### **2.6.5 Lack of Infrastructure**

Access to digital connectivity is facilitated by technological infrastructure such as network towers, electricity and data centres (Faloye & Ajayi, 2021). However, a study by Nyahodza and Higgs (2017) shows that African countries are lagging behind in certain technological innovations,

especially those that require constant electricity and internet support, which are enjoyed in more developed parts of the world. Even within the continent and within its countries, urban parts have more access to these technologies than rural parts because of staggered development. Thus, a digital divide continues to exist.

In light of the realities discussed above, much remains to be done to bridge the digital divide in South Africa. This study hopes to explain the factors that are at play within the context of UKZN, understand the results of such realities as it pertains to the experiences of the students, and proffer solutions that could contribute to bridging the digital divide in the higher education sector in South Africa.

## **2.7 Social Inclusion, Digital Inclusion and Digital Equity as Solutions to the Digital Divide**

Digital inclusion, which is a viable solution to the digital divide, is closely linked to social inclusion. According to the World Bank (2020), social inclusion is the process of improving the terms in which individuals and groups take part in society by improving the ability, opportunity, and dignity of those who are disadvantaged. As already mentioned, social inequality is one of the key contributors to the digital divide. Therefore, promoting social equality by improving the opportunities and means given to all individuals to partake in the digital world, could potentially lead to a reduction in the digital divide.

With the growing prevalence of digital technologies and the increasing importance of digital fluency, it has become even more crucial to tackle the issue of digital equity in education (Schrum et al., 2018). Inequity in digital fluency significantly affects students' educational opportunities while they are at school, and as they prepare for higher education and careers, and this is capable of worsening existing socioeconomic disparities (Martin, 2016). Therefore, digital inclusion and equity are viable paths towards fixing this.

According to the NDIA (2022), digital inclusion refers to certain activities necessary to ensure that all individuals and communities, including the disadvantaged, have access to and use of ICTs. These activities include five elements: 1) affordable, robust broadband internet service; 2) internet-enabled devices that meet the needs of the user; 3) access to digital literacy training; 4)

quality technical support; and 5) applications and online content designed to enable and encourage self-sufficiency, participation and collaboration (NDIA, 2022; Centre for Digital Equity, 2023). Firstly, affordable and robust broadband internet service is crucial to enable individuals and communities to connect to the internet without facing financial barriers. Secondly, access to internet-enabled devices that meet users' needs is essential, ensuring that people have the necessary tools to fully utilize digital technologies. Thirdly, digital literacy training plays a vital role in equipping individuals with the knowledge and skills to navigate digital tools effectively and safely. Fourthly, the provision of quality technical support ensures that users can troubleshoot issues and receive assistance when encountering technical challenges. Lastly, the availability of applications and online content designed to promote self-sufficiency, participation, and collaboration empowers individuals, encouraging their active engagement in the digital realm. By addressing these five elements, digital inclusion aims to bridge the digital divide and provide equal opportunities for individuals and communities to access and benefit from ICTs, enabling them to fully participate in the digital society (Centre for Digital Equity, 2023).

Digital inclusion encompasses not only access to the internet but also the availability of hardware and software; relevant content and services; and training for the digital literacy skills required for the effective use of information and communication technologies (IMLS et al, 2011). According to the National Digital Inclusion Alliance (NDIA), digital inclusion can be fostered by putting intentional strategies and investments in place to reduce and eliminate historical, institutional and structural barriers to access and use technology. These strategies include the provision of support to digital inclusion practitioners and advocates, lobbying for government policies that support access to the above-mentioned elements of digital inclusion, education of policymakers and stakeholders on the importance of digital inclusion, as well as conducting research that can inform public understanding and public policy on issues that advance digital equity (NDIA, 2022).

Digital equity is a foreseeable result of digital inclusion (Centre for Digital Equity, 2023). Digital equity refers to a state where every person and community possesses the necessary information technology skills and resources to actively engage in our society, democracy, and economy. It is an essential requirement for civic and cultural involvement, employment opportunities, continuous learning, and access to critical services, especially as these elements of

society begin to embrace digitalization (NDIA, 2022). For example, people can stand a better chance of being hired by more lucrative jobs and having better access to global opportunities such as visa and scholarship applications, when are digitally literate. Thus, achieving digital equity can ensure that individuals and communities have equal opportunities to benefit from and contribute to the digital landscape, fostering inclusivity and better empowering members of society.

According to del Val (2006), several dimensions of digital equity must be taken into consideration to help bridge the divide. Firstly, he speaks about content creation and the opportunities this provides for learners and educators to create their own content. By doing this, learners can better engage with the intricacies of digital content and become more than just consumers. This can also encourage problem solving and innovation. Secondly, he argues for effective use, explaining that educators need to be skilled in using digital resources effectively for teaching and learning (del Val (2006). Thirdly, del Val (2006) outlines that access to high-quality digital content is needed. High-quality digital content is essential for learning as it engages learners with interactive and immersive experiences, enables access anytime and anywhere, connects learning to the real world, promotes collaboration among learners, and allows for continuous updates to reflect the latest knowledge. It enhances the learning process by offering engaging, accessible, and tailored resources that facilitate active participation and foster deeper understanding in today's digital age (del Val, 2006). Fourthly, content used by students and educators must be culturally relevant. Students in Africa, for example, should be able to access content that relates with the African context. Since one primary goal of learning is to apply what is learnt to daily life and realities, it is important that content can be interpreted and applied within the learning environment (del Val, 2006). Finally, technology resources that can meet the needs of educators and learners, such as good-quality digital devices and internet connectivity, are required. If these five areas of concern are paid attention to by stakeholders (such as the government, policymakers, and school administrators, among others), there will be a significant change in the current realities around the digital divide.

## **2.8 The Digital Divide and Education**

Like in other aspects of modern society, ICT become indispensable to education (Soomro et al., 2020). The digital divide and educational inequalities are important social issues that affect

low-income, first-generation, black learners, especially in developing countries (Buzzetto-Hollywood et al, 2018). In education, the digital divide is often referred to as the ‘homework gap’ because of the difficulty that students in technology-deficient circumstances face when trying to do their homework. Unfortunately, this gap keeps on widening as teachers incorporate technology-based learning into their students’ curricula (Moore et al, 2018). The internet, computer games, mobile phones and other contemporary technologies provide new ways of creating meaning and connecting with the world. If educators wish to use these digital media in schools, they cannot afford to neglect the ‘homework gap’. Rather, they need to provide students with means of accessing and understanding ICTs (Buckingham, 2006).

The internet is used more among students than among the general population in developed countries (Moore et al, 2018). In these countries, the incorporation of the internet into the daily lives of university students is a natural occurrence as they have been exposed to computers from an early age, leading to the integration of the internet into their regular communication practices (Halewood and Kenny, 2008). Students who have the opportunity to attend high schools equipped with sufficient computers and robust digital literacy programmes acquire essential digital skills, giving them a significant edge when transitioning to university compared to their peers who do not have early exposure to such technologies (Digital Divide Council, 2019). However, Nataraj (2014) posits that even though these high school students have an advantage, they sometimes do not develop the technology skills necessary for higher academic and industry success. This must be addressed by universities early in the academic experience, to ensure that students can fully participate in tertiary education and graduate with levels of digital literacy that can help them function well in the workplace.

Higher education institutions face the challenge of admitting students who possess different levels of technological preparedness (Buzzetto-Hollywood et al, 2018). Seeing as most universities accept students from different backgrounds, and with different educational and developmental histories, universities need to ensure that the methods of digital learning they employ are easily accessible and understandable by all students. This is especially true at the undergraduate level of study, as students are typically required to learn at the same pace and within the same structures. Therefore, the overarching goal of many institutions of higher education is that students are able

to use technology in the analysis and communication of ideas and the management, organization, and examination of information.

At the postgraduate level, the significance of computer access, internet connectivity, and proficient skills becomes paramount. This is because students are required to flourish in virtual academic settings (Ng'ambi et al., 2016). Research students are expected to engage in independent online study and possess a comprehensive understanding of diverse programs and software that facilitate data collection and management (Bal et al., 2020). Though many academic institutions provide access to computing facilities for their students, the larger part of the burden of cognitive access still rests on these students, as they are sometimes expected to figure out how to use digital tools and platforms relevant to their academic endeavours by themselves. Also, more students use smartphones rather than computers to carry out their academic activities because this places less of a financial and skill burden on them (Kinash et al, 2012; Roberts & Rees, 2014). However, this is not always ideal as smartphones do not offer the same advanced capabilities as computers.

Moore et al. (2018) recommend that educators should ensure that students can easily find, view and use the required digital and electronic materials through their phones. However, if students only understand how to access digital and electronic materials through their phones, and not through a computer, this might lead to a further gap in cognitive access. This reality poses a problem because the goal of digital literacy in education is not just to ensure that students can succeed within the literal and figurative walls of a school but more importantly, succeed in their professional endeavours after graduating. Mishra et al. (2015) explain that while students are generally proficient in locating information online through search engines, they are less skilled in using more complex software commonly found in business and industry. They found that students were lacking in skills pertaining to technology terminology, the use of spreadsheets and databases, operating systems, core software applications, computer ethics, and cyber security (Mishra et al, 2015). These findings reveal a problematic gap in the pursuit of digital literacy in education. Therefore, educational institutions, especially those concerned with higher learning, must pay more attention to equipping their students with cognitive skills for success in our digitally saturated world.

### ***2.8.1 The Role of Higher Education Institutions in Bridging the Digital Divide***

In the 21st century, ICT has significantly influenced the methods, timing, and locations of students' learning experiences (Oliver, 2002). At the higher education level, ICT plays an increasingly important role in registration, administration, teaching, learning, and research (Nyahodza & Higgs, 2007). Thus, higher education institutions must play a part in ensuring that their students become digitally literate so that they can succeed academically and thrive in the academic environment. One of the most sustainable ways to achieve this aim is through libraries (Singh and Gangopadhyay, 2017).

Being the source for educational resources, libraries must identify user needs and offer the essential infrastructure and technical support necessary for accessing information (Nyahodza & Higgs, 2007). As the internet has become an important source of and vehicle for information retrieval, reference librarians must also be skilled in searching the internet as well as instructing users in how to explore the internet to access relevant electronic information (Darris, 2003).

In recommending ways through which university libraries can help bridge the digital divide, Singh and Gangopadhyay (2017) suggest that libraries should develop infrastructure, establish cyber-literacy study centres, increase information availability by building rich collections of online resources, and help students develop information literacy skills that can serve them in both academic and non-academic contexts. According to Warschauer (2003), giving prominence to the development of digital literacy skills is crucial, as simply increasing access to technology and information without providing adequate education on its effective use would not adequately address the digital divide issue. Many ICT projects focus on providing hardware and software, but neglect the human and social systems that must also evolve for technology to make a difference. To ensure meaningful access to new technologies, universities need to consider multiple factors such as content and language, literacy and education, and community and institutional structures (Warschauer, 2003).

Academics such as lecturers and researchers also have a crucial role to play in bridging the digital divide at universities. According to Marcelo et al (2015), the successful integration of technologies happens when educators prioritize the design of effective learning experiences and the appropriate use of technologies, rather than solely focusing on the technological resources only. For example, lecturers should not merely be focused on what devices students use to access study

materials and processes, but on the way they design such materials for students. The use of pictures, audio, and gamification in online study materials is a great approach to consider. Such practices can appeal better to students and encourage them to participate in the use, and mastery, of digital technology for their academic endeavours.

Universities can also facilitate digital access and literacy through their Information and Communication Services (ICS) offices. These offices are set up to support staff and students as they seek to use digital technology in the academic environment. This is done through day-to-day ICT support, ICT maintenance, training sessions and more. At UKZN for example, the ICS division seeks to “exploit technology to lead academic excellence, research, innovation and societal engagement” (UKZN ICS, 2023). The office provides services such as consultancy, hardware repairs, reinstallation of software, system development and updates, training, database management, hiring of computer lab and audio-visual equipment, and much more for students, academics and professional staff. Hence, the ICS office serves as the first point of call for members of the academic community as they navigate their use of ICTs for various purposes.

## **2.9 The Digital Divide and Online Education during Covid-19 Pandemic**

The novel coronavirus (COVID-19) was discovered in Wuhan, China in November 2019. Soon after, the virus spread and became a global pandemic. Most sectors of the global economy, such as healthcare, finance, and education were impacted. In a bid to decrease the transmission of the virus, social distancing and lockdown laws were enforced as the primary countermeasure against spreading and contracting the virus in many countries. This led to the closing down of several institutions, including schools and universities. About 1.6 billion learners in 190 countries across the world were affected by the pandemic, with 94% of the world’s school population impacted by school closures (United Nations, 2020).

With learning institutions being closed down for months at a time, the education sector in many countries chose to adopt remote learning. This required learners to have access to digital devices and internet connection, and know how to make the best use of them. Hence, the role of digital resources and environments shifted from a luxury to a necessity (Beaunoyer et al., 2020), as students were left with no choice but to rely on digital technology for learning. The problem however, is that due to the digital divide, many students were unable to fully adopt remote learning

systems during this critical time. Consequently, it is unlikely that the COVID-19 pandemic's impact on education will be fully understood or overcome for many years to come (Stewart, 2021).

Lembani et al. (2020) shed some light on the effects of remote learning in their study of the experiences of students at the University of South Africa (UNISA), a distance-learning university. They analysed the access to ICTs among students, and emphasized how students in urban areas had a significantly different educational experience to students with poor ICT access in peri-urban and rural areas. Their study found that home access to ICTs was most common among students in urban areas, while students in non-urban areas had to rely on workplaces and UNISA centres to access ICT facilities. This disparity in access posed a challenge for inclusive online learning. The study concluded that having a “one-size-fits-all” policy on the use of ICTs in facilitating teaching and learning is bound to have limitations in a developing country like South Africa where the realities of the digital divide are so diverse (Lembani et al., 2020). Though this study reflects the daily realities of distance learning students at UNISA, it can be used as a comparison to the realities that students all over South Africa faced during their time away from campuses due to COVID-19. Students who rely fully on LANs and campus WiFi for computer and internet access were unable to access these resources during the pandemic because of the lockdown regulations that prevented non-essential workers and large numbers of people from gathering in physical spaces. These students were at a particular disadvantage and could not be expected to have the same learning experiences and outcomes as their peers who had better access to these resources at home.

In discussing the effects of the switch to remote learning in institutions around the world, Stewart (2021) identified three experiences that were common among educators and students at the institutions studied. These are as follows:

### ***2.9.1 Emergency Remote Teaching (ERT) Shock***

As expected, institutions, educators, and students often experienced a state of shock when transitioning to Emergency Remote Teaching (Rapanta et al., 2020). For many, the closure of schools and subsequent efforts to transition to a life without physical classrooms and co-presence was extremely difficult because they were accustomed to contact learning, and thus unprepared for the demands of remote learning (such as the cost of internet connectivity and the need for more developed digital skills). The COVID-19 pandemic forced institutions and students worldwide to

confront traditional teaching and learning styles and pay more attention to digital/computer technology in education.

### ***2.9.2 Experiences among Students, Educators, Institutions, and Families***

While experiences with ERT have been diverse and complex (Bal et al., 2020), there have been some positive ones. In Saudi Arabia, for example, Abdulrahim and Mabrouk (2020) found that digital learning improved learning outcomes for students, and this was achieved because a robust ICT infrastructure was already in place. Hence, teachers were able to adapt quickly and successfully. Students in the United Kingdom were also well-prepared for remote learning, as they were therefore flexible and able to adapt quickly to the changes made to their classes and curriculum (Choi et al., 2020). Positive experiences were also reported among students and educators in Indonesia and Chile. However, it is important to note that these positive experiences only represent a minor fraction of the global population.

On the negative side, institutions, educators, students, and even family members collectively underwent an accelerated learning experience in distance education. The sudden transition and goal of maintaining educational continuity in many ways exacerbated existing problems in addition to creating new ones. Many teachers and students were unprepared for online learning as a whole. Students reported not knowing the requirements of assignments (Alqurshi, 2020) indicating how certain traditional elements of courses, such as practical sessions, were now lost because they could not be well communicate or delivered via online means. Students also suddenly found themselves spending longer hours on computers and mobile phones as their primary devices for accessing and participating in their courses (Sundarasan et al., 2020). Another negative experience reported was the conversion of homes to workspaces, which led to skewed work-life balance and extended working periods, affecting mental health for many individuals. Also, increased reliance on for-profit organizations such as internet service providers, online communication companies and other media platforms was reported, leading to financial strain to keep up with these companies' services, and even internet addictions.

These diverse experiences called more attention to the fact different people around the world have diverse experiences of life. A prior culture of dependency on digital technology and the provision of the facilities needed for it prepared certain people for ERT during Covid-19. However, those who had a tougher time adjusting to ERT were those who had previously relied

heavily on traditional, in-person learning. Hence, education stakeholders began to pay more attention to the impact of digital technology and needed to become accustomed to teaching and learning environments that facilitated its use.

### **2.9.3 Differing Stakeholder Priorities**

Although universities made significant investments in ensuring educational continuity for students through remote teaching and learning, not all stakeholders necessarily shared the same level of prioritization (Mohammed et al., 2020). Abel's (2020) student interviews in the Philippines highlighted that some students felt as if educational continuity was inconsiderate of their realities under the circumstances, as they and their families were suffering from stress and anxiety, or even illness. They felt that the educational community paid more attention to keeping up with their calendars than understanding the needs of students for a smooth transition and easing up on workloads.

Some of the identified disadvantages of remote teaching and learning included stress (both among staff and students) as a result of teaching online, increased mental health issues, technological obstacles due to issues of access and skill disparities among the students and teachers, immediate changes to course contents, and work overload (Stewart, 2021).

Lai & Widmar (2021) also identified the concern of reduced internet speed during the COVID-19 pandemic. With more people working via the internet, internet speeds took a hit and decreased significantly. Home internet connections with lower bandwidth lost their ability to support households where multiple technological devices were now simultaneously in use (Beunoyer et al., 2020). Hence, working adults and learning children often struggled to get the internet speeds required to perform their tasks effectively. Additionally, staggered internet usage was difficult as online attendance was required at a specific time for many students. This observation points to the need to investigate the quality of internet access students have, instead of simply treating the issue of access as a yes or no question.

According to Du Preez et al. (2020), the execution of online teaching and learning was a cause for concern, as some students were disadvantaged by the sudden and rapid change to a different approach of delivery. In particular, students who were used to contact teaching and learning found it more challenging to adapt to a digital mode of delivery, not because they were not digitally literate, but because they did not have sufficient access to digital platforms. They also

struggled because of an increased need for screen time, a shift from the modes of learning that they were accustomed, the need to spend more money to access good internet connections off campus, and other concerns (Du Preez et al., 2020). Hence, it is important to study the realities of these students, not just from the perspective of access to digital technology, but also from that of their ability to adapt to online learning in light of their daily realities. The findings of such studies could help education stakeholders and regulators make plans that ensure optimal results are gained from online teaching and learning in the future.

## **2.10 Conclusion**

With the significant reduction in the effects and restrictions of the pandemic, the prevailing question is whether it will eventually come to an end and whether the various affected sectors will return to their pre-pandemic state of normalcy. *The New York Times* (2022) reveals that around 71.2% of the world's population has received at least one dose of the Covid-19 vaccine. This means that the rate of infection has been greatly controlled through vaccination. Many establishments, from countries to schools, have now begun to allow controlled physical contact. Most of them began this process by making negative Covid-19 tests or proof of vaccination a prerequisite for access to places, though these requirements are no longer as strict. However, it is inevitable that some pandemic behaviours, that is, systems adopted worldwide due to the existence of the pandemic, may continue. Hybrid working and learning are examples of such behaviours that have demonstrated benefits beyond disease control. They have enhanced the quality of work and life for some individuals, as well as improved productivity and profit margins for certain establishments (Ipsen et al, 2021). Nevertheless, hybrid working and learning do present certain drawbacks for certain individuals. Workers and students have reported disadvantages such as extended hours of activity and screen time, uncertainties in their jobs, inadequate tools for task execution, heightened distractions, and diminished institutional supervision of work or learning habits (Lischer et al, 2021; Ipsen et al, 2021).

UKZN, the site of this research, has also transitioned back to contact learning. At the start of the transition, students were required to provide proof of vaccination, and were issued campus permits as a control measure. In the months and semesters that followed, learners moved away from the practices they had to learn to facilitate their online learning. The question remains as to whether

the University will embrace hybrid learning or make a full transition back to contact learning. Regardless of the answer to this, learners have had quite an experience during the pandemic and have a lot to tell. Hence, this study will do its best to analyse different aspects of these experiences and investigate what ideas, hopes and expectations these learners have for a 'post-Covid' future. I hope that this study will provide an avenue for students to express the complexities of their experiences as they studied online, as well as provide insightful recommendations for better adoption of digital technology at UKZN and the educational community.

## CHAPTER 3: METHODOLOGY

### 3.1 Introduction

This research aims to understand the learning experiences of undergraduate and Honours Humanities students at the University of KwaZulu-Natal (UKZN) during the coronavirus pandemic, in light of the digital divides that exist among them. Hence, this research sought to accomplish the following objectives:

1. To discover the digital divides that existed among the students;
2. To understand the key differences between the experiences of students as they navigated virtual learning;
3. To understand the perceived impact that the digital divide had on virtual learning and the way students approached their academic endeavours during the coronavirus pandemic;
4. To discover how students felt about virtual learning, and what systems they suggest should be put in place by the university and government to make virtual learning more viable in the future.

In light of these objectives, the key research question of this study is “How did the digital divide affect virtual learning and the academic experiences of undergraduate and Honours Humanities students at University of KwaZulu-Natal during the coronavirus pandemic?”

Hence, the following sub-questions were asked and answered:

1. What forms of the digital divide were reported to exist among the students?
2. What were the key differences in the learning experiences of students (if any) at UKZN during the coronavirus pandemic?
3. What was the perceived impact that the digital divide had on virtual learning and the way students approached their academics during the coronavirus pandemic?
4. a) How did students feel about the new learning dynamics at the university?  
b) What systems, as suggested by students, could be put in place by the university and government to make virtual learning more feasible for them in the future?

### **3.2 Type of Research**

This research was located in a qualitative framework because qualitative research studies things in their natural settings, in order to interpret phenomena in light of the meanings people attach to them (Denzin and Lincoln, 2005 quoted in Corte & Aspers, 2019). It involves gathering and evaluating non-numerical data to understand concepts, opinions, or experiences (Bhandari, 2020). Quantitative methods aim to acquire factual knowledge, whereas qualitative methods aim to delve into and gain a profound understanding of facts (Patton, 2002). The qualitative approach was preferred because most of the information needed for this study related to the respondents' personal experiences, which were best explained in textual or oral forms.

The preferred ontological approach for this research is interpretivism. Interpretivist research focuses on comprehending human behaviour by capturing the genuine meanings and interpretations that individuals subjectively assign to phenomena. Its aim is to describe and explain behaviour based on these subjective perspectives (Johnson et al, 2006). Interpretivist research does not simply describes people or events, but also deeply understands them in social contexts (Pham, 2018). Employing another ontological approach, such as positivism, which is based upon the premise that cause-effect patterns exist in the social world as they do in the scientific world (Denscombe, 1998), would not have served this research well. Positivists encourage statistical generalizations that can be applied to entire populations from data gathered, but interpretivists emphasize the existence of socially constructed multiple realities, recognizing that different individuals and groups may perceive and interpret the world differently (Rehman & Alharthi, 2016).

This research aimed to understand the experiences of undergraduate and Honours Humanities students at UKZN only, rather than generalize their experiences to represent the entire UKZN population or that of other universities. The positivist paradigm in social research faces a limitation in measuring phenomena related to intention, attitudes, and thoughts, as these subjective aspects of human experience can cannot be accurately quantified within the positivist framework (Hammersley, 2013), and such phenomena had to be discovered and analysed in order to properly answer the research questions. Hence, the interpretivist approach was adequate, as it allowed for the observation of individual experiences (Pham, 2018). With regard to this study, the interpretivist approach enabled the researcher to understand and explain the respondents' experiences with

digital technology at UKZN based on variables such as proficiency in the use of digital technology, access to digital technology, and the new learning dynamics introduced as a result of the pandemic.

It is also important to note that this research followed a case study methodology. According to Starman (1997: 61), “a case study is a general term for the exploration of an individual, group or phenomenon”. It is a rigorous and systematic investigation that focuses on a particular unit such as an individual, group, or community, where the researcher analyses in-depth data related to multiple variables, aiming to gain comprehensive insights into the subject of study (Woods & Calanzaro, 1980). Case studies enable the researcher to approach a broad topic or phenomenon and narrow it down into specific and manageable research questions, facilitating a detailed exploration of the subject matter (Heale & Twycross, 2018). This research qualifies as an in-depth case study because it takes the broad topic of the digital divide, and narrows it down in the context of virtual learning during the coronavirus pandemic, and looks at the experiences of a specific group of students (undergraduate and Honours students in the Humanities faculty) in a specific university (UKZN).

In this instance, the use of a case study to understand such broad phenomena as the digital divide and virtual learning experiences meant that this research could target certain aspects of how these broad topics affect particular students, and examine the data collected to answer the relevant research questions. Hence, this research did not seek to fully understand the digital divide in its entirety. Rather, it sought to investigate the digital divide along with other relevant variables that come together to understand chosen students’ experiences. Therefore, the results of the investigation are not generalized, but instead seen as the perceived reality of students.

Data in case studies are often, but not exclusively, qualitative. The analysis of the data collected leads to the discovery of themes and assertions about the cases emerge (Stake, 2006). Thus, a case study assists in the development of theories that explain the reasons behind similarities or differences observed among specific instances (George & Bennet, 2005), which is what this research did. The sampling, information gathering, and data analysis techniques used by the researcher to achieve this goal are discussed below.

### **3.3 Sampling Technique**

This study aimed to understand the experiences of a specific category of students – undergraduate and Honours Humanities students at UKZN. Hence, convenience, purposive, and snowball sampling techniques, which are forms of non-probability sampling, were preferred for this study.

Non-probability sampling refers to a sampling technique employed when gathering samples in a manner that does not provide an equal opportunity for all participants or units in the population to be included. In this approach, sample selection is intentional and not based on chance or randomization (Deacon, 1984), as is done in probability/random sampling. Rather, subjective methods are employed to determine which elements of a population are included in the sample (Etikan et.al, 2016). This type of sampling is employed when the research objective is not to generate results that can be generalized to the entire population (Etikan et.al, 2016), and so it aligns perfectly with this research.

As mentioned, the three forms of non-probability sampling which were used are convenience, purposive and snowball sampling. In convenience sampling, members of the target population that meet certain practical criteria, such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate are included in the study (Dörnyei, 2007). Purposive sampling involves the intentional selection of participants based on specific qualities or characteristics they possess. This sampling approach allows the researcher to identify individuals who possess the desired knowledge or experience and are capable and willing to provide the information needed to address the research objectives. The researcher actively decides what information is required and seeks out participants who can contribute to that knowledge based on their expertise or experiences (Bernard, 2002; Etikan et. al, 2016). Lastly, snowball sampling is the identification and recruitment of participants through referrals from other participants (Babbie, 2016). The process begins with identifying a few initial participants who meet the inclusion criteria and asking them to nominate other potential participants who may fit the criteria.

This research strategically combined convenience, purposive and snowball sampling techniques. Humanities students, which are the studied population, were more accessible to the researcher than any other population of students within UKZN, because the researcher herself is a post-graduate Humanities student and is familiar with the faculty. Hence, convenience sampling

was used to select them. Also, students from second year, third year, and Honours were deliberately selected, while first year, Masters and PhD students in the Humanities were excluded. This is because what needed to be known to answer the research questions applied mainly to the former group of students, by virtue of their experiences with studying virtually over the past few years since the pandemic began. Hence, the purposive sampling technique informed this decision. Snowball sampling was beneficial as researcher was unable to meet with large groups of students due to conflicting schedules, and so the participants who were met with were asked to refer their classmates and share the questionnaire link on their class group chats.

Data for this research was acquired from Humanities students in their second and third years of undergraduate study, as well as Honours students. Altogether, the researcher aimed for a total of 30 respondents. This sample size was chosen because of the research's intention to collect and perform an in-depth analysis of qualitative data to properly investigate the topic of interest and address the research questions. When conducting research that necessitates an in-depth analysis of qualitative data, it is advisable to avoid an excessive number of respondents, as a smaller sample size allows for a more comprehensive exploration and understanding of participants' experiences, enhancing the quality of analysis. A large number of participants can result in overwhelming volumes of data, making it challenging to manage and analyse effectively (Smith, 2018; Johnson, 2019). Hence, in order to recognize meaningful patterns and themes within the dataset, the researcher employed a more compact sample size of 30 respondents.

Additionally, Czerniewicz and Brown (2007) note in their study about disciplinary differences in the use of educational technology that students in the hard disciplines of Science, Engineering, and Health Science make more frequent use of ICTs for teaching and learning than those in the soft disciplines of Business and Humanities. Though convenience is the primary reason why Humanities students were chosen for this research, the aforementioned is also a basis upon which they were selected, as their experiences adjusting to higher levels of dependence on digital technology during the pandemic were worth exploring.

The researcher informed students about the study by meeting with some of them on campus, asking students to refer their classmates by sharing the questionnaire link, and putting the participation information on the University Notice System and student groups on Facebook. Some

lecturers and course coordinators of the respondents were also informed to encourage their students to participate in the research.

### **3.4 Research Instrument**

Questionnaires were used as the information gathering tool for this research. A questionnaire is a research tool that comprises a series of questions designed to collect information from respondents about a specific topic. It can be considered as a written form of an interview, where participants provide their responses to the questions in written format rather than through direct conversation with an interviewer (McLeod, 2018). When properly constructed and responsibly administered, questionnaires are vital for the collection of statements about specific groups of people or populations (Roopa and Rani, 2012).

An advantage of using questionnaires for this study is that they provided a standardized interview across all subjects. This meant that all respondents were asked the same questions in exactly the same way. It also eliminated the interference of cues such as the interviewer's behaviour, gender, or tone of voice, which could come up during interviews and influence responses. In addition, the use of questionnaires proved to be a cheaper mode of conducting this research, as they were quite inexpensive to design and administer, as opposed to methods like telephone interviewing which would have been more expensive, as this research was carried out virtually.

The use of focus group interviews was initially considered for this research because focus groups bring small groups of individuals together to engage in interactive discussions facilitated by an interviewer or moderator. The participants are encouraged to speak about their perspectives to the interviewer, and the information gathered is used to derive insights and draw conclusions for research purposes (Deacon, 1984; Morgan, 1996). Questionnaires, however, were preferred over focus groups for this research, because they allowed the respondents to participate remotely at their own convenience, better structure to facilitate data analysis, and reduced response bias because of the anonymity that questionnaires provide.

The questionnaire for this research consisted of both open-ended and closed-ended questions. While the closed-ended questions helped to get measurable information about certain

topics, the open-ended questions allowed the respondents to explain some experiences that were relevant to this study in their own words.

In addition, this study was conducted as a web survey through an online platform (Google Forms) rather than in print format. This was beneficial as the researcher sampled students from different departments in the Humanities and would not have been able to get them all in one place at a time, due to their varying schedules now that classes are back in-person at UKZN. In addition, a web survey eased the process of data processing and analysis as the researcher did not need to manually enter the responses onto a spreadsheet. However, the use of the web questionnaire posed a limitation to this study because the students who were able to fill the questionnaire are clearly those who have some form of access to digital technology and internet connectivity required for it. This limitation was kept in mind as the data gathered was analysed.

The questionnaire used for this research consisted of six sections, tagged A to F. Section A was designed to collect the respondents' background information and demographic data. Sections B consisted of closed and open-ended questions, which sought to gain information about the respondents' digital literacy and access to digital technology, as well as their experiences with some variables that contribute to the digital divide. Section C sought to understand the respondents' experiences with virtual learning in light of their levels of access to digital technology and levels of ability to use digital technology for their academic endeavours. Section D looked at the impact of virtual learning on students' approach to academic endeavours, while Section E sought to understand how students compared virtual learning to contact learning. The last section, Section F, was designed to collect the students' recommendations on how the University and government could help improve virtual learning experiences for students. The questionnaire can be found in Appendix 1.

### **3.5 Method of Data Analysis**

To interpret the data gathered during this study, the answers to closed-ended questions were coded and analysed by measuring percentages, while the answers to open-ended questions underwent a thematic content analysis.

As mentioned earlier, data in case studies are often, but not exclusively, qualitative. According to Creswell and Plano Clark (2011) the use of a combination of quantitative and qualitative methods makes for a greater degree of understanding to be formulated in research than if a single method were applied to specific studies. This research is one of such studies, as there were certain variables that needed to be determined quantitatively to provide adequate contexts and frameworks for the entire body of work. Thus, there was a need to collect some quantitative data in order to fully understand the dynamics that existed among the students, even though this study was mostly qualitative. It was pertinent to use quantitative methods to measure areas such as demographic qualities of students (such as age, gender and year of study), frequency of certain relevant experiences (such as device ownership and internet access), and general opinions, before asking students to provide information in greater detail through qualitative methods. Questions with multiple-choice options were used to this end, and their response rates were determined via percentages, which are calculated by dividing a frequency in the category by the total number of participants and multiplying by 100%. The factors that needed to be quantitatively determined therefore made up the closed ended questions in this research.

The benefit of measuring percentages to analyse the data derived from closed-ended questions is that the method helped to create well-organized data sets, reveal important demographic information, and identify answers that were common among certain groups of students (Albers, 2017). Furthermore, the use of quantitative data helped the researcher to cross-analyse responses between the apparent groups of students. For example, the researcher was able to determine the relationship between percentage of students who had access to phones or laptops and the percentage of students who could perform certain specified tasks on phones or laptops. The results gained from such analyses helped the researcher to identify some commonalities or differences between certain 'kinds' of respondents based on their categorization within subsets, and see how variables reflected in the data affected the results of the entire research. Hence,

employing quantitative data helped lay the essential groundwork and provide context, enabling a clearer understanding of the subsequently gathered qualitative data.

On the other hand, the use of a thematic content analysis was identified as the best method to analyse the answers given to the open-ended questions. This was because these questions were focused on the experiences and opinions of the participants (qualitative data), and so there was an expectation that certain common themes would show up. Thematic content analysis (TCA) is a descriptive presentation of qualitative data. It identifies common themes in texts to express the shared voices among participants (Anderson, 2007). A system of tags (discussed below) was created to categorise textual answers to open-ended questions, and recurring tags were discussed as themes. This helped to identify common experiences shared by the respondents, and differentiate them from experiences that seemed unique to certain individuals. At the beginning of this study, the researcher expected to come across certain themes, but was careful not to focus squarely on them at the expense of more subtle or less common issues that emerged. The themes that emerged from this research include, but were not limited to the following:

- i. Contributors to the digital divide: family background; financial status; personal habits; area of residence; network service providers;
- ii. Differences between students' experiences: ease (or lack) of access to digital technology; the need for improvisation; stress and anxiety;
- iii. Differences in students' reactions to virtual learning: confusion; indifference; adaptability; ease;
- iv. Impact of the digital divide on approach to academics: discipline or indiscipline; better or worse grades; changes in relationships with other students; changes in relationships with lecturers; better or worse study habits.
- v. Recommendations for the university and government: better digital literacy training programmes; facilitation of primary and secondary schools with computers; and infrastructural development, among others.

The findings of this research are discussed in extensive detail in the following chapter.

## **CHAPTER 4: DATA ANALYSIS**

### **4.1 Introduction**

This chapter presents the results related to the learning experiences of Humanities students at the University of KwaZulu-Natal (UKZN) during the coronavirus pandemic. The University community consists of five campuses - Edgewood Campus, Howard College, Medical School, Westville Campus and Pietermaritzburg Campus. These campuses are located in the two biggest metropolitan areas of KwaZulu-Natal: Durban and Pietermaritzburg. However, this research was conducted among students at the Pietermaritzburg Campus, as the campus seats a great percentage of the University's Humanities faculty and offers a mix of students from various backgrounds.

The chapter is divided into five sections. While the first section contains the demographic and background information of respondents, the second section presents answers to the research questions using information gathered from the study. This section outlines results from both quantitative analysis and thematic content analysis carried out on the responses provided by the participants. The third section gives a general discussion of the findings of the research with regard to the literature and theories that were examined earlier while shedding more light on the answers to the research questions.

### **4.2 Getting to Know Respondents**

#### ***4.2.1 Demographic Distribution of Respondents***

This section presents the demographic distribution of respondents, including their gender, age, and year of study.

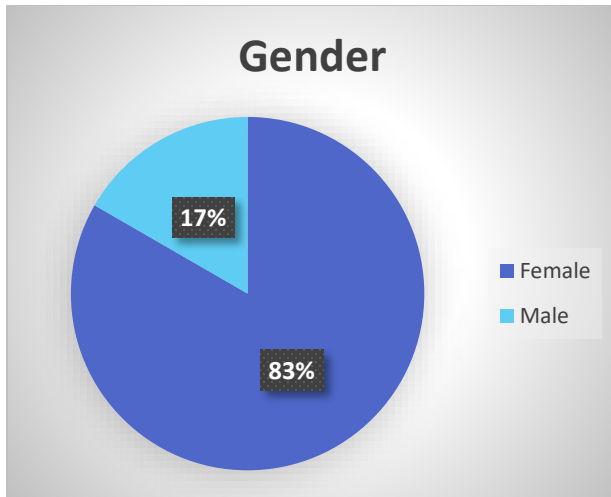


Figure 2 – Gender Distribution

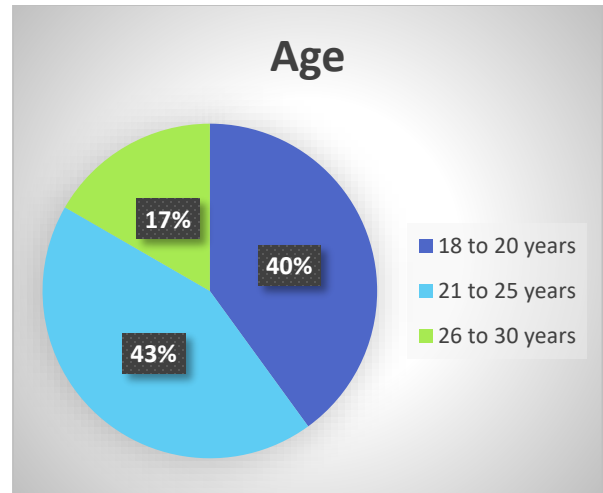


Figure 3 – Age Distribution

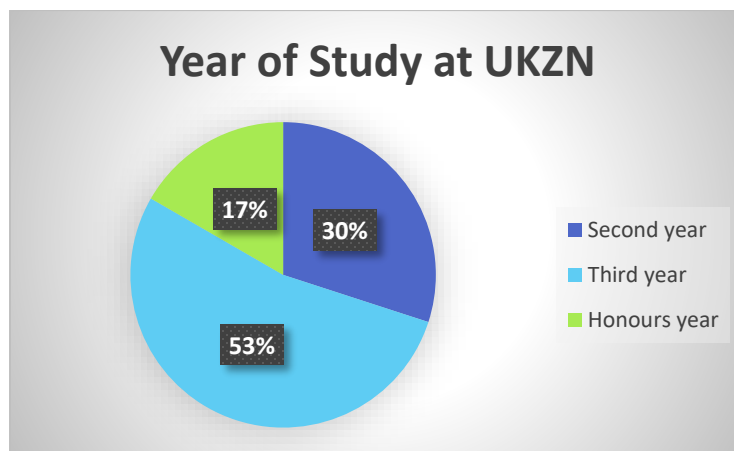


Figure 4 – Year of Study

As seen in Figure 2 above, more than two-thirds of the respondents identified as female. All respondents were between ages 18 and 30, with the majority being between 21 and 25 years old (as per Figure 3). Among the participants, nine were second-year students, 16 were third-year students, and five were Honours students (who had completed their undergraduate degree at UKZN). This means that all respondents have been UKZN students for at least two years, which represents enough time for them to be familiar with the topics investigated in this study.

#### 4.2.2 Students' Access to Digital Technology and the Internet

Phones and laptops are the most popular personal digital devices used by students to connect to the internet and complete their academic work. Nearly all the respondents in this study (97%) said that they have phones that can connect to the internet, leaving only one student without. When asked if they have a laptop that can connect to the internet, 27 students (90%) said Yes, and 3 said No (10%). However, a closer look at the data collected revealed that all students had either a phone or a laptop, and there was no student with none of these devices.

The working state of these devices was also queried. Of the 29 who have phones, 70% said that they did not need to repair their phones in the past year. In addition, of the 27 who have laptops, 60% said that they did not need to repair their laptops in the past year. The few who had repaired their phones or laptops did so only 1 to 3 times in the past year. This means that most of the respondents own digital devices that work relatively well without developing faults.

In terms of internet connectivity, 23 respondents (77%) said that they benefit from the Wi-Fi connection available on campus, while seven respondents (23%) said that they do not. The students were also asked about how much access they had to the internet while at home. Figure 5 below shows their answers.

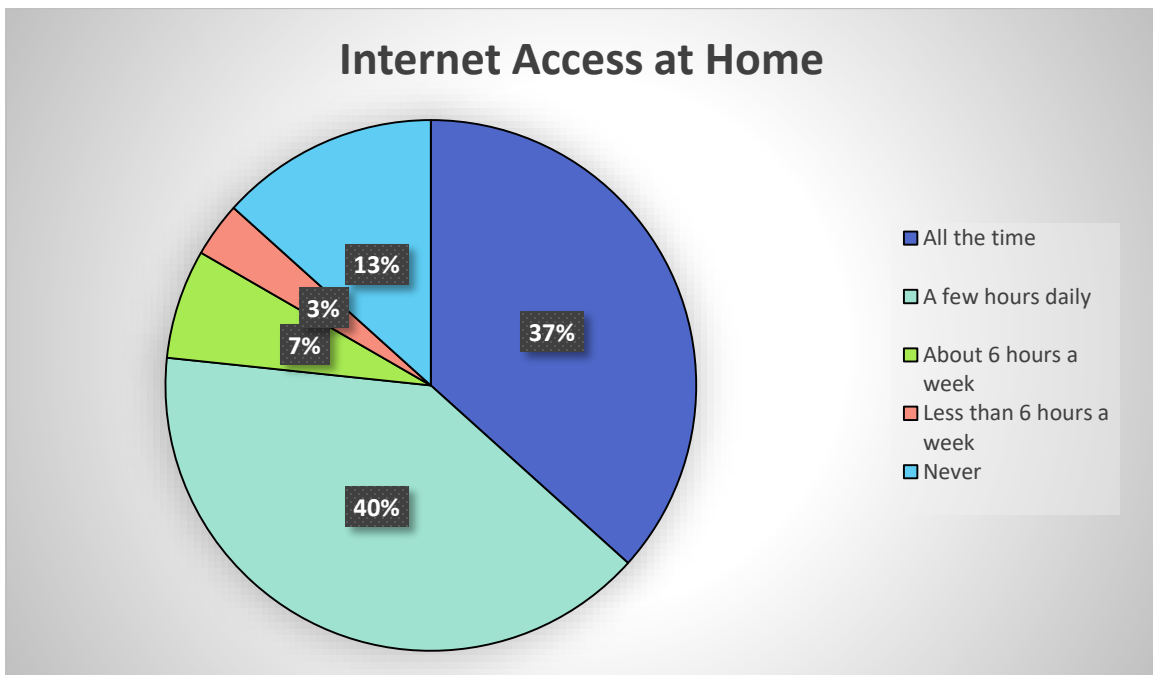


Figure 5 – Home Internet Access

Figure 5 highlights that when they are not on campus, only eleven students (37%) have an internet connection at home all the time. Twelve students (40%) have for a few hours a day, two (7%) have for about 6 hours a week, and one (3%) has internet access less than 6 hours a week. Four students (13%) said that they never have an internet connection at home. This shows that about 77% of the respondents have generally reliable access to the internet at home, while up to 13% do not.

#### 4.2.3 *Students' Levels of Digital Literacy*

To measure respondents' levels of basic digital literacy, they were asked whether they could perform certain tasks on their phones and computers. These tasks included typing documents, sending emails, conducting internet searches and using other software that were relevant to their academic work. Figure 6 below shows the number of students who can perform these tasks on phones and computers.

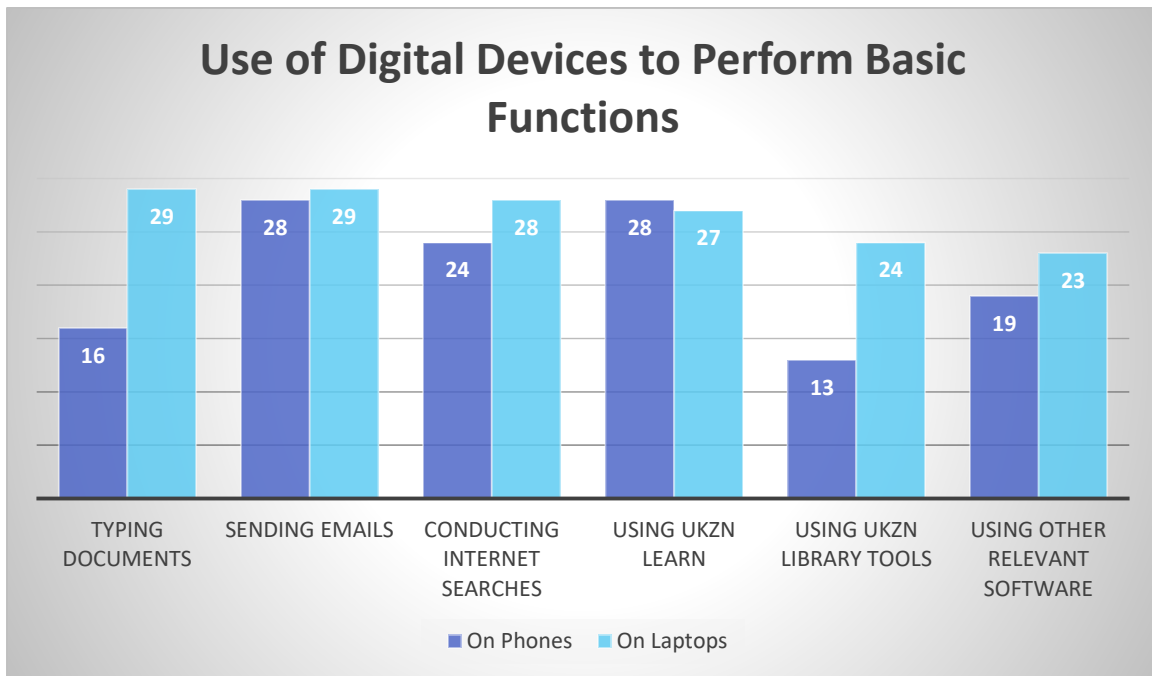


Figure 6 – Device Use for Basic Digital Tasks

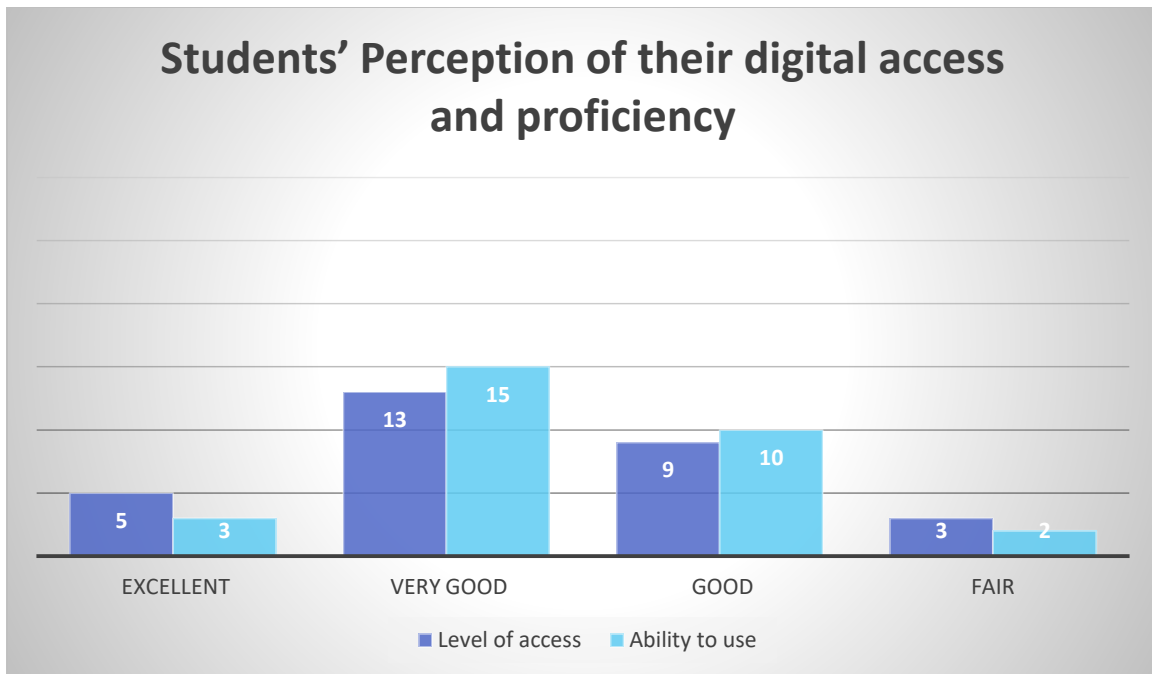
From these statistics, it can be deduced that most students knew how to perform the presented tasks. However, more students seem to be more proficient in using laptops than their phones for the highlighted tasks. This could be a result of preference and practice, as students tend to learn how to do formal tasks on their laptops, and phones are usually reserved for more personal

functions (Chan et al., 2015). Also, it is important to note that of the three students who do not own laptops, two are able to perform all the highlighted tasks while one cannot perform any. Hence, the two students appear to have learnt to perform these tasks using resources that belong to UKZN or other individuals, while the one student has not learnt at all.

Students were also asked how they learnt to use these features on their phones and laptops. It was found that eleven students had not received any training and therefore taught themselves how to perform the tasks they could. The one student who cannot perform any of the tasks highlighted in the previous paragraph also said that they had not received any formal learning for any task. Among the tasks for which students received formal learning, the highest rankings were assigned to the use of UKZN Learn (Moodle) and UKZN Library tools, with 37% and 50% of students, respectively. However, more students, consisting of both those who have and have not received formal learning, are able to use the platform on their laptops (80%) than on their phones (43%). This could be as a result of UKZN's focus on teaching the use of this platform on computers.

#### ***4.2.4 Students' Perception of Their Access and Ability to Use ICTs for academic purposes***

As part of the survey, the students were asked to assess their level of access to digital technology and their perceived proficiency in using it for academic purposes. Figure 7 below shows how students responded.



*Figure 7 – Access and Perceived Proficiency*

Figure 7 shows that only five students (15%) perceived their access to digital technology for academic purposes as excellent, while the majority (73%) believed that they have good or very good access. Three students believe that they only have fair access. Similarly, 25 students (75%) rated their ability to use digital technology for academic purposes as good or very good. Only about 10% of the students think that their levels of access and ability are just fair, and no student perceived their access and ability as poor. Judging from these perceptions, it can be deduced that there is a high degree of general access to digital technology and the ability to use it among the students. However, the answers to the previous questions which look deeper into their realities in terms of the types of technology they have access to and the functions they can perform with these technologies reflect a different circumstance. Thus, there is a gap between the students' perceptions and their reality. While a vast majority of the students have great perceptions of their access and ability, they do not all have access to the same types of technology, and do not share the same abilities as pertain to each of these devices. Thus, it is confirmed that in terms of both reality and perception, there is a digital divide among the students.

### **4.3 The Digital Divide and Covid-19**

This section presents the findings from the students' responses to the questionnaire about the impact of online during Covid-19 and the various factors that impacted students' ability to engage within this virtual space.

#### ***4.3.1 Digital Divides Among Students***

This research sought to explore the factors contributing to the digital divide among students by asking about predetermined factors such as family background, financial status, secondary schools attended and personal preferences, and then provide students with the opportunity to discuss additional factors influencing their use of digital technology. This section will focus on recurring themes derived from the students' responses, shedding light on the key factors that contributed to the digital divides among them.

##### *4.3.1.1 Family background*

The responses revealed that family background does affect a student's use of digital technology both positively and negatively. While 60% of the students said that their use of digital technology was affected positively by family backgrounds, 20% were affected negatively, and 20% were indifferent.

For students who indicated a positive impact from their family backgrounds, their reasons included receiving support and encouragement and growing up in an environment where computers were readily accessible at home. One student said, "We grew up with desktops of our own, so we learnt how at a very young age." Another said, "Family has encouraged me to adapt to the changing world by using digital technology." The result of having a positively impactful family background reported by the respondents is that it got them exposed to digital technology early on in life, thereby preventing the need for them to only learn how to use it upon starting university. Thus, these students reported proficiency in their use of digital devices to perform different functions.

The students who indicated a negative impact from their family backgrounds listed reasons such as a lack of technology at home, living in rural areas, and financial strain as their explanations for having a bad experience. A student revealed, "I live in a deeply rural area where there is no electricity. We still depend on solar systems where we charge our phones & laptops; however, it is difficult to fulfil this purpose when the weather is rainy or cloudy. This has made it very tough

for me during online learning.” Another interesting finding pertaining to the negative influence of family backgrounds was the beliefs held by families. A student said, “My family's background has made it hard because at first, they didn't believe that a phone comes with good use, but instead outlined all the negativity of having a cell phone. That on its own, I feel, has deprived me of opportunities to know and experience a lot more with digital technology.” The effects of having negatively impactful family backgrounds reported by the respondents include a lack of supporting infrastructure, mental support, and financial support at home, which prevents that from using digital technology.

Family background proves to be an overarching factor that most of the other factors listed below fall within. Because these students are young and have not lived very independently of their families, their family background has effects on where they live, the financial resources available to them, the primary and secondary schools they got to attend, and so on. Thus, it can be concluded that the students' family background is the foundational determinant of their digital realities in the context of this research.

#### *4.3.1.2 Financial status*

This research discovered that financial status has both positive and negative effects on students' use of digital technology. While 47% of the students said that their use of digital technology was affected positively by their financial status, 30% were affected negatively, and 23% were indifferent. It is important to note that judging from the responses, most students rely on their families for financial aid and therefore identify their family's financial status as the same as their personal financial status. Thus, family background and financial status are two closely linked digital divide factors in the context of this research.

The students who indicated that their financial status had a positive influence gave examples of privileges they could afford, such as attending primary and secondary schools that taught digital literacy, having good phones and laptops purchased for them by family, and the ability to afford maintenance costs for digital technology.

Conversely, those who indicated that their financial status had a negative influence complained about the cost of loading data, stating that it has put a dent in their finances. One student also highlighted the issue of being unable to afford good quality gadgets, saying, “There

are gadgets that I wish to buy, but I cannot buy those things because I do not have any money. So, I am missing out on some gadgets that have been innovated (*sic*)”.

#### 4.3.1.3 *Secondary schools attended*

The survey findings also indicated that the secondary schools students attended had an impact on their utilization of digital technology, with both positive and negative effects observed. Among the respondents, 60% reported that their secondary schools had a positive influence on their use of digital technology. Conversely, 17% felt that their schools had a negative impact, while 23% expressed indifference towards the influence of their schools on their digital technology usage.

The key features of secondary schools that were reported to have a positive influence on students’ utilization of digital technology include the availability of abundant digital resources, such as computer rooms and internet connectivity, as well as instruction on computer hardware and software usage, particularly during grades 8 and 9.

However, being located in rural areas, not having computer facilities or teaching about digital literacy, and even frowning upon the usage of cell phones by students characterized those schools that had a negative impact. As a result, students from these schools reported that they struggled with learning and understanding how to use digital technology at university because it was at a later and more demanding stage in their education journey.

A closer look at the data collected revealed a commonality among the students’ responses – those students who reported a negative influence by their secondary schools also said the same for their family backgrounds and financial status. This further reveals the close link between these factors. However, these same students all reported a positive link between their personal choices and their newfound fondness for digital technology. This implies that though their foundational factors did not support their digital literacy, their personal preferences and choices, or motivational access, has proven to be a ‘saving grace’. The effects of students’ personal choices on their digital realities are discussed next.

#### 4.3.1.4 *Personal Preferences and Choices*

The survey also unveiled that students' personal preferences and choices play a significant role in shaping their use of digital technology, with both positive and neutral effects observed.

Among the participants, a substantial 90% stated that their personal preferences and choices positively impacted their use of digital technology, while 10% expressed indifference towards this influence. This shows that despite the difficulties faced by students due to family backgrounds, low income and other issues, they are still motivated to use digital technology as they are aware of its benefits. Among the former group of students who reported that their personal preferences and choices positively impacted their use of digital technology, more than 80% reported their perceived ability to use digital technology as Excellent or Very Good, while the latter group who expressed indifference in this regard perceive their ability to use digital technology as either Good or Fair. This reflects a strong correlation between the students' personal choices to use digital technology and their perceived ability to use it. Those who are more motivated to use it are clearly more confident in their ability, unlike their indifferent counterparts. Notably, no student reported that their personal preferences and choices had an utterly negative impact on their use of digital technology.

When asked why they made choices that led to increased use of digital technology, the students provided a range of reasons. Among these reasons, socialization and information-seeking preferences emerged as the most prominent. Some students expressed that they appreciated how digital technology enabled them to socialize without the need for physical interactions, which they preferred due to their introverted nature or experience of social anxiety. They also said that access to websites that made their academic work easier (such as LitCharts for English poetry, Microsoft Suite for typing and editing assignments, and YouTube for visual learning) was important. One student said, "I enjoy watching YouTube videos to study since visuals make it easier to understand almost everything." Another student mentioned that the vast nature of social networks like TikTok made them useful for not just entertainment but also for learning.

The answer given by one student, who said, "My life would probably be at a standstill if I didn't have any access to digital technology", sums up the experiences of most of the students. They enjoy using digital technology for various reasons, mostly tied to hobbies, the gratification of the desire for entertainment and the ease of completing both academic tasks through supporting software. Thus, personal preferences and choices do not appear to contribute to the digital divide among this group but instead appear to encourage their engagement with digital devices. However, this does not necessarily speak to their levels of digital literacy, which is a very broad phenomenon

as discussed in Chapter 2. These students have mostly listed access to entertainment and software that make academic tasks easier as the inspiration for their choice to use digital technology, but these two factors do not contribute greatly to digital literacy. For example, the students have mentioned that they use YouTube and TikTok to learn, but there is no evidence that they know how to carry out a proper information search, discern between credible and false content, and think critically as they interpret the information they find on these incredibly volatile platforms. Thus, the personal preferences and choices of these students reflect positive motivational access to digital technology but do not speak to skills access.

#### *4.3.1.5 Living in rural areas*

A significant theme that emerged from responses provided by the participants was the issue of residing in rural areas. This factor became evident when examining the students' accounts of their neighbourhoods, internet access at home, secondary schools and financial status. It was discovered that those students who had 6 hours or less of internet access when they were at home lived in townships and small towns (such as uMlazi, uMzinyathi, Ophokweni and Eshowe). Also, some of the students who reported that their secondary schools had a negative influence on their use of digital technology mentioned that the schools were in rural areas.

Ultimately, there is a strong correlation between the factors listed in this section, and this is reflected in the link between family background, financial status, secondary schools attended and living in rural areas. This proves that living in rural areas is not an isolated factor in itself, but is both a cause for and effect of other factors discussed.

#### *4.3.1.6 Network service providers*

Another interesting discovery was that the network service providers affect students' use of digital technology. Although some students possess the necessary devices, they often encounter difficulties in accessing internet connections from certain network service providers, both on campus and at home. Moreover, due to the cost of data, some students are compelled to settle for cheaper network service providers, which may result in subpar internet connectivity. This reality contributes to the digital divide by placing this particular group of students at a disadvantage compared to their peers who subscribe to more reliable network service providers. In South Africa, the prominent network service providers include Vodacom and MTN, while Cell C, Rain and Telkom are some of the less steady ones. Though the students did not share what specific network

service providers they use, a look at the 4G coverage of these networks across parts of KZN where the students live reveals that certain network service providers do not offer great connection in the less developed areas as compared to cities areas, and this affects their users.

#### *4.3.1.7 Loadshedding in South Africa*

Some students also revealed that the current loadshedding crisis in South Africa is negatively affecting their use of digital technology. Loadshedding is an ongoing electricity crisis in South Africa, where the supply of electricity is rotated between different parts of communities due to insufficient power generation assets, thereby resulting in inconsistent access to electricity. Loadshedding limits some students' access to digital technology because they lose internet connection when the power is out. Though some students have battery-powered cell phones and routers, the service towers that supply internet connectivity sometimes shut down during loadshedding because they do not run optimally without electricity and sometimes do not have backup systems in place. However, this experience with loadshedding translates differently for the students based on their areas of residence and financial status. Some students live in neighbourhoods that have loadshedding worse than others due to higher electricity consumption or poor power infrastructure, which means that they suffer the consequences more adversely. Also, some students live in homes where they can afford alternative power sources like inverters and generators during loadshedding. If such students are subscribed to network providers whose towers stay functional during loadshedding, such as MTN, then they may not always suffer interruptions in internet access due to loadshedding, unlike their peers who do not have alternative power sources.

#### **4.3.2 *Students' Experiences of Virtual Learning during the Coronavirus Pandemic***

As already outlined, this research aimed to explore the experiences of students during the coronavirus pandemic, especially those that impacted virtual learning. These experiences were examined from two perspectives: those driven by the students' levels of access to digital technology and those driven by their ability to use digital technology. Below are the key findings from the study.

##### *4.3.2.1 Experiences of Access to Digital Technology for Virtual Learning*

Five key areas were explored while investigating students' experiences of access to digital technology during the coronavirus pandemic. These areas included: 1) ease of access to the

appropriate devices and internet connection; 2) happiness with the access to digital devices and internet connectivity; 3) inspiration or determination to improvise or make do with available devices and internet connection; 4) the desire to socialize with other students about challenges of access for academic work; and 5) levels of stress, anxiety or frustration due to inadequate digital devices and internet connectivity.

In terms of access to devices and internet connection, three students said that they always found it easy to access technology, while ten said they often did. Less than half of the students (43%) said that they did not have easy access to devices and the internet. Within this group, three students (10%) said that they had never experienced easy access. However, when asked if they experienced happiness with their access to devices and internet connection, only three students (10%) reported that they had extremely positive experiences, while seven (23%) reported negative experiences. This highlights that even though students have easy access to technology, they feel that the experience is only moderately positive. A look at other information given by the students reveals that this dissatisfaction could be due to a desire for better devices than they have, a need for more affordable connectivity costs, and the discomfort brought about by circumstances which are beyond the students' control, such as loadshedding. Thus, while access is generally easy for the students to attain, satisfaction with the levels and forms of access is mostly moderate among them.

Furthermore, 22 students (73%) reported that their level of access to digital technology for virtual learning occasionally or always resulted in them having to improvise or make do with the available devices and internet connection they had. Again, this is due to a desire for better devices and better quality of internet connection, as this group of 22 students includes those who have only one device that can connect to the internet, those who have had to repair their devices one to three times in the previous year, and those who only have a few hours of daily internet connection when at home. However, this need for improvisation is not based on the students' perceived ability to use digital technology, as they all reported their ability as excellent, very good, and a few, good. Only eight students (27%) reported satisfaction with their devices and internet connection and hardly had to improvise. Interestingly, despite these difficulties, only 60% of the students felt the need to discuss their challenges regarding access to digital technology with other students. Though the students did not provide a reason for this, their recommendations for the improvement of virtual

learning, which will be discussed later on in this chapter, reveal that they expect help regarding access to digital technology from the university management and the government, and not from their peers. This is a possible explanation for them not being very keen on discussing their access-related challenges with their peers.

When asked if they experienced stress, anxiety or frustration due to the inadequacy of their digital devices and internet connection, eighteen students (60%) reported that they had experienced this – some more frequently than others – while twelve said that they rarely or never experienced this. Among the former group of students, 50% struggled with the devices available to them having repaired such devices one to three times in the previous year. Also, only 4 students, making up 22% of this group, said that they had internet access at home all the time, while the others only had access a few hours daily or weekly. However, contrary to this experience, all students within this group perceived their levels of access to digital technology positively. This, again, reveals a gap between the students' perception of their experiences and their actual reality, as earlier discussed. The latter group of students who rarely or never experienced stress, anxiety or frustration due to the inadequacy of their digital devices and internet connection consists mainly of students who revealed that their family background and financial status had a positive influence on their use of digital technology and therefore can afford ideal devices and internet connection. Altogether, more students reported negative experiences pertaining to lack of ease, dissatisfaction or stress in the five key areas investigated in the context of their access to digital technology for virtual learning.

#### *4.3.2.2 Experiences of Ability to Use Digital Technology for Virtual Learning*

In a bid to discover students' experiences of their ability to use digital technology, a similar five key areas to above were examined. These were: 1) ability to use digital technology needed for academic tasks; 2) happiness with their academic results based on their ability to use digital technology for academic tasks; 3) ability to improvise and make better use of digital technology for academic purposes; 4) ability to socialize with other students about their challenges with digital technology for academic work; and 5) ability to deal with the stress, anxiety or frustration of their digital skills to achieve desired results.

In terms of ability to use the digital technology needed for academic tasks, only 6 students (20%) reported a negative experience, while 24 students (80%) reported positive experiences to

varying degrees. Similarly, when asked if they experienced happiness with the academic results they achieved with their level of ability to use digital technology, 23 students (77%) reported different extents of positive experiences.

As per the students' reports, their ability to use digital technology for virtual learning led to varying degrees of determination to learn how to make better use of it. Specifically, 33% of students expressed frequent determination, another 33% reported occasional determination, while a further 33% mentioned infrequent determination to improve their ability to use digital technology for academic purposes. In other words, over half of the students, to varying degrees, felt the need to improve their ability to use digital technology for academic purposes while learning virtually. Interestingly, every student in this category had earlier reported that they could perform all the basic functions they had been questioned about (typing documents, sending emails, conducting internet searches, using UKZN Learn (Moodle), using UKZN Library Tools, and using other software relevant to their academics) on a computer, while 70% of them said they could perform all the tasks on their phones. This means that the students may not necessarily have been inspired to learn new skills, but instead to build upon those skills that they already had, and in some cases, to learn how to perform some tasks on their phones and not just computers. Notably, half of the 33% of students who mentioned infrequent determination to improve their ability to use digital technology had earlier said that they did not feel a need to improvise with the devices and internet connection available to them. This group of students rate both their levels of access and ability highly, with only 2 of them rating these two aspects as fair.

When asked about their experiences with stress, anxiety or frustration with their digital skills to achieve desired results, five students revealed that they always felt stressed. Four out of these five students revealed very low satisfaction with the results they derived from using digital technology based on their skill level, while one said they were often satisfied. These same four students had said they always felt stressed when asked about their feelings within the context of access, while the same one student had said they never felt stressed in terms of access. This raised a need to take a closer look at the student who was an 'outlier' in this group. What stood out about this one student is that even though they had both a phone and a laptop, they revealed that their secondary school never had any technological devices for them to learn with and that they had never received any formal training for any of the tasks they could perform on phones and

computers. Hence, though they have relatively good access to digital technology, this student is self-taught and does not seem to be satisfied with their skill level, leading to feelings of stress and an inability to achieve their desired results. This student's situation points to the skills gap between early and late adopters of digital technology.

Additionally, half the students (50%) reported that they hardly or never felt the need to discuss any challenges they faced due to their skills or ability to use digital technology for academic work with other students, while only 9 students (30%) stated that they often or always felt the need. This result was quite unexpected, as it was initially assumed that more students would be keen on discussing skills-related challenges than access-related challenges. However, twice as many students discussed the latter rather than the former with their peers. Unfortunately, further questions were not asked that could have helped to comprehend their reason for this, thereby proving a limitation to the better understanding of this dynamic.

Altogether, it appears that more students are confident in their ability to use digital technology for virtual learning and reported fewer negative experiences based on this variable than they did on the topic of access to digital technology. The apparent reasons for their greater confidence in skills than access can be summed up as this – while skills can be learned and improved upon at this stage of the students' lives, a lot of the variables that affect access (such as financial status and power supply) are beyond the students' control, and they, therefore, are sometimes forced to live as victims of such variables.

#### ***4.3.3 The Impact of Virtual Learning on Students' Approach to Academics***

This research went further to investigate the impact that virtual learning had on students' approach to academic endeavours, with a focus on the actions taken towards completing coursework, fostering academic relationships, conducting research and critical thinking, and studying in general. The results of this line of questioning are summarised below.

Two-thirds of the students revealed that virtual learning has caused them to struggle to different degrees with understanding their coursework and completing their assignments. Due to these struggles, most of the students (67%) became more open to having academic conversations with their classmates during virtual learning. Virtual learning also caused the students to become more

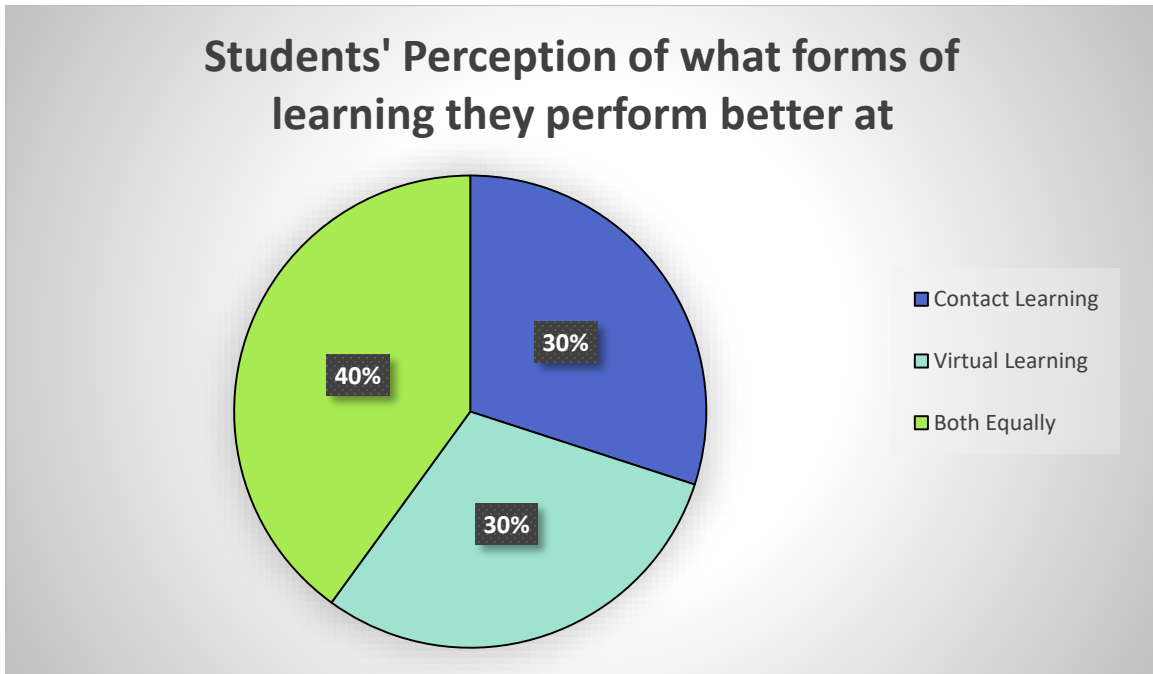
invested in their academic efforts, with 80% of them reporting that they became more open to researching sources outside of what their lecturers taught. Similarly, more than half of the students confirmed that virtual learning caused them to think more critically when completing academic tasks and led them to study more than they usually would during contact learning. Put together, these results reveal that while students deemed virtual learning to be more demanding than contact learning, as they felt challenged by the requirements of virtual learning. However, the students displayed resilience as only 5 of them (17%) contemplated giving up on tertiary education due to the complexities of virtual learning. Instead of throwing in the towel, a vast majority of the students recognised a need to put new systems and habits in place to help them function better within virtual learning and achieve their desired results. This led them to improve their relational, research and critical thinking skills.

However, one area where virtual learning had a very low impact, was on the students' effective communication with their lecturers. While 50% of the students neither agreed nor disagreed to having improved communication with their lecturers during virtual learning, only eight students said that virtual learning caused them to communicate better with lecturers. A few of the students expressed that they found it much easier to relate with their lecturers within physical contexts. From these results, it can be deduced that virtual learning caused students to be more reliant on one another as well as on their own selves, but not necessarily on their lecturers.

While this section has looked at how virtual learning caused behavioural adjustments in the students, the next section presents a more detailed discussion of their feelings about virtual learning in comparison with contact learning.

#### ***4.3.4 Students' Perception of Contact and Virtual Learning***

This research also explored students' preferred modes of learning, as well as their perceptions regarding the benefits and drawbacks of virtual learning and contact learning. Figure 8 below illustrates that among the students surveyed, an equal number (nine students each) expressed a preference for both contact and virtual learning methods. However, it is worth noting that 40% of the students believed they would perform equally well in both virtual and contact learning environments.



*Figure 8 – Preferred Types of Learning*

Furthermore, when asked what teaching and learning methods they would prefer the university to continue with post-pandemic, most of the students (53%) voted for mixed methods (a combination of contact and virtual learning), while 20% and 27% of the students voted for contact learning and virtual learning respectively. Therefore, contact learning emerged as the students' least preferred learning method.

When asked to share reasons for their preference, the most common answer among those who chose mixed methods was that mixed learning methods would allow for the students to be on campus for functions that necessitated physical attendance, such as certain lectures, practical sessions and group assignments, while other tasks that could be completed virtually, like some lectures and academic writing, could be done as such. This could lead to better flexibility and balance for them.

Those who said that they would prefer to continue with virtual learning stated reasons such as flexibility, convenience, better grades, and lack of interest in adjusting to contact learning after having used virtual learning for the past few years. According to these students, the opportunity to work at their own pace and consult different information sources during virtual learning led to better grades. However, these students believe that contact learning will constrain them by

enforcing stricter times for certain tasks to be completed, or require higher levels of socialization which they are not ready to explore.

Among those who said that they prefer contact learning, reasons such as a better understanding of the coursework, better relationships and interactions with peers and lecturers, and a more wholesome varsity experience emerged. These students believe that being physically present on campus is an integral part of the varsity experience that should not be done away with, and therefore revealed that during virtual learning, they felt like they were being deprived of this ideal experience they had looked forward to since their secondary school years.

A noteworthy recommendation made by one of the students is that “Those who started university with virtual learning should continue with that method because they have gotten used to what was introduced to them in the first place.” Even though this student had earlier expressed that they think they will thrive equally well in both virtual and contact learning, the student seems averse to the sharp changes that may come with a switch from virtual to digital learning, and would rather be spared the need to make any adjustments to what they have already become accustomed to.

The students were also asked about what form of learning they believed would deliver better results in specific areas. Their answers are presented in Figure 9 below.

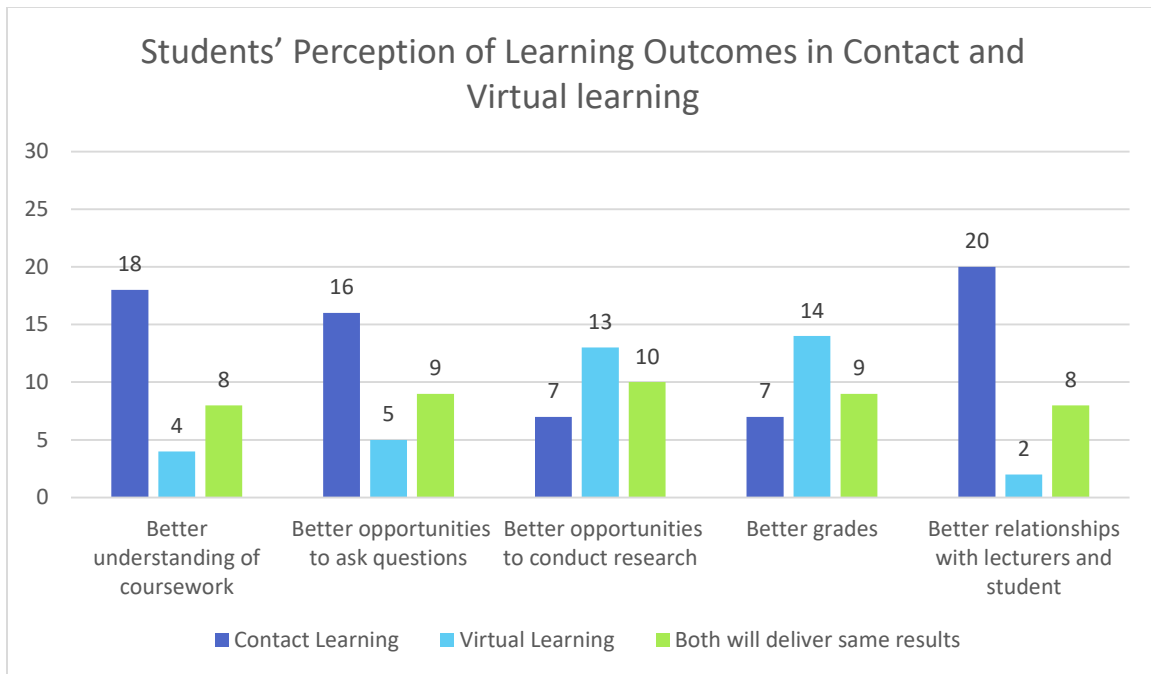


Figure 9 – Perceived Learning Outcomes

Figure 9 shows that among the students, contact learning is believed to deliver better results in understanding coursework, better opportunities to ask questions and better relationships between students and their lecturers and peers. These three areas are closely related to communication and therefore reflect that a majority of the students prefer in-person communication in the academic context. For example, less than 10% of the students believe that virtual learning can help them build better relationships between themselves and their lecturers and peers. This is no surprise as students had expressed at various points that they sometimes struggle to communicate effectively with lecturers in a virtual setting. Additionally, these three aspects in which the students expressed a preference for contact learning are closely related, as, better opportunities to ask questions and better relationships between students and their lecturers can lead to an improved understanding of coursework.

On the other hand, virtual learning is believed to offer better opportunities for conducting research and getting better grades. This is so because, as earlier expressed by most of the students, virtual learning has caused them to think more critically and conduct a wider range of sources when conducting academic tasks. For some of these students, the result of better research is better grades.

Hence, we can conclude that according to these students, contact learning offers better opportunities for human relationships to grow within the academic context, and this has a positive effect on how discussions are understood. However, virtual learning encourages more critical engagement with academic topics, as the students conduct wider research to understand such topics, leading to wider knowledge and in some cases, better grades. The section below, which discusses the students' perceived advantages and disadvantages of contact learning and virtual learning, sheds some light on the motives behind the preferences expressed by the students in this section.

#### ***4.3.5 Perceived Advantages and Disadvantages of Contact Learning and Virtual Learning***

This section explores the insights provided by students regarding the advantages and disadvantages of contact learning and virtual learning based on their experiences with both learning methods over the past few years. Their responses are discussed based on recurring themes. It is important to note that some themes arose as advantages or disadvantages of both virtual and contact learning, because of the differing opinions of the students. However, the justifications given for these themes in either learning context are different, based on the students' individual experiences. For example, while some students believe that contact learning offers better opportunities for discussion and socialization, others believe that virtual learning is better because online interactions reduce social anxiety and therefore help them express themselves more boldly.

##### *4.3.5.1 Advantages of contact learning*

According to the students, contact learning facilitates a better understanding of coursework. In a physical classroom setting, they have access to immediate assistance, clarification, engagement, and problem-solving with their lecturers and peers. This direct interaction allows for real-time discussions and active participation, enabling them to grasp complex topics more effectively. Furthermore, the non-verbal cues and visual aids used in contact learning can enhance their understanding of coursework.

The students also emphasized that socialization and the ability to build better relationships with both lecturers and peers was a benefit of contact learning. They expressed that physical attendance creates an environment that encourages social interaction and collaboration among students, especially through group projects and extracurricular activities.

The students also disclosed a financial benefit of contact learning, that is, freedom from data costs. Unlike virtual learning, which often requires stable internet connectivity and data access, contact learning eliminates the concern of data costs for students. This freedom from the financial constraints placed on them by data requirements (and other conduit costs) ensures easier and more equal access to education for students.

Lastly, the students revealed that contact learning offers them the opportunity to navigate ‘the real world’ outside the virtual realm. Physical attendance provides a tangible and immersive learning experience, allowing students to engage with their surroundings, explore, and apply theoretical knowledge in practical scenarios.

Ultimately, it is clear that some students’ perception of contact learning is that it makes for a more immersive tertiary experience, as better access to people would help them learn more effectively and build more meaningful relationships. Nonetheless, some disadvantages associated with virtual learning were expressed.

#### 4.3.5.2 *Disadvantages of contact learning*

One of the disadvantages of contact learning mentioned by the students is the perception of tests being more difficult compared to virtual learning. In a physical classroom, assessments often involve traditional exams or in-person presentations. Some students feel that these evaluation methods place additional pressure on them, as they need to demonstrate their knowledge and skills in a limited timeframe and within a formal setting.

Additionally, students highlighted social anxiety as a disadvantage of contact learning. Some students said that they experience social pressure and fear of judgment from their peers in physical classrooms. This social anxiety sometimes hinders active participation in class discussions, asking questions, or engaging in collaborative activities.

Another disadvantage of contact learning mentioned by students is the inconvenience associated with physically attending classes. Some students revealed that they faced challenges related to the cost and distance involved in commuting to campus. This caused them to have problems with punctuality and overall attendance. A similar inconvenience which the students associate with contact learning is longer lecture hours. Some students stated that their online classes were typically shorter than in-person classes. Students find it challenging to concentrate

and maintain engagement during lengthy lecture periods due to low attention spans and fatigue. This sometimes discourages them from attending lectures altogether, resulting in diminished learning outcomes.

Lastly, the absence of recorded classes emerged as a disadvantage of contact learning as reported by students. With virtual learning, recorded lectures provide the flexibility for students to review course materials at their own pace and convenience. However, in contact learning, the absence of recorded classes can limit students' ability to revisit lectures or catch up on content missed due to unforeseen circumstances.

#### 4.3.5.3 *Advantages of virtual learning*

The advantages of virtual learning presented by the students reveal that they consider virtual learning to be a solution to the disadvantages and inconveniences found in contact learning. Also, they stated factors that pertain to their lifestyles and habits as advantages of virtual learning, suggesting that virtual learning offers better personal growth and mental well-being than contact learning.

Firstly, the students revealed that virtual learning offers them the advantage of improving their computer literacy skills. Engaging with online platforms, navigating digital resources, and using various software are integral aspects of virtual learning. These requirements force students to learn more about digital devices and become more proficient in operating them for optimal results in their academic endeavours.

Another advantage of virtual learning, as highlighted by students is access to recorded classes. With recorded lectures, students can revisit course materials at their convenience, allowing them to review content when they have a fresh and focused mind. Students saw the ability to pause, rewind, and replay recorded lectures as a notable advantage of virtual learning. This results in the students being able to learn and execute their academic tasks at their own pace. In a virtual learning environment, students also have the freedom to spend extra time on specific topics that require additional attention without the fear of setting the class back. This flexibility allows students to personalize their learning experience.

Furthermore, students highlighted the advantage of reduced social anxiety in virtual learning environments. For those who experience discomfort in face-to-face interactions, virtual

classrooms provide a more comfortable space to engage in academic discussions and freely ask questions without having to worry about stares and uncomfortable exchanges. Additionally, virtual learning eliminates the need for physical commuting to campus, resulting in cost savings for students. The expenses associated with transportation, such as fuel costs, parking fees, or public transportation fares, are significantly reduced or eliminated.

The students also revealed that virtual learning provides them with more free time due to the elimination of commuting and the flexibility of scheduling. This allows them more time to pursue personal interests or extracurricular endeavours. Some students shared that this enhanced mental health and overall well-being, and even encouraged them to manage their time better. Because they became more responsible for their schedules and personal study during virtual learning, they learnt to cultivate the skills of managing their time more effectively and balancing academic commitments with personal responsibilities.

#### 4.3.5.4 *Disadvantages of virtual learning*

While the students had a lot of good things to say about virtual learning, they still had their reservations about it. The most common disadvantages of virtual learning shared by students are the increased potential for distraction, fostering laziness, and the misuse of Internet resources. In a virtual learning environment, some students find it difficult to focus because distractions like their phones and the activities of people they live with are constantly present and unregulated. Additionally, the absence of direct supervision gives them the opportunity for academic dishonesty, such as copying assignments or using internet resources inappropriately during assessments. Specifically, students disclosed that due to the freedom offered by virtual learning, they have become more dependent on software like Grammarly and Quillbot to help them write and edit their coursework, and conduct research on platforms such as TikTok and YouTube, rather than using libraries and more credible sources.

The students also reported that the absence of face-to-face interactions could make it challenging to establish and maintain strong connections with lecturers and fellow students. This makes it harder for those who prefer physical interactions to seek help or engage in meaningful discussions.

Even though virtual learning was praised for reducing or eliminating transportation costs, the unavoidable cost of connectivity that it placed on students emerged as one of its disadvantages.

Some students stated that they simply could not afford to pay for the amounts of data required or would have preferred to spend the money on other needs. This posed a significant burden on some students, particularly those from economically disadvantaged backgrounds.

In addition to the cost of internet connectivity, its unreliability was also frowned upon. Students reported that virtual learning exposes them to some challenges which they hardly have to worry about during contact learning, such as internet connectivity disruptions, hardware malfunctions, and software issues. Students who live in neighbourhoods that suffer from poor internet connection are particularly affected by this. Additionally, power outages due to loadshedding were reported to disrupt the learning process, cause frustration, and result in missed classes or incomplete assignments.

As much as students expressed their individual preferences for contact or virtual learning, many of them stated both advantages and disadvantages of each learning method. This shows that despite their preference for either one, they were not blind to the disadvantages that it may come with. Altogether, the overarching theme that can be deduced from the students' thoughts about contact and virtual learning is that while contact learning leads to deeper relationships and more substantial experiences, virtual learning offers a more immersive intrapersonal exploration of the academic journey, leaving students with new habits and skills.

#### ***4.3.6 Students' Recommendations to Improve the Virtual Learning Experience***

In answering the last research question, students were asked to recommend ways by which the university management and government could have improved the virtual learning experience for students. This section delves into the recommendations in light of the key themes that emerged in the answers provided by the students.

##### ***4.3.6.1 Students' Recommendations for the university management***

When asked if they thought that the university management can do anything to improve students' virtual learning experiences, only two students said 'No'. These two students believed that the university did what they could to make sure that virtual learning was a success, by teaching first-year students how to use Learn and UKZN Library Tools. However, all other students said

that the university management could improve virtual learning, with some of them recommending ways by which they can do so.

One of the primary recommendations put forth by students is the need for the university to offer better and more comprehensive training in digital technology and imperative software skills before the commencement of virtual learning. As virtual learning heavily relies on digital tools and software platforms, the students seek to be better equipped with the necessary skills to effectively navigate these technologies. This is especially the case for students who did not have good or any access to digital technology or develop digital literacy in their secondary schools and are only becoming familiar with this in university. Thus, they recommended that the university organise more specialized workshops that focus on the specific tools they would need for virtual learning.

Another significant recommendation from students is for university management to consider providing them with technology devices like laptops, and additional data support. Some students reported that they face financial constraints that limit their ability to acquire suitable devices or afford consistent internet access, but they want the university to help mitigate this issue. Expressing that the current data allowances offered by the university are at times insufficient, they recommended better data support from the university.

Additionally, some students emphasized the importance of receiving prompt responses from lecturers as a means to improve the virtual learning experience. They recommended that lecturers promptly address student inquiries, provide timely feedback on assignments, and offer better support during virtual learning.

#### *4.3.6.2 Students' Recommendations for the Government*

The majority of the students also expressed that the government can take certain actions to improve the virtual learning experience of South African students. The most recurring recommendation put forth by students is for the government to provide computers and digital literacy programs to primary and secondary schools, aiming to set the right foundation for students in their educational journey. By doing so, they can help ensure that students have equal opportunities to engage with digital tools and gain proficiency in using technology for educational purposes during their foundational years, thereby preventing the struggles that they tend to face if they are only exposed to digital technology at the tertiary level.

Students also emphasized that better infrastructure could be put in place by the government to help ensure reliable Internet connectivity – a crucial resource for effective participation in virtual learning - especially in remote areas and regions with limited connectivity. This will provide the means for all students, regardless of where they live, to engage in virtual classes and access online learning resources easily from the comfort of their homes.

Lastly, the students recommended that the government can do a better job of establishing libraries, workspaces and public Wi-Fi that they can use during virtual learning. These will allow students to study from more conducive and well-equipped spaces, and save on data costs, thereby enabling them to better participate and excel in virtual learning.

#### **4.4 Discussion of Findings**

So far, this chapter has presented the data generated by this study with the aim of providing answers to the research questions. The students' answers reflect their perceptions of and experiences with virtual learning and show the practicality of the theories and concepts highlighted in Chapter Two.

First, the study sought to investigate the types of digital divides that exist among select undergraduate and Honours students at UKZN and understand the factors that contributed to them. As discussed in Chapter Two, the digital divide should be understood as a multifaceted phenomenon rather than a dichotomy of haves versus have-nots (Cisler, 2000; Gunkel, 2003; De Haan, 2004). This is evidenced in the findings above as students reported a variety of factors which influenced their use of technology, including their financial status, family background, geographic location, and infrastructure. Each of these factors affects students differently in both their levels of access and ability to use digital technology. These findings mirrored the work of Faloye & Ajayi (2021), who reported similar factors as contributors to the digital divide among South Africans. However, these students also mentioned the uniquely South African issue of loadshedding as a factor that impacted their use of technology.

The impact of loadshedding as a factor that affects the students' access to digital technology triggers a realization that the digital divide manifests in different ways around the world. Certain circumstances are unique to certain societies or countries and play out in different

ways. With loadshedding, it is such that even those who are considered 'haves' in society are not untouched by its effects. Power outages affect even high-class neighbourhoods, and where there are backup power sources, there is no guarantee of internet connectivity during loadshedding, as connection towers may be down. Thus, nearly everyone gets affected, though to different extents. It is therefore important that digital divide research focuses on the realities of the context in which it is carried out and does not generalize its results to be a global reality.

Furthermore, the argument of Fuchs and Horak (2006), who propose that the digital divide is a phenomenon linked not only to the topic of access but also to that of usage, is supported by the findings of this research. This study demonstrates the merit of examining the digital divide from these two angles. By including questions that encouraged the participants to shed light on the diverse realities they experienced in relation to both their digital access and capabilities, the researcher was able to separately understand and present their access-based realities and their ability-based experiences. For example, there were students who had access to digital technology to the extents that they were satisfied with (most of the students own both a phone and a laptop), but perceived their skill level as only fair and desired better skills. Conversely, some of their peers had limited access to digital technology as they only had a phone, but stated that they were capable of performing all relevant academic tasks on a computer. Ultimately, the data derived from these students proved that the two variables – access and ability – come together to shape the digital learning experience.

Additionally, this research demonstrates Cisler's (2000) argument that the digital divide cannot be examined as a two-way division but it is rather a gradation based on different degrees of access to information technology. There were no two distinct groups to box the participants of this research into, based on their levels of access or ability. Rather, the participants expressed a variety of access and ability dynamics. In some cases, a person had good devices, poor internet connection, and fair abilities, while another had fair devices, poor internet connection, and very good abilities. In other words, the factors that made up one person's access or ability was different from the next person's. The combinations of these factors were nearly infinite, revealing distinct individual realities and consequent experiences. Therefore, the findings of this research confirm that the digital divide refers to 'varying levels' of differences between those with access to, and the ability to use, ICTs.

In investigating the digital divide, this research set out to explore two of Warschauer's (2003) models regarding access to digital technology, namely devices and literacy. However, the experiences accounted for by the students revealed that the third model, regarding conduits, played a crucial role in their digital learning experiences as well. As explained earlier, conduits are those facilities that support the use of a digital device, such as electricity and Wi-Fi or data access (Warschauer, 2003). Three factors discussed in this research that contribute to the digital divide among the respondents of this study included living in rural areas, poor network service providers, and being affected by loadshedding, all of which had a negative effect on their access to digital functions. This highlights that the consideration of conduits is important when understanding the digital divide. The research revealed that those students who live in rural areas, those who settle for cheaper network service providers offering subpar internet connectivity, and those who are severely affected by loadshedding-induced electricity shortages are susceptible to suffering from poor internet quality, which gets in the way of virtual learning. Some of the students affected by the aforementioned factors have satisfactory levels of access to and ability to use digital technology, but the issues they face with inadequate conduits have a significant impact. Thus the impact of conduits in the digital divide must not be overlooked by researchers.

In addition, the findings of this research support Nielsen's (2006) definition of the digital divide in which he argues that certain sectors of the population have substantially better opportunities to benefit from the new economy than others. This is backed by the affirmation that people who lived in rural areas or had weaker family backgrounds and financial statuses were less exposed to digital technology,

Concerning the possession of digital technology, it appears that there are not only 'have-nots' but also 'want-nots' (Van Dijk, 2006). One of the students revealed that their parents and family did not support their use of digital devices while growing up because they did not recognize the positive potential of such devices. This contributed to the student lacking early exposure to digital technology, a reality imposed by lack of motivational access. Motivational access is one of the four levels of access identified by Van Dijk (2006), and it represents the desire to have a computer and to be connected to the internet. This is similar to De Haan's (2004) identification of motivation as a dimension of digital access, referring to attitudes, interests and willingness of individuals to use technology and to include it in their home, work, and educational efforts. In

view of De Haan's (2004) definition, this research also revealed that the requirements of virtual learning increased some students' levels of motivation to use digital technology for educational purposes, as they revealed that they were forced to learn how to use certain functions of a computer or access information digitally. Therefore, necessity fosters motivation in this context. Thus, this research brought to light the importance of motivational access as a factor that contributes to digital access and literacy.

The realization that factors such as conduits and motivation are key variables in the digital divide highlights that digital divide research is indeed a never-ending process of identifying contexts that a researcher needs to decipher, and understanding that these different contexts could reveal even more unforeseen or less-researched variables.

The need to depend on digital technology and internet access during the COVID-19 crisis exposed various levels of digital divides in South Africa (Du Preez et al., 2020). According to Swenson & Ghertner (2020), internet access and usage are largely a privilege of the wealthy and educated, as people in low-income families living in nonmetropolitan areas are less likely to have access to the internet. This is highlighted once again by this research's discussion of family background and financial status as contributing factors to the digital divide among students. Though this research does not seek to generalize its results to represent the whole of South Africa, it cannot ignore the fact that the reality of this group of South African students lines up with what has been discovered about the digital divide in the country by prior research. Of the five digital divide factors in the South African context, as listed by Faloye & Ajayi, (2021), lack of infrastructure, income, family background and urbanization were discovered to be prevalent among the participants of this research.

The motivation for undertaking this research was derived from prominent theories, including Rogers' (1986) diffusion of innovations theory, Van Dijk's (1991) and Castells' (2004) network society theory and Bandura's (1986) self-efficacy theory. In various instances, the evidence obtained through the research provides support and validation for the propositions suggested by these theories, reinforcing their applicability and relevance to the context under investigation.

The findings begin by demonstrating that UKZN indeed forms a network society of sorts, as students are required to use the provided digital platforms to work and communicate. This was

particularly true in the event of virtual learning. The fact that every student questioned had access to a digital device, attached some level of importance to digital platforms, and needed digital technology to count as a student during virtual learning demonstrated that the academic community at UKZN evolved into a full-fledged network society “powered by microelectronics-based information and communication technologies” (Castells, 2004) during the COVID-19 pandemic.

The pressing need to embrace digital technology for virtual learning revealed the crucial role that the diffusion of innovations played. Diffusion of innovations has a significant impact on when, and the extent to which new technologies are adopted. The cost and availability of digital technology affect the adoption of technology for certain individuals and communities, particularly those who are marginalised or have a low income (Digital Divide Network, n.d), leading to slower diffusion rates. This was found to be the reality of some students, who faced a delayed introduction to digital technology, primarily attributed to factors such as their parents’ financial constraints and personal beliefs. Slow diffusion was also caused by a lack of digital devices and digital education in primary and secondary schools. Consequently, the slower diffusion of digital technology within their lives resulted in correspondingly slower development of digital literacy. This, in turn, had a tangible impact on their proficiency in using digital technology for academic purposes during virtual learning. For instance, some students who attended secondary schools where digital literacy was not taught, and did not have access to digital devices at home either, expressed that they felt shocked and stressed by the sudden burden to participate in tertiary education virtually while some of their privileged peers had already figured it out much earlier. Thus, they struggled to learn and catch up fast enough with digital functions at a later stage in life. This effect of diffusion of innovations among the students draws attention to a skill gap, confirming Compaine’s (2001) position that early adopters develop digital literacy and skills earlier and faster than late adopters.

Of the five key factors Rogers (1962) explained that influence the rate and success of diffusion (relative advantage, compatibility, complexity, trialability, and observability), complexity holds particular relevance to this research. According to the findings of this research, students tend to gravitate towards software that makes their academic work easier. This is evidenced in the students’ responses to the question about the disadvantages of virtual learning, where some students stated that it caused them to become lazier and rely on software like Grammarly, and Quillbot to help them write and edit their papers, and use social platforms like

TikTok and YouTube for research. These four examples have two things in common: they are relatively easy to use and offer easy ways to complete academic tasks. This goes to show that students tend to gravitate towards digital innovations that tick two boxes: ease of usage and the ability to ease the complexity of certain academic tasks. Thus, a low degree of complexity is a key feature of digital innovations that attract these students.

The theory of self-efficacy is also applicable to the findings of this study in that it investigated students' perceptions of their levels of digital skills and made substantial findings in that regard. Students shared their thoughts on their self-efficacy in different instances, like rating their ability to perform certain tasks on their phones and laptops, as well as rating their levels of ability to use digital technology for academic purposes in general. Through these lines of questioning, the study discovered that half of the students judged their digital skills to be very good, with only 10% of students claiming to have excellent digital skills. This reveals that there is a moderate level of self-efficacy among the students. However, the study discovered that those students who had moderate or low levels of self-efficacy were impacted by virtual learning such that they began working towards becoming more digitally savvy in order to achieve their academic goals. A cross-analysis of the students' answers to questions addressing their perceptions of their ability to use digital technology and questions addressing the effects of virtual learning on their grades revealed that those students who had a high perception of their digital abilities also believed that virtual learning helped them achieve better grades, as they were functioning in a space where they already had the required skills to succeed. However, it is important to remember that self-efficacy is not a measure of skill; rather, it speaks more to perception as it reflects what individuals believe they can do with the skills they possess (Easton & LaRose, 2000).

The last research question created the need to examine the students' thoughts on how the university and government could help improve virtual learning. The aim of investigating this issue was to see how the measures recommended by the students could contribute to bridging the digital divide. A look at the majority of recommendations given by the students revealed one common theme: digital inclusion. Digital inclusion refers to the activities necessary to ensure that all individuals and communities, including the most disadvantaged, have access to and use of ICTs (NDIA, 2022). According to the Centre for Digital Equity (2023), the provision of affordable broadband internet service, internet-enabled devices, access to digital literacy training, and quality

technical support are some of the means necessary to foster digital inclusion. Similarly, the recommendations put forward by this study include teaching digital technology and imperative software skills, providing digital devices and better data support, providing better digital literacy programs in primary and secondary schools, improving infrastructure to enhance internet connectivity at home, and establishing facilities like libraries and public Wi-Fi outside campuses. Although it is perceived that universities are tasked with the responsibility of building libraries and establishing cyber-literacy study centres (Singh and Gangopadhyay, 2017), the findings of this research revealed that students think the government is tasked with such obligations as well. The students believed that university management and government must fulfil these responsibilities to improve the quality of virtual learning experiences. The students' recommendations are also in line with Bornman's (2016) expression that infrastructure development and the reduction of ICT prices will probably be insufficient to transform South Africa into an information society. The measures recommended by students reach beyond these two solutions and underscore the importance of efforts to improve digital literacy, a crucial concept in this context. Thus, a highly possible end goal of recommendations by students is digital inclusion and ultimately, digital equity.

The findings of this research also spotlight the role of lecturers in bridging the digital divide, and particularly in improving the quality of students' digital learning experiences. In making recommendations for the university management on how to elevate virtual learning, students said that lecturers could be helpful by being readily available to assist students with technology and coursework. This supports the notion that successful integration of technologies occurs when teaching staff focus on the actual learning experiences they make available to students (Marcelo et al., 2015). If educators wish to use these media in schools, they cannot afford to neglect these experiences. Rather, they need to provide students with means of understanding them (Buckingham, 2006). In this case, students desire for lecturers to be more attentive to their experiences, and quicker to provide solutions, both for their technical and academic challenges.

Furthermore, this study describes several advantages and disadvantages of virtual learning. Students readily provided both positive and negative experiences in their academic endeavours. Most of the advantages and disadvantages identified align with the experiences recorded by Stewart (2021) about the effects of switching to remote learning around the world. Both this study

and Stewart's reveal parallel advantages and disadvantages associated with the virtual learning experience. In terms of advantages, both studies highlight improved learning outcomes for certain students and enhanced flexibility in the learning process, as virtual learning was found to allow students more time to engage with their coursework on their own timelines, and in some cases, improve their research skills. On the other hand, both studies also identified common disadvantages, such as increased distractions from family and social media while students learn from home without the supervision of lecturers, and potential lapses in building and maintaining relationships because of a lack of physical contact and meetings. These disadvantages stem from the inherent challenges of remote learning and the absence of face-to-face interactions. The convergence of these findings underscores the need to consider the multifaceted nature of virtual learning and to implement strategies that maximize its advantages while mitigating its disadvantages.

#### **4.5 Conclusion**

This chapter serves as a comprehensive representation of the data collected in this dissertation, offering valuable insights into the characteristics of digital divides among the selected students from UKZN. The interpretation of data has not only confirmed the presence of these divides but has also shed light on their distinct features. By aligning the findings with relevant literature and theories, a robust understanding of the digital realities among the students has been achieved. Based on the collective information presented, it can be concluded that UKZN operates within the framework of a network society, necessitating active online participation from its students. However, it is evident that students' levels of digital inclusion or exclusion vary. As a result, physical and cognitive digital divides exist among the students.

Addressing these divides effectively requires targeted strategies that prioritize accessibility and skill development by university management and government. One approach is to implement training programs specifically designed to impart essential digital skills and knowledge to students. By providing them with structured guidance and instruction on the utilization of important digital platforms, universities can relieve students of the burden of figuring out digital literacy by themselves, thereby helping them feel more supported. These training programs could equip students with the necessary competencies to navigate and leverage digital tools effectively,

ultimately bridging some of the digital divides and fostering digital inclusion. The responsibility also lies with the South African government to enhance the distribution and calibre of digital literacy education in primary and secondary schools nationwide. This is crucial for fostering digital literacy among young students and adequately equipping them for a future where technology assumes a prominent role.

## **CHAPTER 5: FINDINGS AND CONCLUSION**

### **5.1 Introduction**

This study considered how the digital divide and virtual learning during the coronavirus pandemic impacted the learning experiences of Humanities students at University of KwaZulu-Natal. The study sought to discover the digital divides that may exist among the students, understand their experiences as they navigated virtual learning during the coronavirus pandemic, discover any new actions and learning habits that students developed to cope with virtual learning and present the students' insights about how to make virtual learning more feasible in the future.

This chapter will summarize the process by which this research was carried out and present the findings that emerged from the results. It will then share the researcher's reflections on the significance of the findings and offer conclusions that address the research questions. Following that, the chapter will conclude by providing suggestions for potential avenues of future research and discussing the limitations encountered in this study.

### **5.2 Summary**

This research was influenced by pre-existing concepts and theories that relate closely to the topic it sought to investigate. Thus, the researcher first examined these concepts and theories, as seen in the literature review chapter, to determine the extents to which they were apparent in the UKZN context. Understanding these theories and concepts helped to shape the methods by which the research was carried out and the questions that were posed to the participants.

The study was conducted using a qualitative approach. A case study of 30 Humanities students was conducted to arrive at the conclusions. The participants' responses were analysed using percentile analysis and thematic content analysis, as these methods were found to be suitable for addressing the research questions posed at the onset of the study.

The first research question of the study focused on discovering what types of digital divides were evident among Humanities students at UKZN. It was imperative to start by enquiring about these divides and not simply assuming that they existed. Hence, the researcher asked about the impact of certain pre-determined factors that could contribute to students' access and ability to use

digital technology. Furthermore, the students were asked to share other life experiences that they believed had an impact on their relationship with digital technology, and their answers helped to establish the types of digital divides that existed among them. The findings of this study revealed that causes of the divide include family background, financial status, secondary schools attended, personal preferences and choices, living in rural areas, network service providers, and loadshedding. The study also revealed through varying perceptions about their levels of access and ability to use digital technology that digital divides exist among them. However, the findings of the survey showed that the students who were negatively affected by these divides were fewer than those who had positive experiences based on each factor.

Furthermore, the research investigated the experiences of students with virtual learning during the coronavirus pandemic to answer the second research question. It was discovered that although most students had faced varying levels of challenges with accessing digital technology for academic purposes, they were mostly happy with the results that they achieved with the facilities available to them. However, in terms of their usage of digital technology, nearly all students reported that they experienced significant ease and happiness. Therefore, this study highlights that the digital divide among these students, as it affects virtual learning, is based more on access gaps than ability. However, the ability gap, more than the access gap, motivated the students to discuss their challenges with one another in the bid to find help and support.

Looking into the actions taken by the students as a result of participating in virtual learning despite the digital divide, this study discovered that the majority of students struggled to understand coursework and complete assignments during virtual learning. However, these difficulties apparently led them to be more open to academic conversations with their peers, self-driven academic research, critical thinking and extensive studying. These findings provided sufficient answers to the third research question.

Lastly, students' opinions and perceptions of their new learning dynamics were investigated by analysing their comparison of contact learning and virtual learning. More than a third (40%) of students believed that they performed equally well in contact and virtual learning, while there was an even split among the rest of the students. However, when asked to suggest the method of learning that the university continues with post-pandemic, a larger majority (53%) of students suggested mixed learning methods, while contact learning emerged as the least preferred

method of learning. This discovery points to the fact that despite the challenges faced by students during virtual learning, they are not completely averse to it. This is because they believe that virtual learning offers benefits such as improved digital literacy, flexibility to study at their own pace, cost saving on transportation, access to recorded classes, more free time, reduced social anxiety, and improved time management. However, their detailed recommendations for the university and government to improve the virtual learning experience underscore their unhappiness with the challenges they faced and their desire for refinements.

This research found that students expect university management to put more effort into teaching digital technology and necessary software skills, providing digital devices and better data support to improve their virtual learning experiences. They also believe that the government has a responsibility to provide better digital literacy programs in primary and secondary schools, improve infrastructure to enhance internet connectivity in neighbourhoods around the country, and to establish facilities like libraries and public Wi-Fi outside university campuses.

### **5.3 Implications**

The findings of this research have confirmed that digital divides do exist among UKZN students and provided insight into the reasons why they exist. The findings have also revealed that virtual learning led to both positive and negative experiences for students during the coronavirus pandemic.

Additionally, this study has recommended solutions to the problems faced by students regarding their access to and use of digital technology for virtual learning. This study has deliberately sought the opinions of the students in order to discover the new challenges that virtual learning and the digital divide posed to them and illuminated their proposed solutions to these challenges. Consequently, this study has emphasized the need for universities to invest in providing solutions to both the access and ability gaps among students. Also, light has been shed on the fact that the government has a huge role to play in determining the digital landscape of the nation, and their efforts in this regard have a substantial impact on all levels of the education sector.

#### **5.4 Recommendations**

This study has provided a much-needed glimpse into the existence of digital divides among UKZN students, as well as the factors that account for these divides. It would however, be worthwhile to test these conclusions on a larger scale in order to see if the same realities exist across different faculties and colleges in the university. The learning requirements and outcomes set for students of the diverse fields of study at UKZN are different, and so are their approaches to virtual learning. Thus, it is recommended that similar studies be conducted in other Colleges, as well as other universities across South Africa.

The results of such research projects will reveal the extent to which similarities and differences occur in the realities of students across the university and the country, as it concerns their experiences with virtual learning. Such studies will also help to expose factors that contribute to the digital divide in South Africa, thereby helping key stakeholders see how they can better direct their efforts towards bridging the digital divide.

Additionally, a notable discovery of this research is that gender did not appear to be a contributor to the digital divide among the students. This discovery goes against typical assumptions that gender contributes to South Africa's digital divide and that men are more digitally literate than women (Bornman, 2016; ITU, 2012; Van Dijk & Hacker, 2003). Hence, more in-depth qualitative research into the role of gender in the digital divide within and outside the university environment is recommended.

In addition, based on the South African government's recent introduction of digital technology skills to the primary school curriculum, more students may soon have better physical and cognitive access to digital technology during their foundational years. Consequently, these students may not share the current reality of the participants of this study, some of whom have been negatively impacted by a lack of exposure to digital technology during their early school years. Therefore, it would be relevant to conduct future research into their digital realities and digital divides when these younger students become university students and compare them to the realities that exist today. This will represent a good way to measure whether the digital divide gap has closed over the years.

In terms of students learning culture as they explore virtual learning, this study has established that students are dependent on a wider range of internet-based information sources for

their academic research. Seeing as many of these sources are not well-regulated and could offer false information, it would be helpful to conduct further research that looks into students' ability to recognize truth versus misinformation and filter through their online sources. An understanding of how students receive digital information and apply such to their academic lives will contribute to digital literacy education, university curriculum development, online safety and risk awareness, as well as internet policy making and regulation.

Lastly, it would be interesting to compare the experiences, habits and academic outcomes of students who, before the COVID-19 pandemic, attended University relying solely on contact learning and those who have had to navigate both virtual to contact learning due to the pandemic. Such a comparison may reveal results that will be useful for educational institutions and policy-makers in determining the effects of the different learning methods.

## **5.5 Limitations**

One limitation that this research faced is that due to its timing, there was not much in-person lecturing/contact learning for the students to refer to when giving answers to questions that ask them to compare their virtual learning experiences with their in-person learning experiences. The current third-year and Honours students, who represent the respondents that have been in the University system for the longest, began their studies between 2020 and 2021, which marked the beginning of the Coronavirus pandemic and by extension, the migration to virtual learning. Hence, they have only experienced contact learning at the University for only a few months in 2023. Therefore, it is possible that some respondents answered the comparison questions without a full scope of contact learning, as they had spent more time learning virtually.

Another limitation of this study is the sample size. Thirty students across different years of study were recruited for this research. It is possible that, due to this being a relatively small sample group, it may not be completely representative of the Humanities student population. However, the researcher chose this sample size in order to effectively conduct the thematic content analysis, as larger sample sizes can potentially have a negative impact on this analysis method. Additionally, the selected sample size was intended to prevent an excessive data collection period and any associated negative consequences. Hence, it is advisable that future research, especially if it happens to be a group study, uses an increased sample size.

Also, due to the sample size, the results of this research cannot be generalized to account for the entire UKZN population. However, this limitation cannot be seen as a negative one because this research was never aimed at getting results that would be generalized. However, the research will still be able to help the University management to see how students are experiencing virtual learning, and this can help with the formulation of general improvements in teaching, learning, and support systems.

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# APPENDIX 1

## ETHICAL CLEARANCE LETTER



16 March 2023

**Oyinkansola Oyindamola Akinlabi (220109377)**  
School Of Arts  
Pietermaritzburg Campus

Dear OO Akinlabi,

**Protocol reference number: HSSREC/00005258/2023**

**Project title:** Understanding the impact of the digital divide and new methods of learning on humanities students at University of KwaZulu-Natal during the coronavirus pandemic

**Degree:** Masters

### Approval Notification – Expedited Application

This letter serves to notify you that your application received on 06 February 2023 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**.

**Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.**

This approval is valid until 16 March 2024.

To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

HSSREC is registered with the South African National Health Research Ethics Council (REC-040414-040).

Yours sincerely,

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**Professor Dipane Hlalele (Chair)**

/dd

### Humanities and Social Sciences Research Ethics Committee

Postal Address: Private Bag X54001, Durban, 4000, South Africa

Telephone: +27 (0)31 260 8350/4557/3587 Email: [hssrec@ukzn.ac.za](mailto:hssrec@ukzn.ac.za) Website: <http://research.ukzn.ac.za/Research-Ethics>

Founding Campuses: ■ Edgewood ■ Howard College ■ Medical School ■ Pietermaritzburg ■ Westville

INSPIRING GREATNESS

1/1

## **APPENDIX 2**

### **PARTICIPANT CONSENT LETTER**

#### **Understanding the Impact of the Digital Divide and New Methods of Learning on Humanities Students at UKZN during the Coronavirus pandemic**

Good day participant. I hope you are well.

My name is Oyinkansola Akinlabi. I am a Masters student from the Media and Cultural Studies Department at the University of KwaZulu-Natal. My cell number is 0685620368 and my email address is 220109277@stu.ukzn.ac.za.

You are being invited to consider participating in a study that involves research into Understanding the Impact of the Digital Divide and New Methods of Learning on Humanities Students at UKZN during the Coronavirus pandemic. The aim and purpose of this research is to understand the experiences that students had with digital technology and online learning while studying virtually during the past few years. The study is expected to enrol 100 participants – 50 second year and 50 third year Humanities students. It will involve the following procedures collecting your answers in a questionnaire via Google Forms. The duration of your participation if you choose to enrol and remain in the study is expected to be approximately 15 minutes to fill out the questionnaire.

I hope that the results of my research will help to better understand students' experiences with digital media for virtual learning and recommend to the University and government ways by which students will prefer to be supported in the event that a need for virtual learning arises again.

Participation in this research is voluntary, and I will not force you to engage in anything that you are uncomfortable with and I offer you the option of withdrawing from the project at any time with a full promise of confidentiality regarding whatever information you have contributed. You will not be forced to answer any questions against your will.

Every effort will be made to ensure your confidentiality is protected and no identifying information will be used in the final project without your express prior consent. Once the research is complete, all notes and transcripts will be destroyed. You will be given full access to the final project to assess the final outcomes of the research.

This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee (Protocol Reference Number HSSREC/00005258/2023).

If you have further questions regarding this project, you may contact me, my supervisor or the University of KwaZulu-Natal's Ethics Office. Our email addresses and phone numbers are as follows:

STUDENT NAME, EMAIL & PHONE NUMBER;

Oyinkansola Akinlabi

220109377@stu.ukzn.ac.za

068 562 0368

SUPERVISOR NAME, EMAIL & PHONE NUMBER;

Dr. Sandra Pitcher

Pitcher@ukzn.ac.za

033 260 5542

In the event of any problems or concerns/questions you may contact the researcher at contact details provided above or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows:

**HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION**

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557- Fax: 27 31 2604609

Email: HSSREC@ukzn.ac.za

Thank you for your time!

## **AGREEMENT TO PARTICIPATE IN RESEARCH PROJECT**

Please select 'I agree' below to give your consent and participate in this survey. Thank you.  
I have been informed about the study entitled Understanding the Impact of the Digital Divide and New Methods of Learning on Humanities Students at UKZN during the Coronavirus pandemic by Oyinkansola Akinlabi.

I understand the purpose and procedures of the study.

I have been given an opportunity to answer questions about the study and have had answers to my satisfaction.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any of the benefits that I usually am entitled to.

If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at 220109377@stu.ukzn.ac.za or 0685620368.

I agree: \_\_\_\_\_

**APPENDIX 3**  
**RESEARCH QUESTIONNAIRE**

**SECTION A: BACKGROUND INFORMATION**

**INSTRUCTION:** Kindly indicate your response to each of the questions below by selecting the appropriate option and specifying when necessary.

**Gender:** Male ( ) Female ( )

**Age:** 18-20yrs ( ) 21 – 25yrs ( ) 26 – 30yrs ( ) 31- 35yrs ( ) 36 – 40yrs ( ) Above 40yrs ( )

**For how many years have you been a student at UKZN?** \_\_\_\_\_

**What is your current level of study?** 1<sup>st</sup> Level ( ) 2<sup>nd</sup> Level ( ) 3<sup>rd</sup> Level ( )

**When you are not on campus, where do you live (please state your neighbourhood, city and province)?** \_\_\_\_\_

**SECTION B: DIGITAL LITERACY, ACCESS TO DIGITAL TECHNOLOGY THE DIGITAL DIVIDE**

**INSTRUCTION:** Kindly indicate your response to each of the following questions by selecting the appropriate option and explaining when necessary.

1. Do you own a phone that can connect to the internet? Yes ( ) No ( )

2. Do you own a laptop that can connect to the internet? Yes ( ) No ( )

3. Do you use your phone for academic purposes? Yes ( ) No ( ) I do not have a phone that connects to the internet ( )

4. Do you use your laptop for academic purposes? Yes ( ) No ( ) I do not have a laptop that connects to the internet ( )

5. How often have you had to repair your phone over the past year?

Never ( ) 1 to 3 times ( ) 4 to 6 times ( ) 7 to 10 times ( ) I do not have a phone ( )

6. How often have you had to repair your laptop over the past year?

Never ( ) 1 to 3 times ( ) 4 to 6 times ( ) 7 to 10 times ( ) I do not have a laptop ( )

7. Do you benefit from the Wi-Fi connection on campus? Yes ( ) No ( )

8. When you are not on campus (at home, off-campus residences), how often do you have access to data or Wi-Fi connection for your academic work?

All the time ( ) A few hours a day ( ) 4 to 6 hours a week ( ) Less than 6 hours a week ( ) Never ( )

9A. Please select what processes you know how to perform on your phone. Select as many options as are relevant to you. (Tick all that apply)

Typing documents ( ) Sending emails ( ) Conducting internet searches ( ) Using UKZN Learn (Moodle) ( ) Using UKZN Library Tools ( ) Using other software that are relevant to my academics ( )

9B. Please select what processes you know how to perform on a desktop or laptop computer. Select as many options as are relevant to you. (Tick all that apply)

Typing documents ( ) Sending emails ( ) Conducting internet searches ( ) Using UKZN Learn (Moodle) ( ) Using UKZN Library Tools ( ) Using other software that are relevant to my academics ( )

9C. Which of the processes you selected in questions 9A and 9B did you receive formal training for (through UKZN or other learning platforms)?

Typing documents ( ) Sending emails ( ) Conducting internet searches ( ) Using UKZN Learn (Moodle) ( ) Using UKZN Library Tools ( ) Using other software that are relevant to my academics ( )

10. Please list examples of other software that are relevant to your academics which you know how to use on a phone or laptop.

11. How would you rate your overall level of access to digital technology for academic purposes?

Excellent ( ) Very Good ( ) Good ( ) Fair ( ) Poor ( )

12. How would you rate your overall ability to use digital technology for academic purposes?

Excellent ( ) Very Good ( ) Good ( ) Fair ( ) Poor ( )

13. A) How do you think that your family background has influenced your use of digital technology? Positively ( ) Negatively ( ) No influence ( )

B) Briefly explain your answer to 13A

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14. A) How do you think that your financial status has influenced your use of digital technology? Positively ( ) Negatively ( ) No influence ( )

B) Briefly explain your answer to 14A

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15. A) How do you think that the high school you attended has influenced your use of digital technology? Positively ( ) Negatively ( ) No influence ( )

B) Briefly explain your answer to 15A

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16. A) Based on your personal choices and preferences, do you enjoy using digital technology such as phones and laptops? Yes ( ) No ( ) I am indifferent ( )

B) Kindly give examples of actions you enjoy performing with digital technology (both academic and non-academic actions)

17. A) Are you aware of any other factor(s) that influence your use of digital technology?

Yes ( ) No ( )

B) If you answered 'Yes' to 17A, please list and briefly explain the other factor(s)

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### **SECTION C: THE DIGITAL DIVIDE AND STUDENTS' EXPERIENCES WITH VIRTUAL LEARNING DURING THE COVID 19 PANDEMIC**

**INSTRUCTION:** Kindly indicate your response to each of the following questions by ticking the appropriate option. Please read the questions carefully before selecting your answer.

When you consider your virtual learning experience in terms of your **level of access** to digital technology (device and internet connection) for academic purposes, to what degree have you experienced the following?

		Never	Rarely	Occasionally	Often	Always
18.	Ease of Access to the appropriate devices and internet connection to fulfil academic tasks					
19.	Happiness with the results you are able to deliver with the devices and internet connection available to you					

20.	Inspiration or determination to improvise or make do with the available devices and internet connection					
21.	Desire to socialize and discuss with other students about your challenges with accessing digital technology for academic work					
22.	Stress, anxiety or frustration due to the inadequacy of digital devices and internet connection available to you?					

When you consider your virtual learning experience in terms of your **level of ability** to use digital technology for academic purposes, to what degree have you experienced the following?

		Never	Rarely	Occasionally	Often	Always
23.	Ease of Use of the digital technology needed for your academic tasks					
24.	Happiness with the results you are able to deliver with your level of ability to use digital technology for academic purposes					
25.	Inspiration or Determination to learn how to make the best use of digital technology for academic purposes					
26.	Desire to socialize and discuss with other students about your challenges with using digital technology for academic work					
27.	Stress, anxiety or frustration due to the					

	inadequacy of your digital skills to achieve desired results.					
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**SECTION D: IMPACT OF THE VIRTUAL LEARNING ON STUDENTS' APPROACH TO ACADEMIC ENDEAVOURS**

**INSTRUCTION:** Kindly indicate your response to each of the following questions by selecting the appropriate option and explaining your answer where necessary.

How has the need for virtual learning impacted your approach to your academic endeavours?

		Strongly disagree	Disagree	Neither Agree nor disagree	Agree	Strongly agree
28.	I struggle more to understand my course work					
29.	I struggle more to complete my assignments					
30.	I am more open to academic conversations with my classmates					
31.	I am more open to researching sources outside of what the lecturer teaches					
32.	I think more critically when completing academic tasks					
33.	I communicate more effectively with other students					
34.	I communicate more effectively my lecturers					
35.	I now read/study more than I usually would					
36.	I am inspired to put in more effort					
37.	I am more concerned about my grades					

38	I am able to build better relationships with lecturers and students					
39.	I feel like giving up on tertiary education					

40. Apart from the above-listed examples, in what other ways has virtual learning impacted the way you approach your academics?

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**SECTION E: HOW STUDENTS COMPARE VIRTUAL LEARNING TO CONTACT LEARNING**

**INSTRUCTION:** Kindly indicate your response to each of the following questions by selecting the appropriate option and explaining when necessary.

41. A) Based on your experience with virtual learning and contact learning, where do you believe you thrive better? Contact ( ) Virtual ( ) Neither ( ) Both equally ( )

B) Please give reasons for your answer to 41A

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Please select the form of learning (contact learning or virtual learning) that you believe would deliver better results in the listed areas.

		Contact learning	Virtual learning	Both will deliver the same results
42.	Better understanding of coursework			
43.	Better opportunities to ask questions			
44.	Better opportunities for research			
45.	Better grades			
46.	Better relationships with lecturers and other students			

47. What do you think are the advantages of contact learning?

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48. What do you think are the disadvantages of contact learning?

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49. What do you think are the advantages of virtual learning?

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50. What do you think are the disadvantages of virtual learning?

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**SECTION F: RECOMMENDATIONS FOR THE UNIVERSITY AND GOVERNMENT TO IMPROVE VIRTUAL LEARNING**

**INSTRUCTION:** Kindly indicate your response to each of the following questions by selecting the appropriate option and explaining when necessary.

51. A) Do you believe that the university leadership can put in any measures to help improve students' experiences with virtual learning? Yes ( ) No ( )

B) Please explain your answer to 51(A).

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52. A) Do you believe that the government can put in any measures to help improve students' experiences with virtual learning? Yes ( ) No ( )

B) If you answered Yes to 52A, please explain some of these measures.

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C) If you answered No to 52A, please explain your answer.

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53. A) What kind of learning would you recommend that the university continues with if the pandemic dies down? Contact ( ) Virtual ( ) Mixed ( )

B) Please explain your reason for your choice in 53A.

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