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**Exploring Master's Students' Experiences of using
Digital Technologies in Research**

By

Lerato Hlengiwe Sokhulu

(211518808)

**A thesis submitted in fulfilment of the requirements for a Doctor of Philosophy
degree in Curriculum Studies.**

**School of Education, College of Humanities, University of KwaZulu-Natal,
Durban, South Africa.**

Main Supervisor: Professor Simon Bheki Khoza

Co-Supervisor: Doctor Nomkhosi Nzimande

July 2021

SUPERVISORS STATEMENT

This thesis has been submitted with our approval.



Main supervisor: Professor Simon Bheki Khoza



Co-supervisor: Doctor Nomkhosi Nzimande

Declaration

I, Lerato Hlengiwe Sokhulu, declare that the research reported in this doctoral dissertation, titled **Exploring Master's Students' Experiences of using Digital Technologies in Research**, is my own work; and all sources used have been acknowledged in-text and in the reference list accordingly. Furthermore, this research study has not been submitted in any other institution of higher learning for degree considerations or any other academic purposes.

Signature: 

Lerato Hlengiwe Sokhulu

Student number: 211518808

Date: 30 July 2021

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Dedication

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&

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ABSTRACT

Digital technologies are used by people in order to attend to 21st century living, which often involves digitalised practices. These digitalised practices are driven by the need to meet the Fourth Industrial Revolution (4IR) technology innovation, demanding the growing use of digital technologies for various activities. As a result of the 4IR movement, institutions of higher learning use digital technologies for teaching, learning, and research purposes, to fulfil educational objectives. Particularly for postgraduate studies, students use digital technologies to access published research, generate empirical data, write their dissertations and communicate with their supervisors and other stakeholders involved in their research studies. Literature reviewed in this study indicated that students experience the use of digital technologies in specific ways informed by various socialisation and professionalisation processes. This study explored master's students' experiences of using digital technologies as informed by their personal research needs; thus, producing a unique personalisation experience which has been found to be missing in literature discussion. Guided by the philosophical pragmatic paradigm, this doctoral study used a qualitative case study to explore master's students' experiences of using digital technologies for research purposes. Data were generated using four research methods, including reflective journals, semi-structured interviews, focus-group discussions, and digital observations. Purposive and snowball sampling were used to select fourteen participants who were part of the study, and who aided in generating thick and authentic data used to answer the research questions. Three key research questions were formulated for this study mainly: What are master's students' experiences of using digital technologies? (descriptive); How do master's students apply their experiences of using digital technologies in research? (operational); and Why do master's students experience digital technologies in particular ways? (philosophical/theoretical). The data produced were analysed and interpreted using inductive (thematic) analysis, in combination with deductive analysis (using the Persona-Tech analytical framework proposed in this study). The Persona-Tech analytical framework was conceptualised using selected concepts from CHAT and UTAUT theories, in order to better understand students' experiences of using digital technologies in research.

The findings of this study indicated that participants experienced the use of digital technologies both in positive and negative ways, influenced by various factors such as socialisation, professionalisation and personalisation. These influences further shaped how the students conducted their master's research using different digital resources on a mandatory and voluntary basis. Furthermore, the

findings suggested that master's students used their socialisation and professionalisation experiences to solve problems and better understand the use of digital technologies in their studies, resulting in a unique personalisation experience informed by their study needs. The study recommends five propositions that could aid in students achieving quality personalisation experience with regards to using digital technologies effectively for their studies. These five propositions include students reflecting on their experience with digital technologies and finding ways to improve their experience; forming collaborations with other stakeholders and seeking ways to tackle challenges experienced with digital technologies; having patience and enduring through a challenging experience; seeking guidance, support and information where deemed necessary and being self-aware of one's digital strengths and weaknesses.

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CHAPTER ZERO: Researcher's Positionality for the study

0.1 Candidate Statement

I conducted this study triggered by three experiences in my life, mainly the personal, social and professional experiences, which have helped me with developing myself academically and finding my passion for research. Throughout my life, I have always been a self-driven, determined and goal-oriented individual. Therefore, from a young age (at primary-school level), I knew that I wanted to become educated like my father who was a teacher. However, I also understood that I was not limited in this aspiration – I could still aspire to be more. My mother encouraged me to always pursue my studies and to put effort into every activity in which I engaged. Even though I did not grow up with many resources (technological or otherwise), my aspirations, motivation, and the teaching of my parents were some of the main drivers of my academic success. After passing my matric in the year 2010, I was offered the opportunity to study for a Bachelor of Education degree (B.Ed.) at a local university in South Africa where digital technologies were used for teaching, learning, and research purposes.

In the new university space, I struggled with using specific digital technologies; however, I persisted determinedly, and eventually adapted to the new environment with the aid of professionals (lecturers) and the social support received from friends and other students. I completed my B.Ed. study in 2014 and began teaching at a local school the following year. Nevertheless, I continued to pursue my postgraduate studies (Honours in Curriculum Studies), where I fell in love with academia, met inspirational academics, and was eager to learn more and develop myself in this field. Obtaining two degrees (B.Ed. & B.Ed. Honours) in humanities, has enabled me to understand the value of multiple perspectives and socialisation. Through my B.Ed. studies and my teaching experience, I acquired communication skills which have contributed to my social engagement with people. With Honours research, I was able to understand that people perceive issues differently; hence social realities also differ, leading to multiple perspectives.

During my Honours study, we were also using digital technologies to conduct our research. However, through this experience, I was intrigued by how most of my colleagues (other

postgraduate students) were struggling to use digital technologies at postgraduate level. Upon completing my Honours, I enrolled in a Master's in Education (M.Ed.) coursework in Curriculum Studies. This study programme was one step towards developing further in my newly discovered passion of becoming an academic. While studying towards my master's programme I noted a similar use of digital technologies as evidenced in my Honours experience. Interestingly, I also had to keep up with the evolving digital technologies, as the university kept introducing new software for students to use in their academic studies. I became more interested in exploring the topic of using digital technologies in research, seeing that we had diverse digital needs as postgraduate students.

Towards the end of my master's study, I was awarded a prestigious scholarship by the university to study towards a Doctoral degree in Education (PhD). This was a marvellous opportunity that enabled me to take the final step to officially becoming a full academic. It is worth noting that, through my master's study, I had developed in-depth professional knowledge about research concepts and methodologies. Thus, my observations, personal experiences with digital technologies, academic interests and professional research knowledge and skills added to the drive to conduct this study, qualifying me as the best candidate for the work. As a result, when I enrolled for the PhD programme, I was adamant about exploring students' experiences of using digital technologies in research. This was particularly because I had developed a personal rationale for the study; and that digital technologies were constantly evolving. New software and hardware resources were being introduced to undergraduates and research students. This technological innovation was in line with the Fourth Industrial Revolution (4IR) movement, which digitalised almost all practices to meet the needs of 21st century living.

Therefore, in conducting this study, I wanted to gain in-depth insight into postgraduate students' (particularly master's) experiences of using digital technologies in research. The aim of this study was to be provided with a clear understanding of the use of digital technologies in research based on students' real-life experiences. With this study also, I wanted to find out what drives students to use specific digital technologies, particularly those which are not prescribed for them. In addition, I wanted to discover which experiences have contributed to their competencies in digital technologies for research purposes. Moreover, throughout the journey of this PhD study, I have developed a philosophical understanding of these students'

experiences. I have also advanced in my academic knowledge and writing skills. I am now able to theorise on findings, and to generate a new framework, as contributions to the field of academia (Curriculum Studies and Educational Technology). I have also been able to publish an article drawing from my PhD research findings. My publication mainly reflects on master's students' experiences of conducting studies using digital technologies during the COVID-19 period. Writing and publishing this article under the strenuous times of COVID-19 has increased my confidence as a novice academic. It has encouraged me to publish more papers in the future. In addition, through conducting this PhD study, I have found my research niche and identity in the academic space. I would like to use this area of expertise to publish more journal articles as a means of contributing towards the university's research goals. I also want to generate new knowledge and understanding that can guide the use of digital technologies in higher education and research.

Furthermore, through conducting this study I have identified that human actions are driven by personal intelligence, which is, in turn, informed by individual needs. These actions can be drawn from either socialisation or professionalisation processes, to cater for these needs; therefore, contributing towards the individual's unique personalisation experience. Likewise, I was able to use both socialisation (human social interaction) and professionalisation (formal research knowledge and skills) experiences to develop a clear rationale. These personal developments led to successfully conducting this study, thus attending to my research and academic needs.

CHAPTER ONE

INTRODUCTION AND BACKGROUND OF THE STUDY

1.1 Introduction

There are four phases to the Fourth Industrial Revolution, which involve the invention and constant innovation of digital technologies. Even though there is no single conceptualisation of what constitutes the ‘Industrial Revolution,’ literature (Bloem et al., 2014; Drath & Horch, 2014; Kagermann, Helbig, Hellinger, & Wahlster, 2013; Liao, Deschamps, Loures, & Ramos, 2017) indicates that the first three Industrial Revolutions have already occurred in the past two centuries (19th and 20th) as a result of (1) mechanical manufacturing based on water and steam; (2) introduction of electricity for mass production; and (3) the use of digital electronics and Information Technology (IT). Currently, there is a shift towards the 4th Industrial Revolution (4IR) which has improved the integration of digital technologies in such a way that everything may be connected to everything digitally (Bloem et al., 2014). As a result, digital technologies create a link between the digital and physical world where there is digitalisation of many activities, including those of teaching, learning, and research in higher learning institutions (Schwab, 2017). In other words, people in various domains can use digital technologies to accomplish activities without having physical contact with one another.

Globally, the higher education sector has introduced the use of digital technologies at all academic levels (undergraduate and postgraduate studies) to be used by both academics and students as part of moving towards the 4IR (Bates, 2015; Wankel, 2011). Moreover, Yusuf (2005) asserts that the digitalisation of academic activities brought by the 4IR propelled research to be conducted using various digital technologies. As a result, postgraduate students use digital technologies to promote various experiences (socialisation or professionalisation) during the course of their research studies. Thus, this study found it essential to explore what the experience of the 4IR means, particularly in higher education, and for postgraduate (master’s) students in terms of conducting research studies.

Various studies have been conducted on the experiences of using digital technologies. However, many of these studies have been explored outside educational research practices (Abubakar & Ahmad, 2014; Al-Awadhi & Morris, 2008; Qingfei, Shaobo, & Gang, 2008;

Waehama, McGrath, Korthaus, & Fong, 2014). Similarly, Butler-Adam (2018) argues that there has been little discussion on how higher education institutions contribute towards the 4IR, even though the implications of digital practices may be extensive. These findings suggest a need for more studies to be conducted within higher education to explore research students' experiences of digital technologies. Furthermore, this study is essential because it adds to the current debates on how higher education institutions are moving towards the 4IR regarding their research practices, drawing from master's students' experiences. This exploration is pivotal in academia, as it enables an understanding of the impact of digital technologies in research-related activities (Xing & Marwala, 2017).

Butler-Adam (2018) posits that researchers in relevant disciplines must indicate how digital technologies can be made useful in their field of study to prepare for the upcoming digital revolution (4IR). Therefore, this study takes upon itself a duty to explore master's students' experiences of using digital technologies in research, to reveal their practices as informed by their socialisation, professionalisation, and personalisation experiences. Thus, this chapter aims to introduce the study and its purpose in exploring master's students' experiences of using digital technologies in research. This chapter provides the background of the study, the rationale, the significance of conducting this research, and a brief overview of the study that outlines the entire research project.

1.2 Background and Context of the Study

According to Xing and Marwala (2017), university students studying during the transition to the 4IR are faced with the reality of using digital technologies to conduct and complete their academic activities. This digitalised experience presents various opportunities and issues to the higher education sector. One of the issues universities face is finding their identities in this new reality of digitalised practices (Xing & Marwala, 2017). Moreover, it is worth noting that universities consist of a variety of stakeholders such as academics and students who use these digital technologies to produce academic work. Their unique experiences with digital technologies therefore shape how universities identify and position themselves in the shift towards the 4IR. This study explores master's students' personalised experiences with digital

technologies as informed by their social and professional experiences. Thus, identities that contribute to the 4IR transition in research are thus revealed.

Professional experiences refer to the use of digital technologies for formal learning and research, while social experience is the use of digital technologies for social activities such as entertainment which may support learning (Khoza, 2017). Amory (2014) further indicates that students use these digital technology resources to support their social and professional learning experiences. Similarly, Khoza (2016) asserts that the introduction of digital technologies has allowed students in higher education to use digital technology for both societal and professional experiences. However, scholars such as Amory (2014); and Khoza (2016) may not have considered that students can also use digital technologies to address their personal needs. For example, Khoza (2017) conducted an interpretive case study which found that ten master's students' use of Skype software was driven by personal, social and professional experiences. These findings suggest that, of the three experiences (social, professional & personal), personal experience which addresses individual needs, is under-researched (Khoza, 2018). Therefore, this study is important because it explores all students' experiences, including personal, social, and professional experiences, to address research needs. In this way, students' personal experiences with digital technologies are revealed, informed either by social or professional experiences, or by both.

Also, as the above studies (Amory, 2014; Khoza, 2016, 2017, 2018) have indicated, students use digital technologies to address their social, professional, and personal experiences. Arguably, researchers have discussed these experiences from a static position (social, professional, and personal). This study has reconceptualised these experiences into *socialisation*, *professionalisation* and *personalisation*. Thus, as part of the 4IR technical innovation, an infinite process in use is exposed as digital technologies constantly evolve to meet the needs of various users.

Moreover, studies such as those of Amory (2014); Czerniewicz et al. (2014); and Khoza (2016) categorised the various digital technology resources according to hardware (machines) and software (applications) to indicate the differences between tangible and non-tangible digital

resources. For instance, laptops, USB flash drives, and cellphones are examples of hardware resources. By contrast, emails, learning management systems (LMS), and Skype are examples of software resources. Khoza (2015, 2016a, 2017) further developed the concept of ideological-ware resources. These refer to various theories and ideologies, such as the cultural historic activity theory (CHAT) that guides the use of digital technologies. Thus, students must make use of hardware, software and ideological-ware resources in order to be able to share their experiences that would reflect their unique knowledge, skills, values and attitudes towards the use of digital technologies in research (Pather, 2017).

Furthermore, as the higher education sector prepares for the emerging 4IR driven by digital technologies, it is also expected to introduce a variety of digital technology software. Examples of these software include LMS, Skype, Zoom, and emails to be used by their students and communities for teaching, learning, and research purposes. When these digital technologies are introduced, however, they come with new demands in terms of what the digital technology users experience, based on their knowledge, skills, and values (Amory, 2014; Khoza, 2013). On this note, a survey conducted by Prensky (2001) on the use of digital technologies by university students and their lecturers, concluded that students' experiences were different from that of their lecturers in terms of using these digital technologies. The study was conducted in the United States and on the one hand, Prensky (2001) established that students enjoyed the use of digital technologies because they were born in the digital technology period, thus were digital natives. On the other hand, the lecturers were challenged by digital technologies because digital technologies were new to them. Generally speaking, these lecturers were born long before the digital period (digital immigrants). Moreover, older postgraduate students tend to have similar experiences with digital technologies as the lecturers identified in Prensky's study. This similar experience is revealed in Khoza and Manik's (2015) study: older postgraduate students were also identified as digital immigrants. These students were therefore, also struggling with digital technologies in attending to their research needs. In addition, Khoza and Manik's (2015) case study concluded that most postgraduate students who identify as digital immigrants need more support in learning how to use digital technologies. Because they lack sufficient knowledge and skills to use technologies in their studies.

On the contrary, Thomas (2016) argues that, for university students, research and learning experiences have been enhanced by the use of digital technologies. Similarly, Blackwell, Lauricella, and Wartella (2014) indicate that various stakeholders in higher education value digital technology because they believe it may enhance students' academic performance. However, Dlamini (2018) notes that South Africa lacks empirical evidence to prove that digital technologies enhance learning and research experiences. This study is significant because it provides empirical evidence on master's students' experiences of using digital technologies in research. Thus, it adds to the existing body of knowledge on students' experiences with digital technologies, especially revealing the South African perspective on whether these experiences are positively enhanced or have offered various challenges.

1.3 Rationale for the Study

The development of digital technologies in higher education happens when the use of digital technologies is mainly driven by professional experience (Underwood, 2009). Studies by Khoza (2016a, 2017) and Singhal and Rogers (2012) add that, even though digital technologies may be used for formal education (professional practice), they were originally designed for entertainment or social experiences. These findings suggest that students can use digital technologies not only to promote professional experiences but also social experiences. These studies also imply that both social and professional experiences may be important in conducting academic activities in higher education. Therefore, there is a need to combine both forms of experience to bring out a unique experience driven by individual needs, hence the significance of this study. This study aims to explore master's students' personalisation experience of using digital technologies as influenced by socialisation and professionalisation experiences.

Desktop research from Passey and Higgins (2011) and Higgins, Xiao, and Katsipataki (2012) claim that students who are well-motivated and experienced in using digital technologies can conduct their studies more effectively. This use of digital technology for formal learning accounts for the professionalisation experience (Khoza, 2017). However, whilst Higgins et al. (2012), and Passey and Higgins (2011) provide a solid argument about the experience and motivation of students using digital technology, their studies are limited in that they do not draw from empirical findings to conclude on the first-hand experiences of participants. This

study is different in that it empirically explores master's students' experiences of using digital technologies in research to generate first-hand findings.

The interest in conducting this study was triggered by three aspects: personalisation, socialisation, and professionalisation experiences. Personally, I had enrolled in the University of KwaZulu-Natal (UKZN) as a first-year undergraduate student. I had very little knowledge of and skill with digital technologies. My background added to this impact in that I had had no experience with digital technologies before my university studies. During my first year of study for my Bachelor of Education (B.Ed.), I registered for a module that introduced me to the use of digital technologies for professional practices. Beyond my first year, my experiences in learning to use digital technologies to attend to my studying needs depended on social learning. This social learning experience included learning how to use a computer and other technologies by enquiring from other students. The experience of learning how to use digital technology from other students accounted for the socialisation experience meeting my personal study needs. The university offered me very minimal learning about digital technologies and their usage, yet studying was emerging into online learning, shifting away from traditional modes of learning. I also did not personally prepare myself for the use of digital technologies as I was not aware that they were used for learning and research purposes at university.

During my Honours study, I observed that most of my fellow students did not know how to use a computer. They could not access student drives, student email, the modular object oriented dynamic learning environment (Moodle), and other online digital learning platforms. It was usually up to the lecturer to help students adjust and become familiar with using these digital technologies. This experience suggested that during my Honours studies, socialisation experiences were most prominent. Students learnt socially how to apply digital technologies since there was no formal programme set for them to become familiar with digital technologies. The university had introduced the digitalisation of teaching, learning, and research practices. It had evidently enrolled postgraduate students with diverse needs in terms of digital knowledge and skills. Some students came from other universities that did not strictly implement digital technologies; others were older and did not know where to begin with digital technologies for research purposes. It is well acknowledged that the student population in higher education is

diverse, and student preparedness is a concern throughout various institutions (Khoza & Manik, 2016).

For my master's study, I observed that for the coursework master's programme, the intake was primarily made of older students who mostly had been teaching for years and were not familiar with using digital technology (digital immigrants). There were no programmes or modules organised for such students to help them understand the use of digital technologies. This unawareness resulted in two of my classmates who were older students deregistering the course in order to go for an external computer literacy programme before enrolling again for the master's study. Other times, I would spend hours at the research commons helping other master's students save their work, log in and use relevant search engines. For these reasons, I observed that there is a lot that still needs to be done by the students (individual preparation) and by the institutions of higher education to plan, prepare and accommodate all their students. This planning involves helping students adjust to the use of digital technologies by drawing the strengths of both professional and socialisation experiences to address their individual experiences and needs. This is significant because the 4IR provides a fundamental shift in paradigm in using digital technologies in various practices to promote combined professional and socialisation experiences (Lasi, Fettke, Kemper, Feld, & Hoffmann, 2014). More so, it is important to note that digital technologies are becoming more and more prominent and used vastly as educational transformation occurs in higher education. It is also within the context of digital technology innovation that higher education expanded its teaching and learning pedagogies and research practices to computers and internet facilities (Budden, 2013). Moreover, the COVID-19 pandemic has also forced research students to entirely conduct their studies using digitalised methodologies to avoid physical contact with human participants (Sokhulu, 2020).

1.4 Problem statement

Mdunge (2005) and Dlamini (2018) posit that some teachers in schools still have a problem using digital technologies. These findings suggest that teachers have challenges using digital technologies such as computers which would benefit their teaching experiences. Teachers' lack of digital knowledge and skill is a concern because the Master's in Education (M.Ed.)

programme usually enrolls students who are also school teachers. If their experience of using digital technologies is discovered to be problematic, they may experience similar issues when using the same digital technologies for research purposes, as evidenced in Khoza and Manik's (2015) study.

Khoza's (2009) study aimed at exploring the design analysis of educational technologists using Web-based teaching and learning environments in an institute of higher learning. The findings stipulated that the development of educational technology in the South African educational system may influence specialisations to compete internationally in their fields. This present study hopes to address the planning and development of digital technologies in higher education. It is also with the hope that the findings of this study can be transferable to experiences of similar contexts.

In addition, over the years, a number of studies have explored issues regarding digital technology experiences (Aitokhuehi & Ojogho, 2014; Dincer, 2016; Duke, 2011; Konan, 2010; Kozina, Dukić, & Dukić, 2012; Kpai, Joe-Kinane, & Ekeleme, 2012; Newhouse, 1987; Pennings, 2001; Ranasinghe, Wickramasinghe, Pieris, Karunathilake, & Constantine, 2012; Robabi & Arbabisarjou, 2015). These studies all used the quantitative approach to conduct their research. The phenomenon they all explore is the 'use' of digital technologies. However, the phenomenon explored in this study is the 'experiences' of master's students using digital technologies in research. Moreover, this study explores beyond the use of digital technologies, thus, tapping deeper into the rationale (why students used digital technologies in particular ways), feelings, and thoughts that master's students experience when using digital technologies in research. This study is also different in that it uses the qualitative approach, which is more in-depth. Therefore, it provides a detailed understanding of master's students' experiences of using digital technology in research.

Also, it is very common for studies on digital technology experiences to be conducted on undergraduate students (gap mainly identified with undergraduate students), ignoring that postgraduate students may also have complex experiences with the use of digital technologies in research. For example, Robabi and Arbabisarjou (2015); Ogundele and Etejere (2013)

studies were conducted with undergraduate student participants. The researchers investigated student experiences of using digital technology in learning specific modules. This study is different in that it worked with postgraduate students (master's students) to reveal their experience and the realities of using digital technologies to conduct their research studies.

1.5 Significance of the Study

There is a wide and global challenge with implementing digital technologies in higher education practices in various countries, such as Norway, Sweden, and South Africa (Ottestad, 2013; Salavati, 2016). Therefore, there is a propelling need to explore students' experiences of using digital technologies in their learning and research practices. This study specifically explores master's students' experiences with digital technologies used in research. Underwood (2009) also highlights that the effective use of digital technologies in higher education can be achieved through reflecting on students' complex experiences with digital technologies. This revelation can help in discovering relevant ways of addressing challenges identified in students' experiences. Similarly, valuable practices that help students use digital technologies more efficiently can be maintained and perpetuated.

Through the exploration of master's students' experiences, the most effective ways of using digital technologies may also be revealed. Additionally, based on studies such as (Amory, 2014; Czerniewicz & Brown, 2014; Budden, 2017), it is noted that digital technologies are used to formally address professionalisation or discipline needs; and to informally communicate or socialise with friends to address socialisation experiences. What is missing is a neutral platform of experiences that integrates the two experiences in addressing personal needs or helping individuals to self-actualise. In essence, master's students and other postgraduate students may benefit from this study – it may provide them with ways of creating a neutral combination of socialisation and professionalisation experiences to address their individual research needs.

After exploring undergraduate students' experiences of using digitally facilitated feedback, Anyanwu (2014) suggests that future research should further explore other components of digital technologies for university students. Similarly, Budden (2017) recommends that there

be further research exploring the use of digital technologies. Such would further expand on the existing body of knowledge, and provide greater awareness. Additionally, both Anyanwu's (2014) and Budden's (2017) studies were conducted in KwaZulu-Natal, South Africa. Their recommendations thus fuelled me further to explore the experiences of master's students in using digital technologies in research. In line with Anyanwu, 2014, and Budden, 2017, this study provides more awareness to various stakeholders in higher education on the use of digital technologies. Also, this study adds to the existing body of knowledge regarding digital technology implementation in higher education research practices. The study findings and recommendations may assist in addressing issues associated with the use of digital technology in higher education. Khoza and Manik (2015) also suggested that there should be future planning for postgraduate studies in higher education in South Africa. I believe that there should be more research into phenomena such as experiences with digital technology. This can aid in planning for future postgraduate studies. Findings and recommendations of this study may be helpful in the planning and evaluation of digital technology practices in research.

1.6 Purpose of the Study

The purpose of this study was to explore master's students' experiences of using digital technologies in research. The focus was on master's students who were at various stages of their research projects. These students provided varying perspectives and experiences of how and why they used specific digital technologies in their studies.

1.7 Location of the Study

This qualitative case study was located in an institution of higher education in the Durban area of KwaZulu-Natal province. The institution was given the pseudonym Tempo University to adhere to ethical considerations. Tempo University was selected because it is an institution where the targeted master's students were studying; hence it was easier to access targeted participants. Also, at this institution, it was easier for me as a researcher to use available resources for the study found within the school. Tempo University is well equipped with resources, technologies, facilities and Internet access adequate to help with data collection and analysis.

Tempo University has various faculties and schools within these faculties. This study was based in the Humanities Faculty, School of Education (SOE). This faculty offers studies and in-service training for teacher education programmes. In-service training, as discussed by Conco (2004), refers to the training or development that allows employees to expand their knowledge in various ways, including engaging in recent research. Thus, higher degrees in a wide range of specialisations, such as Bachelor of Education (B.Ed.), Bachelor of Education Honours (B.Ed. Hons), Master's in Education (M.Ed.) and Doctor of Philosophy (PhD) in Education are offered at this particular university. The institution has well-developed facilities suitable for all levels of study to use. Various conferences, cohorts and seminars for higher education and postgraduate studies are held, where the researcher may approach potential participants. Tempo University has the responsibility to respond to inequality and injustice, and address the imbalances of the past by teaching, community engagement, and further learning. The institution consists of students of different races, which portrays the South African rainbow nation. These races include Africans, Whites, Coloureds and Indians.

1.8 Research Objectives and Questions

1.8.1 Research objectives

- (1) To explore master's students' experiences of using digital technologies
- (2) To explore how master's students apply their experiences of using digital technologies in research
- (3) To understand why master's students experience digital technologies in particular ways

1.8.2 Research questions

- (1) What are master's students' experiences of using digital technologies? (descriptive)
- (2) How do master's students apply their experiences of using digital technologies in research? (operational)
- (3) Why do master's students experience digital technologies in particular ways? (philosophical/theoretical)

1.9 Study Research Methodology

1.9.1 Research paradigm

This study adopted the pragmatic paradigm. Alise and Teddlie (2010) discuss that the pragmatic paradigm considers multiple approaches in conducting a particular study. This pragmatic orientation also suggests that a researcher is free to employ methodologies from any approach to answer their study's critical research questions (Chaputula, 2016; Teddlie & Tashakkori, 2009). In other words, a pragmatic paradigm offers a philosophical perspective that allows research not to be limited to a specific approach. For these reasons, the pragmatic paradigm enabled me to select effective methods in attaining the study's objectives and answering the key research questions. As a result, I used reflective journals, semi-structured interviews, focus-group discussions, and digital observations to generate data. I also had the flexibility to change or add any other qualitative or quantitative method to meet my study needs. Moreover, master's students of different age groups were considered in this study. The digital technologies they used varied across their experience. Such were factors that could potentially produce quantitative findings. Through this awareness, I needed to operate under a paradigm that was not limiting to either the qualitative or quantitative approach. The pragmatic paradigm was most suitable for this study.

1.9.2 Research approach

This case study employed the qualitative approach as a dominating methodological approach since the methods used to generate data stemmed from such. This approach also aligned with the study objectives. Objectives were mainly to explore and understand master's students' experiences of using digital technologies in research. Creswell and Creswell (2017) explain that the qualitative approach is suitable for studies that aim to describe, interpret and produce meaning from participants' experiences. Similarly, this study used the qualitative approach to generate detailed findings, which I interpreted and analysed to provide deep meaning and understanding about participants' experiences. Providing a descriptive analysis allows researchers to tell stories about participants' realities in words, thus focusing on detailed narratives of their personal worlds (Sutton & Austin, 2015). As a result, this present study predominantly operated under the qualitative approach. The study aimed to provide textual, descriptive, and theoretical findings about master's students' unique experiences with using digital technologies in research.

1.9.3 Selection of participants

Martínez-Mesa, González-Chica, Duquia, Bonamigo, and Bastos (2016) explain that the selection of participants refers to identifying suitable individuals with interest in responding to the key research questions, as participants in a study. Thus, researchers have to find meaningful ways of selecting participants who are willing to share their experiences (Marshall, 1996). In this study, I used purposive and snowball sampling to select fourteen master's students to be part of the present research. Purposive sampling was used to obtain the first ten participants in the study, which were chosen across research disciplines offered at Tempo University. The remaining four participants were accessed through snowball sampling. Some of the existing participants recommended other master's students whom they thought could be interested in being part of the study. Through the two sampling methods, I was able to recruit fourteen participants as part of the study.

1.9.4 Data-generation methods

This study employed reflective journals, semi-structured interviews, focus-group discussions, and digital observations as data-generation methods which answered the key research questions. Bashan and Holsblat (2017) indicate that reflective journals can be used by participants to reflect on their experiences, by writing them down in a journal. In this study, reflective journals were used at the initial stage of data generation: participants were given the opportunity to document their experiences of using digital technologies in research. Semi-structured interviews were used to find out more from the participants about their experiences, probing them further on what they indicated in their reflective journals. This method was also used to gather rich and in-depth data from participants. In a semi-structured interview, a researcher engages in a dialogue with participants by asking them open-ended questions; participants respond without having any limitations imposed (Cohen et al., 2007). So, all fourteen participants were interviewed individually by myself as a researcher, to generate detailed findings.

Furthermore, only ten participants were still willing to participate in the focus group discussions. I separated the focus-group discussions into two groups, each with five participants. Through focus group discussions, participants are granted the opportunity to share

their experiences collectively; and also to engage with the researcher (Gill, Stewart, Treasure, and Chadwick, 2008). Likewise, in this study, focus group discussions enabled participants to share their experiences. I was thus provided with another opportunity of probing them further on their experiences with using specific digital technologies. As the final research method employed in this study, digital observations were used to provide readers with visual representations of some of the software digital technologies used by participants in this study. In addition, digital observations were used to capture participants' engagements with digital technologies through their social-media platforms.

1.9.5 Trustworthiness and authenticity

The trustworthiness and authenticity of a study is measured through credibility, dependability, transferability, and confirmability in qualitative research.

1.9.5.1 Credibility

Guba (1981) postulates that research credibility refers to the honesty of findings presented in a study, thus reflecting true and original views of the participants. Also, Merriam (1998) adds that credibility asserts the reflecting of truth about participants' realities. Thus, to ensure credibility in the findings of this study, I recorded and transcribed the interview and focus-group discussions which I later returned to all participants for verification. The verification related to participants indicated whether the transcription reflected their realities.

1.9.5.2 Dependability

Dependability refers to the use of overlapping methods to generate data in a study; these methods can include focus group discussions and interviews in qualitative research (Lincoln & Guba, 1985). In other words, dependability involves providing detailed descriptions about the research methods used in the study, in such a way that other researchers can conduct another study using similar methods (Shenton, 2004). Therefore, to adhere to dependability, I used four data-generation methods to produce data on participants' experiences of using digital technologies in research. Moreover, I provided in detail how each method was used to suit the needs of this study, and attend to the objectives. The four methods used in this study include reflective journals, semi-structured interviews, focus group discussions, and digital observations.

1.9.5.3 Transferability

Golafshani (2003) states that transferability relates to the extent to which findings of one study can be transferable to a similar phenomenon discussed in another study. To ensure transferability, Anney (2014) and Shenton (2004) stipulate that researchers need to define and discuss their phenomena and findings clearly and descriptively, so that readers are able to compare and transfer the findings to their own realities. This study provides detailed discussions about the phenomenon in Chapter Two, presenting in-depth findings with relevant interpretation to make sense of the data. These detailed discussions give readers the opportunity of evaluating the findings in relation to their own context of using digital technologies.

1.9.5.4 Confirmability

Shenton (2004) asserts that confirmability relates to ensuring that findings are not simply fabricated by the researcher. This confirmation can occur in many ways. For example, in this study, confirmation of findings occurred by returning transcripts to participants to confirm their correct representation. Also, confirmation ensured that findings were not of the researcher's imagination: academic supervisors repeatedly read the findings presented in the dissertation, critiquing the work constructively. As Anney (2014) indicated, other researchers must confirm the feasibility of findings presented in any particular study.

1.10 Ethical Considerations

Sales and Folkman (2000) posit that ethical considerations refer to adhering to ethical conducting of a research study. Such may involve considering informed consent, ethical approval, and confidentiality. In this study, in February 2020, full ethical approval was granted by Tempo University (Appendix F). Furthermore, informed consent was sought from participants through consent letters which they signed in agreeing to be part of the study. These letters indicated the study objectives and also informed participants of their right to withdraw at any time during the study if they wished to do so (Appendix E). To ensure anonymity, both the university and the participants were provided with pseudonyms in order to protect their identity and maintain confidentiality.

1.11. Overview of the Study

1.11.1 Chapter One: Introduction and background of the study

The first chapter introduces the study and provided background information for the reader to understand what the study is about. The chapter further outlines the rationale, focus and significance of the study. This chapter further reveals the need for the study to be conducted. Moreover, the methodology is discussed to map out how the study was conducted; and a brief overview is provided indicating how the full doctoral dissertation proceeds, according to each chapter.

1.11.2 Chapter Two: Literature review part one – the phenomenon of the study

This chapter forms the first part of the literature review, that theorises on the concept of experiences related to the use of digital technologies. In this chapter, I review various scholarly works to obtain what has already been studied about the experiences of using digital technologies in universities, particularly regarding students' experiences. Through thorough engagement with literature, I show how students used digital technologies to attend to their social, professional, and personal experiences. To theorise on these experiences (the phenomenon), throughout the chapter, I conceptualise them as *socialisation*, *professionalisation* and *personalisation* experiences, to meet the needs of this study. The chapter further defines each experience and provides evidence from the literature on how students use digital technologies to attend to their socialisation, professionalisation, or personalisation needs. The chapter also discusses the various types of digital technologies used in research, such as hardware and software resources. It also elaborates on ideological-ware, which can guide students in understanding how to use digital technologies in their studies. Also, various stakeholders' roles and contributions in using digital technologies are reviewed.

1.11.3 Chapter Three: Literature review Part Two – what constitutes master's research in the 4IR

This chapter forms the second part of the literature review to outline the structure of a master's (M.Ed.) dissertation. This exploration includes reviewing the various sections found in a research project. It also indicates which digital technologies can be used in order to engage with these sections. This discussion begins with exploring a master's research study title to

providing a study's recommendations and conclusion. The chapter also provides a detailed discussion on what it means to be a master's researcher in the transition to the 4IR. This discussion reveals the kind of digital technologies that master's students use when conducting their studies in the 4IR era. The discussion further highlights some of the research activities conducted through the use of digital technologies.

1.11.4 Chapter Four: Theoretical framing of the study

Chapter Four presents the theoretical, conceptual and analytical framing of the study. The chapter begins by reviewing and thoroughly engaging with the Cultural Historical Activity Theory (CHAT) as a theoretical framework used to generate the new analytical framework of this study. To explore the CHAT theory, I discussed the theory's background, the ideology of activity theory, the Zone of Proximal Development (ZPD). Finally, I engaged with the six components of the CHAT theory in relation to the study to develop a contextual understanding. The chapter also discusses the Unified Theory of Acceptance and Use of Technology (UTAUT) conceptual framework. The UTAUT framework was used to contribute to the final analytical framework produced in this study. Similar to the discussion on CHAT, the background of UTAUT was revealed. Moreover, four constructs were discussed in relation to how they shape users' beliefs and acceptance of digital technologies into their practices. To finalise the chapter, specific concepts from CHAT and UTAUT were deployed to propose a new analytical framework to interact with the study findings in Chapter Eight.

1.11.5 Chapter Five: Methodology used in the study

This chapter presents the methodology employed to conduct this study. This case study was located within the pragmatic paradigm; took on the qualitative approach to conduct research. Methods used to conduct this study include reflective journals, semi-structured interviews, focus-group discussions, and digital observations. Each of these methods were discussed in detail, providing their strengths and limitations as well as their suitability for the study. This chapter also discusses how the fourteen participants were selected for the study using purposive and snowball sampling. Furthermore, the chapter expanded on the discussion to indicate how data was analysed in the study using thematic (Chapters Six and Seven) and deductive analysis (using the analytical framework, Chapter Eight). The chapter also describes ethical procedures

followed in the study to ensure ethical conduct throughout the research process. Lastly, authenticity and trustworthiness were discussed along the concepts of transferability, dependability, credibility and confirmability.

1.11.6 Chapter Six: Data presentation and analysis, part one

In this chapter, the readers are provided with findings of the study according to descriptive analysis presented under two broad themes. This data presentation forms part one of the descriptive analysis offered in this study. Moreover, the broad theme one contained three sub-themes that expanded on participants' positive experiences of using digital technologies in research. The Broad theme two is made up of four sub-themes which explore the interpretation of students' negative experiences with digital technologies. Data from reflective journals, semi-structured interviews, focus group discussions and digital observations were deployed for this part one analysis.

1.11.7 Chapter seven: data presentation and analysis, part two

This chapter presents the second part of the descriptive analysis which is offered according to three broad themes. Each broad theme presented in this chapter comprises two sub-themes that expand on participants' experiences, but particularly focusing on why they experience digital technologies in particular ways. Data used in this chapter are also taken from reflective journals, semi-structured interviews, focus-group discussions, and digital observations.

1.11.8 Chapter eight: theorising findings, propositions, and conclusion

Chapter eight of this doctoral dissertation theorises and concludes on the study findings according to the concepts proposed by the Persona-Tech analytical framework. The chapter presents five propositions argued to provide quality personalisation experience for master's students who use digital technologies to conduct their studies. The chapter further provides a summary of findings according to the study objectives and critical questions. To finalise the chapter, relevant implications are indicated for students and further research. In addition, concluding remarks are made based on the whole study findings.

1.12 Conclusion

This chapter introduced the study by providing the background on exploring master's students' experiences of using digital technologies in research. It also outlined the rationale for the study, the problem statement, the significance of the study, and a brief overview of the proceeding of the study according to the eight chapters. This outline of the study chapters included the discussions on the methodologies employed, the theoretical framing, the literature review, and overview of the findings presented in this study. The following chapter critically discusses the phenomenon of the study by drawing deeply from literature, to review previous findings on students' experiences of using digital technologies for their studies.

CHAPTER TWO

THEORISING EXPERIENCES OF USING DIGITAL TECHNOLOGIES

2.1 Introduction

The previous chapter presented the background of the study, thus outlining the purpose of exploring master's students' experiences of using digital technologies, research objectives and questions, location of the study, the problem statement, and a brief overview of the study. This chapter reviews literature across international and local levels using constructs. According to Shunda (2007), a literature review is an overview of major research conducted on a particular topic that serves as motivation for one's research. Hart (2018) adds that a literature review explains and critically analyses other scholars' ideas regarding one's research topic. Such is important because it helps to develop an understanding of a topic, indicating what has been done, and what has not. In other words, a literature review is essential in indicating existing research and gaps on a topic of study. In this study, a literature review produced an understanding of the experiences (phenomenon) of students' use of digital technologies. Furthermore, this chapter identifies loopholes that this study wishes to address, underlining its significance.

This chapter critically discusses the experiences of using digital technologies, drawing from various studies found in the literature. The review also employs the construct structure which is divided into concepts, discussed accordingly in each section of the review (conceptual structure). Thus, George (2015) outlined a construct literature review structure as a way of writing that allows a researcher to select relevant constructs, themes, or concepts to organise the review. The following constructs are found in the literature below: theorising experiences (phenomenon), used digital technologies (resources), digital technologies of research, and stakeholders' involvement and contributions of using digital technologies. Figure 2.1 below indicates the structure and details of the literature review.

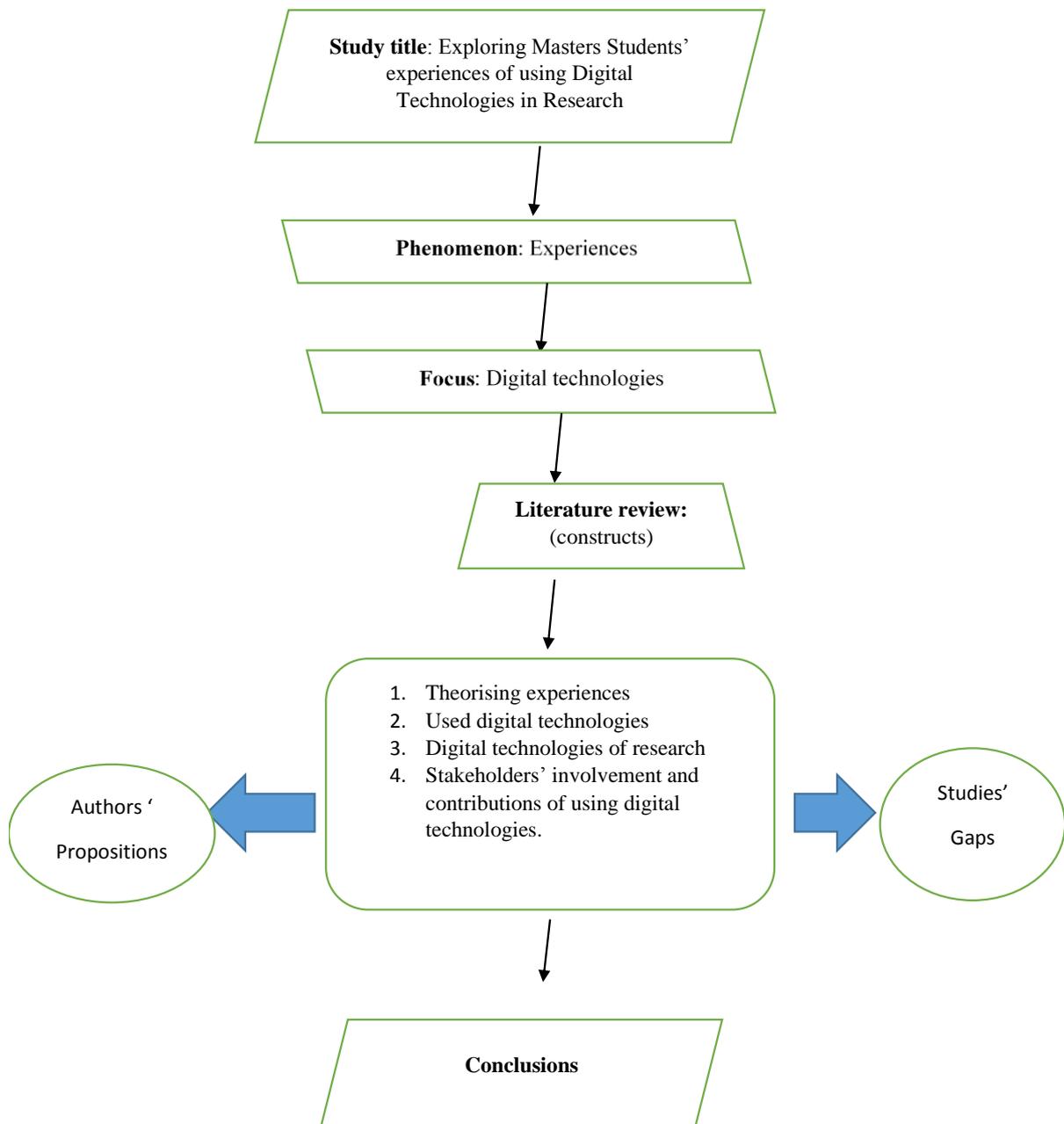


Figure 2.1: A flow chart indicating the structure of chapter two

2.2 Theorising experience (phenomenon)

The concept of experience is one of the commonly used and recognised concepts in education which refers to being involved in activities or events that profoundly mould one (Wolff-Michael & Alfredo, 2014). In other words, experience means participating in social and professional events that one encounters throughout their lifetime. Hohn (2013) and Dewey (2005) assert that experience is based on the interaction between humans and the world they live in. The researchers mentioned above extend the argument by stating that experience is the holistic existence of a human being, based on historical, communicative, and cultural phenomena. Additionally, Dewey (2005) acknowledges that experience involves constant engagement in movements, histories, cultures, and situations.

Dewey (1986), a well-known educational philosopher and theorist of the 20th century, discussed the concept of experience as allowing one to have skills and direction. Dewey elaborated that experiences are an exciting part of human existence. The acquisition of skills and direction may be based on past activities and behaviours, or previously identified routines (Bruneel, Yli-Renko, & Clarysse, 2010). Moreover, Glassman (2001) advocates that experience is one of the most important aspects of the human community, as it helps with thinking through situations. This discussion suggests that experience constitutes various aspects, such as behaviour, skill, existence, history, culture, and situations that holistically impact one's being. Experience is thus based on social (informal) and/or professional (formal) actions that produce personal (non-formal) experiences reflecting one's identity (Mpungose, 2018).

Dewey's ideology of experience was based on two mechanisms: *interaction* and *continuity* (Vasile, 2016). Thus, interaction elaborates on how past experiences interact with the present circumstances to make up current experiences (Dewey, 1938). Furthermore, continuity elaborates on how previous experiences inform present experiences; and how present experiences will influence future experiences in a personal way (Dewey, 1938). Essentially, Dewey views the experience as an overlapping phenomenon that is embedded in situations, activities, and behaviours. Thus, Dewey's idea of experience suggests a continuation of

interaction between people and their environment that makes up a person's integrated experience, forming their unique identity.

Moreover, Dewey's conceptualisation of experience is supported by that of Khoza (2018), Maxwell (2013) and Schon (2017), who indicate that for people to become aware of their identities, they must reflect on their strengths and weaknesses. Thus, people must reflect on (the past), in (the present) and/or for (the future) in order to understand their experiences and identities (Maxwell, 2013). For example, if students intend to understand their digital technology identities, they will need a space in which they will be able to reflect on their professional and social experiences. This suggests the importance of reflective activities to be employed in any usage of digital technology. The essence of reflective activities in understanding digital users' experiences is evident in a study conducted by Khoza (2017a). Khoza's (2017a) study explored the use of Skype in conducting research. The study concluded that when digital technology users reflect on their experiences, they become aware of their needs; and thus, they use digital technologies to address their particular needs. These findings suggest that digital technology users generate sufficient power to capture and control digital technologies according to their categories of needs, driven by professional and/or social experiences.

Costa, Murphy, Pereira, and Taylor (2018) conducted a study on students' experiences of learning to use digital technologies at one particular university in the United Kingdom. In addition, Kennedy, Judd, Churchward, Gray, and Krause (2008) explored the experiences of first-year students in using technology to indicate their digital nativity in a particular university in Australia. Even though the two studies above explored different topics apropos of digital technology use, their phenomenon was participants' experiences. Hence, the participants had to reflect and account for their past and current events regarding their experiences.

There has been several other studies conducted on the use of digital technologies. For example, studies (Budden, 2017; Khoza & Manik, 2015) have explored the use of digital technologies by master's students in South Africa. However, both studies adopted other phenomena and their studies' focus. Therefore, these studies point out a dearth of studies exploring master's students' experiences of using digital technology in research.

In the literature, the use of digital technologies is found to promote various experiences, such as professional, social and personal experiences (Czerniewicz & Brown, 2014; Khoza, 2015; Khoza, 2017a; Khoza*, 2013; Mpungose, 2018). However, these studies have concluded by limiting these experiences to static systems (professional, social, and personal), indicating an endpoint in the experiences of digital usage. For example, a student may use digital technology such as Skype either professionally or socially. Later, however, the student may have to learn the use of a new digital technology that replaces Skype, should Skype become outdated (Khoza, 2017b). Therefore, it is worth noting that digital technologies are frequently changing; thus, users must be informed of the new technologies and their systems to adapt accordingly (Dlamini, 2015). This present study explores these experiences as processes (professionalisation, socialisation, and personalisation). Thus, considering emerging digital technologies brought about by technological innovation. Below is a discussion on experiences (professionalisation, socialisation, and personalisation) that promote the use of digital technologies. Such processes accommodate any newly introduced digital technology even if they come as systems.

2.2.1 Professional (professionalisation) experience

2.2.1.1 Professionalisation experience conceptualised

According to Dlamini (2018) it is important for people to bring to attention the significance of professionalisation, socialisation and personalisation experiences when considering the use of digital technologies in any sphere of work. Thus, studies (Amory, 2014; Czerniewicz & Brown, 2014; Khoza, 2017a) stipulate that the professionalisation experience refers to the use of digital technologies for formal learning and research. In other words, the professionalisation experience involves learning that forces one to follow specific instructions to meet discipline needs (Khoza, 2015b). Studies by Singhal and Rogers (2012) and Underwood (2009) further indicate that the use of digital technologies in any formal learning is usually driven by professionalisation experiences whereby instructions and rules must be followed. Therefore, using digital technologies for formal learning may produce rules for all users to follow (Underwood, 2009). Budden (2017) also emphasises that the use of digital technologies has greatly affected higher education practices by digitalising teaching, learning and research activities for academics, and both undergraduate and postgraduate students (a

professionalisation experience). The use of digital technologies for the professionalisation experience, particularly in postgraduate studies, is also found in Khoza's (2017b) research study. Khoza's study revealed that the use of digital technologies for the professionalisation experience has resulted in academic content being published on software platforms such as Moodle, which students can utilise for their research projects. Digital technologies thus allow for professional relationships to form between academics and students. Such parties can communicate regarding academic matters using digital platforms such as Moodle and emails (Czerniewicz, Ravjee, & Mlitwa, 2004). The section below discusses academics' and students' experiences of using Moodle for professional teaching and learning.

2.2.1.2 The use of Moodle for professionalisation experience

Digital technologies are becoming more integrated into many spheres of human life. Thus universities have begun using hardware and software resources that aid in digitalised teaching, learning, and research practices. As such, digital Learning Management Systems (LMSs) such as Moodle have been developed to convey academic instruction and to support students' learning (Stasinakis & Kalogiannakis, 2015). Furthermore, Moodle allows users to create and manage tasks, and communicate through relevant channels such as the discussion forums and chats (Carolina Costa, Alvelos, & Teixeira, 2012).

Thus, many studies have indicated that students and academics can use digital technologies such as Moodle to address professional needs. For example, Khoza (2017a) conducted a study exploring Moodle as a professionalisation space for students to reflect on their studies. Similarly, Mpungose (2018) conducted a study exploring lecturers' reflections on using Moodle to teach a physical science module. Their studies found that Moodle was used as a professionalisation space by both students and lecturers to indicate (lecturers) and follow (students) specific instructions. This access to academic content further allowed students to meet discipline objectives. According to a survey study conducted by Chung and Ackerman (2015) in the United States, students found Moodle useful in communicating with their lecturers and fellow students on study module contents. Findings also indicated that students enjoyed the use of Moodle as it provided them with the flexibility and control over their educational progress and academic activities within their convenient spaces (home or school). Therefore, it can be argued that this use of digital technologies for the professionalisation

experience is triggered by the belief that digital software such as Moodle supports learning and research activities (Bates, 2015; Ngubane-Mokiwa & Khoza, 2016; Wankel, 2011).

2.2.1.3 The use of Turnitin for professionalisation experience

Turnitin is a software created by John Barrie in 1997 to detect plagiarism and similarity contents presented by students and academics to promote originality and appropriate acknowledgement of sources used in academic work (assignments, articles, dissertations). The literature reviewed (Khoza 2015; Zuma, 2020) on the use of Turnitin for the professionalisation experience shows that teachers and lecturers use Turnitin to assess and identify students' plagiarism. For instance, using semi-structured interviews and reflective activities, Khoza (2015) found that teachers used Turnitin (digital software) to identify plagiarism from learners' work. However, the findings also indicated that, as a professional practice, Turnitin did not help teachers fully to prevent learners from plagiarising. Learners could still commit plagiarism despite the application of plagiarism detecting software.

Similarly, in a study exploring mathematics lecturers' understanding of Turnitin, Zuma (2020) found that lecturers indicated that some students could manipulate Turnitin. Lecturers added that Turnitin could not detect mathematics content such as the graphs, terminology, and numbers, because the software cannot translate such. These findings suggest that, even though digital technologies are used for formal teaching and learning, they are not always helpful or utilised according to the required rules. This creates a gap for technological innovation to occur in order to become advanced in minimising issues such as plagiarism practices. In this instance, Turnitin requires, updating or a new software could be developed to replace it. This process indicates the infinite innovation of digital technologies that users have to adapt to.

From another perspective, Turnitin has been found to be effective in decreasing plagiarism within some academic institutions. Batane (2010) explored the effectiveness of Turnitin in reducing plagiarism in students of Botswana University. Using mixed methods followed by the pre-test and post-test approach, Batane found that during the pre-test, when students' assignments were submitted on Turnitin without their knowledge, the average level of plagiarism was 20.5%. However, during post-test when Turnitin was introduced to students, the average plagiarism level decreased to 4.3%. On a similar note, an earlier study by Graham-Matheson and Starr (2013) pointed out from their interview analysis, that students

acknowledged that the use of Turnitin helped them plagiarise less, improving citations and excelling in academic writing. In this study by Graham-Matheson and Starr (2013), a significant reduction in plagiarism from students was achieved through constant training and support (from tutors) on how to use the software; and how to write academically by acknowledging all sources. Many other studies, including those of Ledwith and Rasquez (2008), Rogerson and Scott (2010), also wrote on the reduced plagiarism noted in students' work. The reduce in plagiarism was evident after the introduction of Turnitin into academic practices, together with relevant support provided by academic staff. Therefore, as a professionalisation experience, formal support and training are needed for some software (such as Turnitin) to be used efficiently. When exploring the use of digital technologies, it is also essential to consider the users' abilities, competence, and other factors that shape their experience with digital technologies. The section below discusses digital technology users' identities according to specific categories depending on their competence, age, and abilities.

2.2.1.4 Digital technology user identities in relation to the professionalisation experience

Digital technology users can be identified and positioned into specific categories according to their age and competence in using various digital resources. In a quantitative study, Prensky (2001) discovered that people born at a time when digital technologies are prominent enjoy their use; thus, they can be categorised as digital natives. Prensky (2001) also stipulated that those individuals born prior to the digital period can be referred to as digital immigrants. Essentially, Prensky (2001) elaborated on two concepts among many others (digital savvy, Net generation, millennials, digital stranger, Google generation) that assist in categorising people who use digital technologies according to differing abilities and generational segregation. As a result, the establishment of the term digital natives has gained popularity in many areas, including education and for Information System (IS) practices (Helsper & Eynon, 2010). Palfrey and Gasser (2011) further assert that digital natives are those born after 1982, when digital technologies were easily accessible and in common use. Thus, in his study on Digital natives and Digital immigrants, Prensky (2001) concluded that young people (digital natives) think and process information faster using digital technologies than digital immigrants having been born during the digital age. Bennett, Maton, and Kervin (2008), Palfrey and Gasser (2011) supported Prensky's (2001) findings by asserting that digital natives are experts in using digital technologies. The researchers go as far as calling them 'native speakers of the digital language'.

Contrary to the experiences of digital natives, Prensky (2001) argues that digital immigrants do not see the need to use digital technologies for learning and research, being unable to understand the use of the new digital technologies. Palfrey and Gasser (2011) further concur that digital immigrants prefer manual writing and printing instead of working digitally on a computer. As a result of the difference between digital natives and digital immigrants, Straus and Howe (1991), Chigona, Chigona, Kausa, and Kayongo (2010) discuss age as a contributing factor to how people use digital technologies. Thus, the use of digital technologies is found more attractive by digital natives (the young generation) than by digital immigrants (the older generation) (Straus & Howe, 1991). Findings from Khoza (2011) study on Web-based teaching in South African universities supported the above arguments. The study revealed that older lecturers were uncomfortable with the advancement of digital technologies in their respective universities.

Working on the premise of using digital technologies for the professionalisation experience, Budden's (2017) qualitative case study revealed that all four master's students involved in the study used digital technologies effectively to produce their research dissertations, despite all being digital immigrants. In other words, the students were forced to use digital technologies for their studies to meet their professional study needs, although they were identified as digital immigrants. Nonetheless, contrary to the common experience of digital immigrants, these master's students' experiences did not reflect as unsatisfactory when using digital technologies for a professionalisation experience. Also, from the findings, it can be suggested that not all digital immigrants find it difficult to use digital technologies to conduct their research.

Khoza and Manik (2015) acknowledged another factor that shapes users' experience with digital technology. They posit that postgraduate students often range across different age groups (the early 20s – late 40s) and come from diverse backgrounds. Above all, more than anything, the context also determines a person's ability to use digital technologies. As a result, a few lecturers from Khoza's (2011) study attested that they enjoyed using the newly introduced digital technologies. Their backgrounds and contexts included computer knowledge, skills, and experiences. Therefore, it can be argued that the context factor is often ignored in studies because of the focus on the generational gap between digital immigrants and

digital natives. From the above discussions, it is understood that digital technologies are used widely for formal activities, thus promoting professionalisation experiences. It is also evident that users have varying experiences with these digital technologies depending on various factors elaborated above. Therefore it is, essential to explore experiences of using digital technologies for professionalisation experience in educational and research internal contexts. The following section provides a detailed review of literature on further experiences of using digital technologies for professional teaching, learning, and research, from a global perspective.

2.2.1.5 The utilisation of digital technologies for professionalisation experience: A detailed global perspective

Adnan, Kalelioglu, and Gulbahar (2017) stipulate that digital technologies influence the way in which teaching, learning and research occur in higher education. To affirm this notion, a study conducted in Taiwan by Lin, Chen, and Liu (2017) employing survey research, revealed that using digital technologies such as the Internet and cellphones for learning presents a greater positive effect on these experiences than traditional learning does. This study was conducted with undergraduate university students. It was further indicated that experiences of using digital technology showed a positive influence on module outcomes. Another study conducted in Belgium using case study methodology and focus groups indicated that the introduction of digital technologies such as hardware (computers and tablet devices) aided in media-rich, interactive, and exciting new learning experiences for students. The study also recommended that curriculum designers introduce pedagogical and technical support to facilitate learning, and to understand the use of digital technologies for students (Montrieux, Vanderlinde, Schellens, & De Marez, 2015). These recommendations are also supported in the studies of Graham-Matheson and Starr (2013), Ledwith and Rasquez (2008), and Rogerson and Scott (2010), respectively.

The above findings suggest that students' experiences with digital technologies in Belgium and Taiwan had some positive influence on their professionalisation practices. However, these studies have neglected the use of digital technologies for socialisation and personalisation experiences. This presents the need for a study to explore and identify whether there is a similar positive trend, or different experiences for master's students' research practices in South Africa. Moreover, this current study also considers the different experiences and influences

that shape how students conduct their research studies using digital technologies to inform their personalisation experiences.

Drawing from an African perspective based on a survey research in Nigeria, Michael and Igenewari (2018) indicate that the government of Nigeria has invested greatly in the integration of digital technologies into the education sector. The study used high school teachers as a sample. The findings indicated that teachers' digital knowledge and skills were low, which negatively affected computer literacy in the schools in which they taught. Similarly, Dlamini (2018) and Chigona et al. (2010) conducted studies which explore teachers' experiences of using digital technologies in South Africa. These studies revealed that, even though teachers have access to some digital technologies at home (for entertainment), these teachers struggled with and were uncomfortable using digital technologies for professionalisation experiences (teaching). The studies further indicated that this uncomfortable experience was due to teachers' lack of training on digital technology use for professionalisation. This low competence in using digital technologies is of concern because it is evident from the studies that poor competence has escalated over time, in various contexts. The teacher experiences projected in these studies are of concern. These could be teachers who may choose to enrol in a Master's in Education (M.Ed.) research programme at a university (for professional development). In such institutions, research studies are conducted with similar digital technologies that teachers struggle to use in schools.

In a previous study, Khoza (2009) depicted the need for digital teaching and learning to be formalised in the South African education system, thus promoting the professionalisation experience. To further elaborate on this digitalisation, Khoza (2011) noted that teaching and learning emerged into web-based platforms. This study used eight university Web-based Teaching and Learning (WBTL) facilitators from four South African universities as participants. The findings highlighted that effective Web-based teaching and learning was not evident. Facilitators indicated that their students found WBTL not 'student user friendly'. These findings imply that students were struggling to use digital technologies for formal learning. This calls for more studies to be conducted on the experiences of using digital technologies in education and research. Further studies will assist in understanding how and why students use digital technologies the way they do, drawing from their own realities. The

above study only reflects facilitators' understanding of how students perceive digital technologies such as Web-based online platforms.

Nonetheless, many studies have been conducted on the experiences of using digital technologies (Aitokhuehi & Ojogho, 2014; Amory, 2010, 2011, 2014; Asan, 2003; Bansilal, 2015; Cavus, Uzunboylu, & Ibrahim, 2007; Czerniewicz & Brown, 2014; Dlamini, 2018; Hardman, 2005a; Kennedy et al., 2008; Khoza, 2011; Kpai et al., 2012; Lin et al., 2017; Mdunge 2005; Michael & Igenewari, 2018; Mpungose, 2018; Tall, 2010; Yusuf, 2005). However, these studies are limited to teachers', undergraduate students', high school learners', and lecturers' experiences. These findings imply that there is a dearth of studies exploring postgraduate master's students' experiences of using digital technologies for research purposes. A study should be conducted specifically to reveal these experiences, thus providing detailed analysis and understanding.

Moreover, Adnan et al. (2017) explored online learning using tutors from multinational backgrounds. Their sample and the findings indicated that, without proper development, tutors found it difficult professionally to teach online modules. Seemingly, tutors were not ready to employ online teaching in their professional practices; hence they could not guide their students effectively using digital technologies. This study then recommended that future research should continuously explore professional practices of using digital technologies in higher education to help create efficient use of the evolving and newly introduced digital technologies. Therefore, by implication, more studies are needed to explore the experiences of using digital technologies in higher learning institutions. Such will add to the existing body of knowledge while advancing new theories that display effective ways of using digital technologies. Hence, the significance of this study. The present doctoral study aims to develop a new framework that may help guide research activities that involve the use of digital technologies. The above discussion has expanded more on the experiences of using digital technologies for professionalisation experiences drawing from literature. This poses a need to also discuss the use of digital technologies for socialisation and personalisation experiences. Such experiences are proposed initially in this study as part of the phenomenon being explored. The section below provides detailed discussions on the use of digital technologies for the socialisation experience, based on the reviewed literature.

2.2.2 Social (Socialisation) Experiences

2.2.2.1 Understanding socialisation experience when using digital technologies

It has been discussed that not only do people use digital technologies for professionalisation but also for socialisation. As a result of the socialisation experience, Brey (2004), argues that digital technologies and the social world can be described as deeply interwoven. Thus, social processes have a way of shaping ways in which people use digital technologies (Czerniewicz et al., 2004). In other words, a socialisation experience involves both informal and social learning that may transform societies and individuals (Khoza, 2016). Moreover, Khoza and Mpungose (2018) discuss that the use of digital technologies promotes socialisation experiences generated by an individual's social needs. In a similar way, Khoza (2017) and Mpungose (2018) refer to socialisation experiences as learning that takes place informally to address societal needs.

As a consequence of this experience, knowledge can be informally shared through digital technologies as a feature of modern societies (Fraillon & Ainley, 2010). Furthermore, the development of digital technologies has changed how people apply social communication (Kozma & Voogt, 2003). Hence, understanding the use of digital technologies in order to attend to social needs has become important for life in modern society (Fraillon & Ainley, 2013). For these reasons, Khoza (2012) and Amory (2014) argue that digital technologies allow students to socialise or learn informally, building socialisation experiences. Additionally, Amory (2014) postulates that digital technologies may positively impact students' learning by supporting their social learning abilities. This positive impact was evident in a study conducted by Pillay and Karlsson (2013), in which research students could use digital databases as a social space for collaboration, sharing articles and presenting useful theoretical frameworks for their studies. Thus, these findings imply that the creation of digital research data bases can enhance socialisation experiences of researchers who are working with digital technologies (Khoza, 2015).

2.2.2.2 Digital technology user identities in relation to the socialisation experience

It has been discussed that students and other digital technology users can be identified as digital immigrants or digital natives drawing from their digital abilities and generational grouping factors as postulated by Prensky (2001). Also, Prensky argued that digital natives are likely to

use digital technologies more efficiently than digital immigrants. Interestingly, however, Francis and Hardman (2018) note that digital natives have been found to be experts in using digital technologies for socialisation; however, they struggle to use them to address professionalisation experiences. In other words, what Francis and Hardman are arguing for is that being a digital native does not guarantee effective use of digital technology to inform professionalisation experiences, such as observed with the socialisation experience. To support these findings, a qualitative case study conducted by Czerniewicz and Brown (2014) aiming to explore the technological and habitus practices of South African university students indicated that students have varying experiences with using digital technologies for socialisation or professionalisation. On the one hand, the study's findings showed that one urban student (a digital native) was efficient in using his cell phone and laptop to log on to social networks and address his social experiences. However, he struggled to use the same digital technologies to attend to his professionalisation needs.

On the other hand, a student from a rural background (also a digital native) used digital technologies such as a laptop strictly for his studies to address his professionalisation experiences. With his experience of using digital technologies, particularly for professionalisation, it became easier for him to send emails and respond to matters relating to research assignments. Even though the discussion reveals student identities and experience with digital technology according to socialisation and professionalisation, the discussion also indicates their dissimilar background. Khoza (2011) argued that such dissimilarity has an impact on how students use digital technologies. The experience of the rural student highlights that not all students from rural contexts find the use of technology difficult, especially for the professionalisation experience.

2.2.2.3 The use of digital technologies to inform socialisation experiences in teaching, learning and research

Digital technologies can be used to address socialisation in teaching, learning, and research activities. This experience has been noted in a desktop study conducted by Czerniewicz et al. (2004), which stipulated that universities have employed the use of digital technologies to improve communication between lecturers and large undergraduate classes. Universities included in this study used their LMSs and other online platforms to create and sustain informal

dialogue between students and lecturers, thus forming social roles in teaching and learning. Similarly, Chung and Ackerman (2015) pronounce that digital technologies such as Moodle serve as a communication benefit for students to access and interact with their lecturers online. These findings are supported by Khoza (2015a) study which revealed that students used various digital technologies (chat room, discussion forum, Facebook, cell phones and laptops) to connect and communicate with their module facilitator in order to achieve the intended outcomes of their module. The findings from the above studies suggest that, even though lecturers and students' encounters are for educational purposes, the introduction of digital technologies has also enabled socialisation experiences to occur between the two stakeholders. This ensures effective academic collaboration. Khoza (2015a) additionally indicates that students used digital technologies for learning and research, whilst also enjoying them for entertainment activities and socialisation experiences. Thus, socialisation can occur with any group of people who use digital technologies to attend to their identified needs (Ngubane-Mokiwa & Khoza, 2016). In this instance, technology pertained to teaching and learning needs of students and lecturers respectively.

Furthermore, studies (Khoza, 2016, 2017a; Singhal & Rogers, 2012) also reveal that, even though digital technologies can be used for professional learning, they were originally designed for entertainment or a socialisation experience. Thus, Prensky (2001) argues that one of the best ways to teach students is to use computer games that involve informal learning methods (a socialisation experience). As a result of this suggestion, Amory (2010) conducted a study to explore how computer video games contributed to teaching and learning for teenage learners. The study findings reported that students understood content better when using digital technologies (digital games) by socially collaborating with each other. These findings suggest that the use of digital technology for learning promoted socialisation experiences.

Irvin (2007) stipulates that some people may prefer to use digital technologies for socialisation experiences. Khoza (2016a) adds that digital technologies are becoming more prominent in use during the transition to the 4IR, as they enable people to socialise with one another. To support this claim, a study by Budden (2017) revealed that master's students enjoyed sharing information informally using software such as WhatsApp. This application made it easier to communicate and help each other with dissertation research writing. In a similar vein, Sokhulu (2020) reported that master's students used WhatsApp software to informally communicate

research matters with their supervisors during the COVID-19 lockdown. Thus, these students promoted a socialisation experience. This study further suggested that other students also preferred WhatsApp over emails, there being fewer rules to follow. These findings imply that, although students may be good with digital technologies, they often excel in using such for socialisation experiences rather than professional experiences. Students also seem to enjoy socialising even when attending to their formal research needs. Moreover, as evidenced in Budden's study, engaging in a social space provides students with opportunities to learn from others (Cavus et al., 2007; Le Grange, 2016). The above studies reflect that learning and research practices can result in socialisation experiences. Hence, some students find social learning preferable because one does not have to follow formal instructions (Khoza, 2017a; Mpungose, 2018).

Reviewing experiences of using digital technologies for either socialisation or professionalisation has shown that students can draw from any of the two experiences to address their individual needs. However, in this section, an imbalance is seen in that students prefer using digital technologies for socialisation over the professionalisation experience. This imbalance creates tension between the two experiences, with one outweighing the other. For example, when the socialisation experience is prioritised over professionalisation, the strengths of professionalisation may be neglected, even when useful to a student's experience. This present study's claim resonates with Biesta (2015) argument that often, there is a bias towards one of the two experiences (socialisation or professionalisation). A study should be conducted to harmonise both experiences (socialisation and professionalisation); to create or drive neutral personalisation experiences. The present study aims to complement the two experiences, forming a strong unit to eliminate any tension between the two. The following section discusses the use of digital technologies for personalisation experiences drawing from strengths of both socialisation and professionalisation to address individual needs.

2.2.3 Personal (personalisation) experiences

2.2.3.1 Conceptualisation of personalisation experience

Personalisation is one of the three experiences that influence the way people use digital technologies. According to Khoza (2017a), personalisation experiences are determined by a student's individual needs. Similarly, Schiro (2013) explains that personalisation experiences are made of personal meaning, unique knowledge and development that individuals acquire

over time. In addition, personalisation experiences are unique to all people and can be shaped by socialisation (Schiro, 2013). Even though Khoza (2017a) and Schiro (2013) report on the conceptualisation of the personalisation experience, they only discuss it based on socialisation and personal need. This study argues for expressing personalisation as an experience generated from the strengths of both professionalisation and socialisation experiences. These strengths involve students' use of digital technologies to benefit their overall professionalisation and socialisation needs to help them self-actualise (resulting in a unique personalisation experience) (Sokhulu, 2020).

While reviewing the literature on the use of digital technologies for personalisation experiences, it was noted that this personalised experience had not been a fully developed space in literature; whereas all other experiences are addressed in multiple studies (Bernstein, 1999; Khoza, 2019; Khoza & Biyela, 2019). Although socialisation and a professionalisation attribute significantly towards theorising on students' realities with digital technology, personalisation experience is equally important, and needs to be clearly outlined (Khoza, 2015). As a result of these findings, this study aims to focus on students' personalised experiences of using digital technologies in research.

Moreover, of the few studies that research the personalisation experience, scholars have used different concepts to refer to this kind of experience. For instance, Prensky and Berry (2001) referred to users' personalisation experiences as 'unique identity'. On the other hand, Biesta (2015) argued against the use of 'identity' and promoted 'subjectification' in representing 'personalisation'. He further argued that the use of 'subjectification' provides more qualities of being a subject based on ideas of autonomy, responsibility, and capacity for judgement. In contrast, 'identity' can relate to socialisation, which identifies with existing and traditional practices (Biesta, 2015). These definitions imply that the phenomenon of personalisation experience is debate worthy. As evident from the above discussion, researchers are continuously theorising on the phenomenon. Therefore, as a contribution to the field, this unique and subjective experience (as alluded by other researchers) is conceptualised and maintained as personalisation throughout this study. The following discussion expands on various stakeholders' use of digital technologies to inform a personalisation experience.

2.2.3.2 Personalisation experience as noted in various studies

2.2.3.2.1 Personalisation experience in teaching

As argued above, many studies have identified the use of digital technologies for promoting either socialisation or professionalisation experiences, to the neglect of personalisation experiences (Budden, 2017; Czerniewicz & Brown, 2014; Grant & Osanloo, 2014; Khoza, 2016; Khoza, 2016b; Khoza, 2018; Mpungose, 2018; Ngubane-Mokiwa & Khoza, 2016). In the same vein, Khoza (2017b) established that students are limited in using digital technologies for personalisation experiences although they are good with using them for socialisation experiences. To extend his claim, Khoza (2018) pronounces that there are still major issues with balancing professionalisation and socialisation experiences to address personalisation experiences: personalisation experiences can be generated from either of the two categories. Thus, in the same study, Khoza (2018) established that six Grade 12 teachers in South African schools found it easy to use various digital technologies such as Facebook and emails to communicate with their students. Facebook was used by these teachers to communicate informally with students, while emails were used to convey formal instruction. The study also revealed that these teachers enjoyed the use of these digital technologies as they supported blended learning. Blended learning involves the converging of the face-to-face traditional mode of learning with a digital learning environment that occurs through the use of digital technologies (Oliver & Trigwell, 2005). Therefore, this study suggests that the teachers were able to attend to their personal teaching needs, being able to use both social (Facebook) and professional (emails) -software digital technologies -to ensure that their blended teaching and learning needs are met.

However, even though the above study has shown that people can draw from both socialisation and professionalisation to address the personalisation experience with digital technologies, other studies have found that it is still possible to address teaching needs by only drawing from the strengths of professionalisation experiences. For instance, two studies (Mpungose, 2018; Bansilal, 2015) negotiate the use of digital technologies for personalisation experiences, drawing from the professionalisation experience. As a result, in these studies (Mpungose, 2018; Bansilal, 2015) personalisation experiences were limited to professional experiences. This caused an imbalance in experiences that contribute to one's personalisation experience. Biesta (2015) warned that excessive pressure on people to explore only one experience

(professionalisation or socialisation) might jeopardise their personalisation experience. Also, from the above studies, it is not clear what aspects (strengths or weaknesses) of professionalisation experiences were drawn into the personalisation experience of participants. Hence, incorporating a specific and clear position of both professionalisation and socialisation experiences may aid in finding personal enjoyment and meaning in using digital technologies to self-actualise (McLeod, 2007).

In addition, using digital technologies to address personalisation experiences allows one to draw from their historical and cultural experiences stored in the subconscious mind (Khoza, 2011). Similarly, Khoza (2018) asserts that personalisation experiences may be generated and dominated by socialisation or professionalisation experiences, based on the individual's history and culture of using digital technology. Personalisation experiences have come under recent scrutiny to reveal users' individual history and culture of using digital technologies. Studies conducted by Khoza (2015b); Özbek (2016); Orlanda-Ventayen (2018) suggested that teachers in schools have used Turnitin to detect plagiarism, providing feedback to students. These studies similarly project that the teachers' personalisation experiences with Turnitin were shaped by how the teachers have previously used Turnitin professionally in their classroom. This previous and professional experience with Turnitin contributed to the teachers' current use of the Turnitin software practices. Therefore, one's history and culture of using digital technologies seem to affect continued use of other digital technologies going forward. In these studies, the teachers' use of digital technology is solely drawn from their professional history.

Moreover, using video-tape observations and interview methods, Hardman (2005a) conducted a case study to explore the use of digital technology (computer) in a mathematics classroom. The study findings implied that one of the sampled teachers limited his learners from interacting creatively with computer software. This limitation was owed to the teacher's lack of knowledge and skill in computer functioning. Similarly, a study conducted by Chigona et al. (2010), reported teachers who lacked confidence in their computer literacy skills were not comfortable with using computers to teach their learners. These findings suggest that the teachers' personal experience with digital technology controlled and limited how they professionally taught using digital technologies, thus disadvantaging learners' experiences of using digital technologies. These teachers' limitations were driven by how they historically

experienced the use of digital technology. For example, the teachers in both studies were from disadvantaged South African schools. Teachers had received minimal exposure to digital technology use, professionally or otherwise. Hence, their lack of experience with digital technologies shaped and limited the way in which they taught learners in class (Gretschel, Ramugondo, & Galvaan, 2015).

2.2.3.2.2 Personalisation experience in learning

Students also reflect their personalisation experience in digital technology use for learning. Khoza (2016a) and Maxwell (2013) similarly, allude to personalisation experiences requiring a space for self-reflection and evaluation. Chigona et al. (2010), substantiates this notion, stating that a person's willingness to use digital technologies may be dependent on their social or professional perspectives. Such standpoints inform their personalisation experiences. Thus, Khoza (2015a) suggests that personalisation helps one build a unique experience by balancing both socialisation and professionalisation experiences. Of the few studies that explore personalisation experiences from the perspectives of both professionalisation and socialisation, Khoza (2017a) indicates that students used Moodle as personal space. Moodle assisted them in understanding academic content by socialising with one another and also professionally interacting with their lecturers. In this way, students could attend to their personal learning needs by following lecturer instructions, and socially conversing about academic contents through Moodle. Major, Sawan, Vognsen, and Jabre (2020) supported Khoza's (2017a) findings. During the COVID-19 lockdown, health science students were able to use a variety of digital technologies to address their social and professional learning needs. For example, they used Zoom and email software to communicate on their academic contents with their lecturers. Students also used social media such as WhatsApp to informally engage with one another about clinical contents.

Khoza (2016a) further emphasises that students can use various digital technologies for both professionalisation (writing assignments) and socialisation experiences (entertainment). Participants from the studies (Khoza, 2017a; Major et al, 2020; Khoza, 2016a) were aware that they could use digital technologies for various experiences in order for them to attend to their personal needs. However, these studies (Khoza, 2015a; Khoza, 2017a; Major et al., 2020; Khoza, 2016a; Singhal & Rogers, 2012) claim that the two experiences are balanced without

reflecting whether they should be balanced with their weaknesses or with their strengths only. Therefore, this calls for a study to explore the use of digital technologies from the specific position of balancing the strengths of professionalisation and socialisation experiences to address personalisation experiences. Personalisation experiences are a foundation for both strengths of socialisation and professionalisation experiences informed by individual needs (Maharajh, Davids, & Khoza, 2013).

Furthermore, McLeod (2007) discusses a limitation associated with personalisation experiences, by explaining that it may take a long time for people to reach self-actualisation because of disruptions and failures met along the way in their prior experiences (socialisation and professionalisation weaknesses). Hence, ways to overcome these weaknesses in all experiences must be also be indicated in literature (McLeod, 2007). This study is significant in that it provides implications for student researchers, providing them with guidance on how to achieve quality personalisation experiences.

2.2.3.2.3 Personalisation experience in research

Using digital technologies for personalisation has also been adopted in multiple research practices. During this 21st century it is almost impossible to conduct research without the use of certain digital technologies. As a result of the digitalisation of research practices, many researchers have had to choose which digital technologies they employ in their studies, guided by their needs with other digital technology used on a mandatory basis. Moreover, the use of digital technologies to meet personal research needs has been most prominent during the outbreak of the Coronavirus pandemic (COVID-19), which affected most research practices during the year 2020. This novel virus affected the human respiratory system and is easily spread through cough, sneezing, and physical touching of an infected person (World Health Organisation, 2020). The high spread of the virus propelled countries around the world to go on nationwide lockdown, which promoted quarantine and physical distancing as a means of combating the spread of the virus. The strike of this COVID-19 pandemic caused an increase in the use of digital technologies to ensure productivity and the continuation of activities in various fields, including research (Mishra, Gupta, & Shree, 2020).

As a result, academics and postgraduate research students were encouraged to find innovative ways of continuing with their research, using remote methods in order to address their personal study needs (Hedding, Greve, Breetzke, Nel, & Van Vuuren, 2020). In this light, Shenoy, Mahendra, and Vijay (2020) conducted their study using digital alternatives such as online survey through Google Forms (professionalisation) and WhatsApp (socialisation) as a means of generating data and communicating with participants. These methods ensured physical distancing, and allowed the researchers to attend to their data generation needs through social and professional digital platforms. Another ethnographic study by Jayadeva (2020) collected data through Facebook and WhatsApp socialisation methods to understand more about master's students' experiences as affected by the COVID-19 pandemic. Other researchers used digital technologies such as Zoom, Skype and Google to remain connected to their studies and make progress with their academic work (Hedding et al., 2020).

Kapasias et al. (2020) noted that postgraduate students used Zoom, Skype and Google Meet to formally communicate with their lecturers and WhatsApp, to share study materials with other students and friends. Similarly, Sokhulu (2020) revealed that some master's students used Zoom to formally defend their research studies, and WhatsApp to communicate with relevant stakeholders in their research community. The above findings indicate that students used professionalisation and socialisation digital technologies to address various research needs which they identified in their studies during the COVID-19 lockdown. However, it was not clear how these digital technologies were categorised. Therefore, the following discussion expands on the types of digital technologies that can be used in research according to hardware and software categories. The discussion begins by exploring the conceptualisation, history, and innovation of digital technologies.

2.3 Used digital technologies (resources)

The concept of digital technology is made up of two terms 'digital' and 'technology'. This section begins by defining both terms separately before discussing them as one concept (digital technology). The discussion further highlights a few studies on the experiences of using digital technologies in educational contexts. Dodge et al. (2008), explain that digital means engaging in online activities using a range of technologies. Similarly, Spiers, Paul, and Kerkhoff (2019)

discuss that being digital involves using technological gadgets to engage in virtual activities across multiple media forms. In defining technology, Lazar (2015) mentions that the term technology is derived from a Greek word 'techne' which can be translated as art, craft, or skill. The Greek word 'logos' means 'learning', reason or 'science'. Therefore, it can be said that technology is machinery and equipment created as a result of scientific knowledge and skill being applied.

In an earlier study, Asabere and Enguah (2012) asserted that technology can be broadly theorised as the equipment, facilities, processes or tools that provide transmission, processing and disseminating information to people. Thus, it should be noted that there is no single way to theorise the concept of technology. However, when the concepts 'digital' and 'technology' are combined to be reconceptualised as one, Irvin (2007) noted that digital technologies are scientifically advanced tools which can be used to communicate information virtually. Thus, digital technology as a concept can then be theorised as electronic resources that are generated through the use of science to help produce, store, and allow one to share information virtually (Ozdamli, 2017). Njenga (2018) also discussed digital technology as a pervasive and powerful Internet tool characterised by accessible and reliable communication.

To reveal the history of digital technology and its innovation, a theoretical and comparative study conducted by Pelgrum and Law (2003), discussed that in the 1980s the term 'computer use' was changed to that of 'Information Technology' (IT) which later was replaced by the label Information Communication Technology (ICT) in the early 1990s. As part of ICT, electronic mail was discovered and made available to the public, followed by Internet services, telecommunications, media, information technology equipment, and network-based services (Pelgrum & Law, 2003). UNESCO (2002), further clarified that ICT combines informatics technology specifically for communication purposes. The findings on the history of digital technologies suggests that they have been around for some time and are constantly being improved to meet the needs of society.

As a result of this technological innovation, Noor-Ul-Amin (2013) established that the use of digital technologies has been widely used in various fields and in educational contexts for teaching learning and research. Exploring teachers' influences in transforming teaching practice through using digital technologies, Blundell, Lee, and Nykvist (2016) indicates that

teachers use digital technologies as educational resources to enhance students' learning experiences. As a result, various educational and research institutions use digital technologies to virtually connect with their students using a range of software and hardware tools (Government, 2015; Kapur, 2018). In research, Kapur (2018) asserted that digital technologies are used by universities to allow postgraduate students to access various (online) articles, research papers, journals and books. Nonetheless, even though these studies have presented how digital technologies have transformed educational and research practice, they are still silent about experiences that drive digital technologies. This study is significant in that it discusses students' experience as influenced by socialisation and professionalisation in order to produce a unique personalisation experience. The discussion below expands on specific research digital technologies that may be employed in education and research practices according to hardware and software resources.

2.3.1 Research digital technologies

There are different kinds of digital technologies used to implement teaching, learning, and research activities. Khoza and Manik (2015) posit that, similarly to other sectors, higher education has also been influenced to use various digital technologies in postgraduate research studies. In the same vein, Lazar (2015) also announces that digital technologies are essential for conducting studies. In addition, Biswal and Panda (n.d) maintain that teaching, learning, and research in the 21st century have been vastly affected by the use of digital technologies. Hence, a desktop study by Czerniewicz et al. (2004) revealed that, since the early 2000s, there were many interests to improve technological advancement in various universities in South Africa and thus, new digital technologies are introduced to students.

As a result of the introduction of digital technologies to universities for teaching, learning and research, this present study has conceptualised the digital technologies used in research as the 'research digital technologies'. This speaks to the various hardware and software resources that have been employed for academics and postgraduate students to use for research purposes. On a more specific note about these resources, Khoza (2012) discusses that research digital technologies are segmented into three kinds of resources, namely, hardware-computers and other machines, software-applications, and programming (digital technology in research), and ideological-ware ideologies, experiences, or theories (digital technology of research). In a

similar way, Biswal and Panda (n.d) discuss that research digital technology can be interpreted in two ways. This includes digital technology in research and digital technology of research. Thus, owing to these digital technologies, schools and universities have radically changed their practices over recent years to digital practices (Dey, 2017). Furthermore, the research digital technologies used in universities supports knowledge construction in any activity (Jonassen, 1996).

A study conducted by Khoza (2016) pronounces that, in experiences of using research digital technologies, universities have developed relevant resources to improve learning environments and students' performances. However, Ngubane-Mokiwa and Khoza (2016), and Bansilal (2015) assert that for efficient use of research digital technologies one must have relevant skills, in order to have meaningful personal experiences. Thus, lacking technological skills can cause barriers or problems with using digital technologies (Bansilal, 2015). In a qualitative case study exploring teachers' motivation when employing digital technologies in pedagogy, Chigona, Chigona, and Davids (2014) discovered that most teachers were demotivated when they had to 'teach the technology', instead of teaching with digital technologies. In other words, they had to teach their learners how to use digital technologies instead of using digital technologies to enhance learners' learning experiences. The teachers' demotivation indicates an unsatisfactory use of digital technologies for professionalisation experiences. The teachers first had to teach the learners about digital technologies. Furthermore, in postgraduate studies, master's students enrol in universities that have employed the use of research digital technologies. However, their skill with these technologies remains the underlying question (Khoza & Manik 2015). This implies a need for more studies to explore master's students' experiences of using digital technologies in research. The digital technologies used in research involve hardware and software technologies which are discussed sequentially below.

2.3.2 Digital technologies in research (hardware and software resources)

Digital technologies in research, can be any technological tool that you can see or touch (Budden, 2017). Also, digital technologies in research comprise the various hardware and software resources in higher education (Khoza, 2016). Amory (2010) further notes that these digital technologies used in research (hardware and software) greatly affect the university community and its function. Thus, in South Africa, the government has employed digital

technologies in all areas of education to help citizens compete at a global level (Budden, 2017). In the higher education context, studies (Budden, 2017; Ng'ambi, Brown, Bozalek, Gachago, & Wood, 2016) reveal that digital technologies allow universities to build online software resources, so that students can enhance their research imperatives. This digital practice suggests there is a global shift from the old reading and writing to learning via digital platforms. Gillwald, Moyo, and Christoph Stork (2012), further discuss that the employment of digital technologies in higher education and research practices is varied. This variation indicates that some institutions of higher learning employ digital technologies for Web-based teaching and learning and for distance learning while others implement it as a learning design relevant to students' level of engagement with information (Khoza, 2013).

2.3.2.1 Hardware digital technologies (resources)

Resources are materials used for various services and are the backbone of activities (Mensah & Castro, 2004). Khoza (2016) stipulates that, in educational contexts, a resource can be any object that can communicate learning. Drawing from early philosophers of educational technology, Kuutti (1996) discussed resources as anything (tools or materials) that can be used to transform teaching, learning and research. Regarding digital technology resources, hardware resources are conceptualized under the digital technology in education (Budden, 2017). According to Khoza (2012), hardware digital technologies are the tools, machines, and other physical technologies that can be seen and touched. Similarly, Govender and Khoza (2017) state that hardware digital technologies can be any tangible digital tool that performs basic and logical functions in teaching, learning, and research: for example, laptops, computers, smart boards, cell phones and overhead projectors. Mpungose (2018) also suggests that hardware digital technologies allow for information processing and storage, for example, the hard drive, internal memory, or output hardware (e.g. microphone, printer).

A study conducted by Aitokhuehi and Ojogho (2014) through survey research indicated that high school students in eastern Nigeria used hardware digital technologies such as computers to perform better in 'research' related assessments. The findings of this study suggest that these Nigerian schools implement the use of hardware digital technologies such as computers for professionalisation experiences. Findings also suggest that the Nigerian Department of Education is blending with the 4IR movement by incorporating the use of digital technologies

into their basic education system. However, it is not clear from the findings whether students enjoy or struggle with digital technologies. The study used quantitative survey methods that did not allow participants to expand on their experiences.

Another action-research study conducted in Lehman by DelliCarpini (2012) reveals that, even though teachers used hardware digital technologies such as computers and cellphones at home (personal lives), they reported issues integrating same hardware digital technologies into the classroom for professional use. Digital technologies may be a barrier to the teaching and learning process when teachers have low competences for using them in professionalisation experiences. However, Bansilal (2015) explored student teachers' perceptions of using digital technologies in learning and teaching mathematics using the questionnaire method. The findings of the study indicated that student teachers used hardware computers effectively to explain and demonstrate mathematics content. In this context of the discussion, the findings imply that younger teachers (digital natives) find it easier to use digital technologies for professionalisation experiences than older teachers.

Moreover, Czerniewicz et al. (2004) stress that other hardware digital technologies used in higher education include computers, multimedia machines, laptops, CD-ROMS, and printers. Thus, Anyanwu (2014) revealed that the majority of students in his study were presented with challenges. Students were frustrated by receiving feedback on their research assignments via emails which they had to access using hardware digital technologies such as computers and laptops. On the contrary, a quantitative survey conducted at a university in Melbourne reported that students had unlimited access to hardware digital technologies such as cellphones, computers, memory sticks and digital cameras, which they used effectively for various social and academic purposes Kennedy et al. (2008). The findings of these studies (Kennedy et al., 2008; Anyanwu, 2014) show that, over the years, students (globally) have been exposed to a multiplicity of hardware digital technologies. However, their experiences differed in that some students enjoyed using these resources, while others had difficulty using them effectively for their studies. Many factors contribute to the uneven student experiences, such as age, context, and social and professional exposure (Khoza & Manik, 2015; Prensky, 2001; Straus & Howe, 1991).

In a similar vein, Czerniewicz and Brown (2014); Kennedy et al. (2008) propose that students preferred using digital technologies such as hardware (cell phones) to communicate socially with their friends, family members and fellow students. What is suggested by these studies is that using hardware digital technologies such as cell phones socially, without following formal instructions, may be an easier experience for some students. When students have to use hardware digital technologies to follow particular instructions, this, conversely, makes activities seem difficult to implement, thus generating undesirable experiences (Hardman, 2005a). Another type of digital technology (software) is found within hardware that students use for their professional, social, and personal needs. The discussion below elaborates on this type of digital technology.

2.3.2.2 Software digital technologies (resources)

Software digital technologies are another type of digital technology used in research. Khoza (2017b) discusses such as materials that show digital information. These include application software, programming software, application software, and other materials that carry data. Similarly, Budden (2017) postulates that software digital technologies are the materials generated for hardware digital technologies to communicate learning or display information. Mpungose (2018) concluded that software digital technologies are used to show data, for example application software (PowerPoint, YouTube, blogs, spreadsheets) and many others. Fraillon and Ainley (2010) argue that students use various software digital technologies to engage with and complete their academic studies. To support this argument, Oliver and Goerke (2007), conducted a survey study to explore students' use of digital technologies in learning at an Australian university. The findings of the study were that university students successfully used online software digital technologies (blogs, instant messages) for academic purposes. In a similar way, a study conducted by Khoza and Manik (2015) agreed that master's students used software digital technologies such as personal emails to communicate with their supervisors during their study. Software digital technologies are therefore used by students for professionalisation experiences.

Students also use software digital technologies to find data, share files and study information in both socialisation and professionalisation experiences. Software include Learning Management Systems (LMS), social networks, web engines, and learning portals (Budden,

2017; Kennedy et al., 2008). For professionalisation, universities have built online software digital technologies such as Moodle for postgraduate students to enhance their research imperatives (Budden, 2017; Ng'ambi et al., 2016). These professionalisation activities include retrieving articles, completing academic tasks, and communicating with supervisors and fellow students. For socialisation, Francis and Hardman (2018) remark that students used various social media (software applications) to protest for free education in universities of South Africa. Thus, students informally shared important issues amongst themselves and the general public. Studies (Eijkman, 2009; Gerbaudo, 2012) validate Francis and Hardman (2018) findings by stipulating that university students have used social media globally to voice their concerns. For these reasons, Gerbaudo (2012) suggests that universities should adopt social media software as an inclusive learning and knowledge generation space— such software having a huge influence on students' lives. As a result, students are using social media informally to discuss ways of completing research studies (Budden, 2017). Moreover, during COVID-19 Sobaih, Hasanein, and Abu Elnasr (2020) maintain that universities in developing countries that lack technological resources were compelled to use social media such as WhatsApp, Facebook, and YouTube to sustain formal teaching and learning.

Also, a case study conducted by Amory (2010) identified that using software digital technologies such as computer-based video games mediated and supported learning for learners between ages 14-19 years. The findings of the study further confirmed that the use of computer software was best experienced with support from one another (social collaboration) in order for learners to complete their academic tasks. These studies provide evidence that the use of different software digital technologies occurs widely across all levels of education (primary, secondary, tertiary) for various experiences. In addition, these experiences affirm that, even though particular software were designed for socialisation (entertainment and informal activities), such can also be effective for a professionalisation experience, thus addressing students' personal learning needs.

To add to the valuable experiences of using software digital technologies in students' learning, studies (Forster, 2006; Steketee, 2010; Tall, 2010) have found that mathematic software applications granted students opportunities of manipulating graphs and tables to benefit their learning. Although there has been vast research into students' experiences of using different

software digital technologies for learning, scant research explored students' experiences specifically in research and postgraduate studies. This scarcity suggests a need for a study that will particularly explore master's students' experiences of using digital technologies in their research studies. In addition to exploring these experiences, there is also a need to discuss the ideologies that guide the way digital technologies are used in research and other areas of life.

2.4 Digital Technology of Research

Digital technology of research refers to the ideas and theories that raise awareness about social phenomena to guide activities such as conducting research (Khoza, 2013). These theories help researchers to understand the ideological drive behind processes and activities (Wilson & Peterson, 2006). In addition, digital technology of research is also known as ideological-ware resources. Such resources cannot be seen or touched but can be produced by hardware and software resources (Khoza, 2011). In a similar way, Lesser and Pearl (2008) discuss that hardware and software resources work together to display ideas, and theories (ideological-ware) generated from the experiences of using digital technologies. In other words, digital technology of research can be explained as ideological-ware resources that involve philosophies that guide people's experiences.

Furthermore, Govender and Khoza (2017) and Khoza (2015) refer to ideological-ware resources as the intangible knowledge, thoughts, concepts, and theories behind the use of digital technologies. Squire (2008) asserts that, even though there are theories that guide the use of digital technologies, new theories are still needed to add to the body of knowledge that exists on these philosophies. Moreover, Khoza (2018) argues that ideological-ware resources are needed to drive personalisation, professionalisation, and socialisation experiences. In essence, ideological-ware resources can be employed in research to shape and transform the experiences of those using digital technologies (Khoza, 2015a). In other words, ideological-ware can be used to inform the experiences of those using digital technologies in various domains.

Amory (2010) indicates that educational and research activities utilise various ideas and resources, thus generating relevant theories and concepts on how these resources may be beneficial to learning and research. The theories that seem to guide the experiences of using

digital technology include the Cultural Historical Activity Theory (CHAT), the Technological, Pedagogical and Content Knowledge (TPACK), the Constructivism theory, and other new theories such as the Unified Theory of Acceptance and Use of Technology (UTAUT) (Mpungose, 2018). With these theories, researchers are provided with particular ways of viewing phenomena to shape their ideas on how to go about their studies (Markham & Baym, 2008). Hence, more studies must be conducted on the experiences of using digital technologies, to produce new theories that may assist in understanding the use of digital technologies in research.

2.4.1 TPACK theory

Over the recent years TPACK has been used as a theoretical framework to guide teachers' and lecturers' use of digital technologies in their professional practices (Chai, Koh, & Tsai, 2010; Graham, 2011). Koehler and Mishra (2009) and Koehler, Mishra, and Cain (2013) explain that TPACK is a theoretical framework that explores the effectiveness of digital technology use for teaching. The researchers further posit that TPACK is derived from three components that include technological knowledge (TK), content knowledge (CK), and pedagogical knowledge (PK). Furthermore, TPACK was initially generated from the Pedagogical Content Knowledge theory (PCK). This was a curriculum theory extended to accommodate the use of digital technologies in teaching (Graham, 2011; Koehler & Mishra, 2009; Koehler et al., 2013).

In a single case study exploring how a lecturer uses digital technologies to prepare for teaching and learning in an Australian university, Bibi and Khan (2017) use TPACK to indicate a lecturer's understanding of employing specific technological resources to inform his teaching. Similarly, Ngubane-Mokiwa and Khoza (2016) employed TPACK as a theoretical framework to conduct a study exploring the experiences of lecturers' use of digital technologies to teach Science, Technology, Engineering, and Mathematics (STEM) at an institution of higher education in South Africa. In both the studies, the use of TPACK helped in analysing lecturers' competences using digital technologies for innovative teaching.

Harris and Hofer (2011), explored teachers' use of digital technologies to plan for the teaching and learning process. The study findings were produced from the experiences of seven social

sciences teachers, using reflective journals and interviews. Moreover, to frame the study, TPACK was used to analyse the teachers' experiences. Thus, in studies: Bibi and Khan (2017); Ngubane-Mokiwa and Khoza (2016); Harris and Hofer (2011), TPACK has been used as an analytic guiding lens for lecturers' and teachers' experiences of using digital technologies in education. However, the framework is limited because it focuses greatly on knowledge as having a major effect on how people use digital technologies. In other words, it considers knowledge only as a product of experience. The other limitation identified with this theory is that TPACK assumes that teachers or lecturers are the prominent people that use digital technologies in education, thus failing to acknowledge other stakeholders such as students, as digital technology users.

2.4.2 Constructivism theory

There are several other theories (Connectivism, Substitution Augmentation Modification Redefinition Theory, Technology Acceptance Model, and Entertainment Education Theory) that can be used to explore and guide the use of digital technologies in research. The theories are used as ideological-ware resources that allow researchers to explore more facts and to guide studies on various phenomena that occur globally (Mpungose, 2020a). One of the most prominent theories within digital technology exploration includes the Constructivism theory founded by John Dewey, Jean Piaget and Lev Vygotsky. Constructivism theory has been used to analyse the experiences of using digital technologies in education and research. Bada and Olusegun (2015) discuss constructivism as a theory that focuses on how people learn through experiences. Such involves connecting prior ideas and experiences with new ones. Hein (1991), further points out that constructivism theory promotes the idea that people construct knowledge through social experiences in order to make meaning.

Thus, a theoretical study conducted by Gilakjani et. al., (2013) on teachers' use of digital technology in a classroom context used the constructivism theory to reveal the usefulness of adopting digital technologies such as computers and the Internet for teaching and learning. The study further revealed that digital technologies helped with constructing social and individual learning for students in order to make meaning of course contents. Using theoretical methods Kaya (2015), similarly, conducted a study to explore how digital technologies are used to promote communication between students in an English learning module. The study also

employed constructivism theory to guide the role of learning with digital technology in a social constructivist environment. The findings of the study declared that students used digital technology resources such as Blogs, Learning Management Systems and many other computer application programmes to communicate and present information studied. The main limitation projected by these studies in using constructivist theory as a framework is that it dwells significantly on use of digital technologies for socialisation experiences requiring one to learn ‘with’ technology. This one-sided experience shows neglect of other experiences (professionalisation) that allow one to learn ‘from’ technology in order to address diverse personal needs (Amory, 2007; Gilakjani, Lai-Mei, & Ismail, 2013; Khoza, 2015b).

2.4.3 Community of Practice (CoPT), Entertainment Education Theory (EET) and Learning Management Platform (LMP)

Likewise, other studies (Chigona, 2013; Smith, Hayes, & Shea, 2017) incorporate theories such as Community of Practice (CoPT) to explore the experiences of using digital technologies in higher education and research. Cox (2005), explains the Community of Practice Theory as one which focuses on creating social identities for people participating in the same activity. Similarly, Farnsworth, Kleanthous, and Wenger-Trayner (2016), propose that the Community of Practice Theory alludes to social phenomena that involves the participation of a group of people engaging in any kind of action. Thus, Chigona (2013) conducted an interpretive case study through focus groups and interviews to explore 60 pre-service teachers’ use of digital media to present their digital stories on their culture and background. The findings of the study displayed that the adoption of the Community of Practice Theory aided in the understanding of the group of students’ identities. Students thus formed a community that celebrated one another’s diversity, while enhancing their technological skills. As with the constructivism theory, the CoPT lens focuses much on socialisation experiences of using digital technologies. Additionally, it aims at building social identity for people without the consideration of personal identity that is addressed by individual needs.

A few theoretical frameworks have proven to attract or consider both socialisation and professionalisation experiences. For example, Khoza (2012) adopted the Entertainment Education Theory (EET) to conduct a study exploring how a facilitator and postgraduate

students use various digital technologies to promote active learning. This included entertainment while offering formal educational activities. The study argued that postgraduate students balance learning ‘with’ digital technologies (social) with learning ‘from’ digital technologies (professional) in order to address individual needs. Thus, Singhal, Cody, Rogers, and Sabido (2003); Singhal and Rogers (2012), further highlight that the EET endorses the use of digital technologies for entertainment (informal) and formal education. Digital technologies thus create suitable learning experiences for individuals according to their needs.

Moreover, Mpungose (2019) conducted an interpretivist case study, exploring three physical sciences lecturers’ reflections of using Moodle to decolonise the curriculum of a module offered at a South African university. The study made use of the Learning Management Platform (LMP) theory as a guiding lens (in order to re-contextualise with existing ideas) which draws from the informal, formal, and non-formal experiences in using digital technologies for education and research (Khoza, 2017a). The study used the LMP theory to frame lecturers’ use of Moodle to decolonise the curriculum according to informal (socialisation), formal (professionalisation), and non-formal (personalisation) ways. Even though the LMP theory considers all three experiences, it limits each experience (informal, formal and non-formal) strictly to a specific digital technology resource. For example, the formal experience is limited to hardware resources; the informal experience is limited to certain software resources and the non-formal experience is restricted to ideological-ware resources.

2.4.4 Cultural Historical Activity Theory (CHAT) and Unified Theory of Acceptance and Use of Technology (UTAUT)

Theories such as CHAT can also be used to explore the experiences of using digital technologies. For instance, studies conducted by Amory (2010), Amory (2011), Francis and Hardman (2018) and Hardman (2005a) explore experiences of students’ and teachers’ use of digital technologies (hardware and software resources) for the teaching and learning process. In common, these studies employ the CHAT theory as a guiding lens. Vygotsky (1978), comments that CHAT is a socio-cultural lens which can be used to analyse human activities using technology. Similarly, Kuutti (1996) explains that CHAT is an analytical framework used to understand tool-mediated knowledge construction through its concepts. This includes an

extensive discussion of Actors, Tools, Rules, Community, Division of Labour, Objects and Outcomes. Therefore, people's activities are mediated by tools such as digital technologies closely associated with Rules, Community, and Division of Labour, in order to achieve particular goals (Engestrom, 2000; Engeström, 2001). Using CHAT, studies: Amory (2011) and Hardman (2005a) were conducted to explore how teachers use computers (hardware) and video games (software) to teach maths and science content. CHAT was used to identify how digital technologies (computers and video games) mediated learning for students, leading to transformed learning. Similarly, Amory (2010) used CHAT to explore how students use digital technologies (digital games) for collaborative (and cultural) learning. Such involved the division of labour with the goal of solving mathematics problems provided to students. In all three studies, the findings indicated that the students enjoyed the use of digital technologies for learning; while some teachers experienced difficulties in using computers and video games for teaching and learning.

The use of theories in these studies emphasise the importance of ideological-aware resources in exploring experiences of using digital technologies. Therefore, to support the use of ideological-aware in exploring experiences of using digital technologies, this study has identified CHAT and UTAUT as two theories suitable to study master's students' experiences of using digital technologies at a particular university in South Africa. CHAT is used as an overarching theory, and UTAUT as a secondary penetrating theory. Furthermore, both these theories are used to generate a new analytical framework to help analyse, interpret and theorise findings.

Moreover, CHAT is selected, being an effective theory to use in research because it can be applied to various experiences (socialisation, professionalisation, personalisation). The CHAT is useful when exploring how people interact with others and the resources around them (Kaptelinin, 2005). Furthermore, over the years, CHAT has proven to be a powerful and descriptive tool to help analyse and understand human engagement with various activities using artefacts (Nardi, 1996). The CHAT theory explores beyond what is provided at surface value. It is a socio-cultural theory that also draws deeply from the culture and the history of engaging in particular activities (Kaptelinin, 2013). Nonetheless, while CHAT is effective in identifying

important research activities that require digital technologies, it may require another theory that interrogates beliefs and acceptance of digital technologies that it does not consider.

UTAUT is a fairly new theory that has been in place for over a decade. The UTAUT has been utilised for exploring the experiences of using digital technologies (Venkatesh, Thong, & Xu, 2016). Venkatesh, Morris, Davis, and Davis (2003), synthesised some models to create UTAUT theory comprising four components: social influence, facilitating conditions, effort expectancy, and performance expectancy. Unlike other theories, UTAUT is different in that, it considers the beliefs and acceptance of digital technology users (Venkatesh et al., 2016). Furthermore, UTAUT has become the most utilised theory in many research domains such as Information Technology, Educational Technology and Computer Science owing to its prominence in analysing digital technology users' acceptance behaviour (Martins, Oliveira & Popovic, 2014). Both the CHAT and UTAUT theories are extensively discussed in Chapter Four of this study.

2.5 Stakeholders' involvement and contributions of using digital technologies

2.5.1 Theorising stakeholders

The concept of stakeholders has been in wide use across various disciplines, including media, management, education, and research, to name a few. According to Freeman (2010), stakeholders refer to the people who support a system or service to make it function effectively. Similarly, scholars such as Marumoagae (2018), Kaler (2002), Freeman (2004), Friedman and Miles (2006) indicate that the concept of stakeholder refers to people such as students, workers, consumers, or society at large who are affected by a particular system. Hasan and Kazlauskas (2014) agree that stakeholders are people who engage with a system via activities to achieve a particular goal. In other words, a stakeholder can be any person who engages in a particular activity to accomplish tasks.

Khoza and Mpungose (2018), Khoza and Govender (2017), and Bates (2015) argue that stakeholders' who use digital technologies in universities may include web managers, IT

technicians, academics and students. Students are stakeholders who engage with digital technologies to connect virtually with other stakeholders. Recent evidence from a study conducted by Mpungose (2019) on the use of Moodle confirms that university stakeholders have categories such as ‘instructor’, ‘lecturer’, and ‘students’ which they use online to connect for either socialisation or professionalisation experiences. The findings of this study also reveal that one lecturer used Moodle to convey instructions and formal contents of the module, while another lecturer indicated that his students made informal use of Moodle. Students shared ideas of their social life in relation to module contents on discussion forum platforms (socialisation experience).

Furthermore, Bond, Marín, Dolch, Bedenlier, and Zawacki-Richter (2018), Duderstadt, Atkins, Van Houweling, and Van Houweling (2002), and Lai (2011) attest to the introduction of digital technologies having changed the way information is communicated to stakeholders such as students and lecturers in universities. In the United Kingdom, Australia, USA, and Canada, students use selected digital technologies such as computers, the LMS and Web 2.0 to retrieve instructional information for their formal learning (Lai, 2011). Similarly, Bond et al., (2018) made use of questionnaires to generate data from both lecturers and students who are stakeholders using digital technologies for teaching and learning. The study concluded that both lecturers and students used limited digital technologies such as LMS (stud.IP), laptops, computers and software to communicate course-related information (professionalisation experience). Additionally, the lecturers used these digital technologies for organising purposes such as preparing for lectures and course administration in order to support learning. The students used the selected digital technologies to record lectures, store information, and to research phenomena presented for their assignments (Bond et al., 2018).

From the above studies, Lai (2011) and Bond et al., (2018) conclude that students and lecturers use digital technologies to address their professionalisation needs. Moreover, the use of digital technologies has become central to mediating teaching and learning. This differs from the traditional ways of learning that relied on physical contact sessions in order to convey instructions. As a gap the existing accounts only present the roles of students and lecturers in using digital technologies, overlooking other stakeholders’ (IT technicians and computer laboratory managers) roles in the functioning of digital technologies in universities. This

suggests a need for a study that will reveal these excluded stakeholders' contributions towards student experiences.

2.5.2 Community of digital practice

A community of digital practice as an independent concept refers to the view that learning is a relational process in which people interact with one another in shared digital practices (Hoadley, 2012). Similarly, Dubé, Bourhis, Jacob, and Koohang (2006) declare that a community of digital practice includes people that have common interests in a subject matter, and are to develop their expertise in that area by interacting with others online. Wenger (2011) also states that a community of digital practice is initiated when there is a shared domain. People can engage in a collective activity using technology resources to reach a particular goal. Sharing information collaboratively with others allows people to belong to specific communities of digital practice, resulting in personalisation (finding new personal identity). Furthermore, Holmes and Meyerhoff (1999) emphasise that the focal point of a community of digital practice is the shared activity (what the group of members do). Moreover, each member may use digital technology according to the history and culture of the community in order to be able to deal with any activity. Therefore, a community of digital practice can be formed anywhere and in any context, involving members' experiences, reflections and understanding of shared subject matter (Wenger, 1998).

Communities of digital practices can also be formed for specific activities that address professionalisation or socialisation experiences. Thus, there is a need for studies that demonstrate how individual members can find and understand their identities within the community, yet practise independently following the historical culture of the community without any limitations. Bosch (2009) argues that various hardware and software resources have formed digitally based communities which are well known as communities of digital practice. Similarly, Bostancioglu (2018) posits that digitally-based community of practice involves having a group of people who have a common interest. However, their interactions are facilitated by digital technologies such as computers and the internet. Thus, Dubé et. al (2006) argue that communities of practice within the use of digital technologies must be researched further. These particular communities of practice significantly differ from other communities of practice because of the 'digital technology' component involved.

In addition, with regards to the use of digital technologies for professional development, prior research studies by Guzey and Roehrig (2009), Vavasseur and Kim MacGregor (2008), and Scott and Scott (2010) have been consistent with Bostancioglu (2018) findings. These findings aver that teachers collaborate online to encourage, share and develop each other in a professional way. The findings further indicate a positive effect of using digital technologies for teacher professional development. This collective professional development creates an online community of digital practice in the teacher development area.

Moreover, Tsatsou (2015) argues that, in research, scholars use digital technologies throughout the research process to email, review literature, and share files with other scholars. Scholars therefore create a community of digital practice within the research domain. To extend their argument, Tsatsou (2016) conducted another qualitative case study which revealed that many researchers from different disciplines use digital technologies to conduct research. For instance, the study sampled scholars from education studies who collectively used multimedia digital resources to conduct research and generate empirical data. Some of these scholars attested to using online resources to contextualise their research and to build digital research communities. Similarly, a theoretical study conducted by Karpf (2012) concluded that researchers across disciplines used digital software resources to collaborate, influence and enhance one another's niche for new knowledge production. These studies (Bostancioglu, 2018; Guzey & Roehrig, 2009; Karpf, 2012; Scott & Scott, 2010; Tsatsou, 2015) provide evidence that communities of digital practices are constantly being constructed by various stakeholders in education and research. However, the communities of digital practice in these particular studies are limited to online platforms. This suggests the need for a study to explore how people (students) in a physical community of practice make direct use of different digital technologies for research purposes.

Providing a socialisation perspective, Chigona (2013) acknowledges that the use of digital technologies has grown vastly, not only in education and research, but also in entertainment. Likewise, Younes and Al-Zoubi (2015) discuss that digital technologies have influenced the social and economic experiences causing a massive digitilisation of activities. Naikoo, Thakur, Guroo, and Lone (2018), also posit that digital technologies help communicate important announcements and raise awareness about issues. For example, social networks such as

Twitter, Facebook, WhatsApp and YouTube can be used as platforms on which to protest against unsatisfactory services. Thus, in Ireland, people used social media such as Facebook, Twitter and YouTube to form a community of digital practice that protested against the altering of the protocol on the number of days the Union Flag could fly at Belfast City Hall (Reilly & Young, 2015). Using surveys and interviews as research methods, another study revealed that social media assisted mine workers spread information about protests against large-scale mining projects (Specht & Ros-Tonen, 2017). From the studies Lee (2002), Naiko et al., (2018), Chigona (2013), Tsatsou (2015, 2016), Karpf (2012), and Lindh et al., (2008) above, it has been evident that digital technologies are used by various stakeholders in society to form communities of digital practices in social communication, research, entertainment, education and online services. Such support both socialisation and professionalisation experiences to meet one's personalisation needs. It can be argued that the formation of community of digital practices allows people to be aware of their identities and contributions towards the use of digital technology. This suggests the importance of understanding one's identities that reflect within digital technology activities to meet their personal needs.

2.5.3 Student identities and activities of using digital technologies

According to Hasan and Kazlauskas (2014), an activity refers to what a person is doing, why they are doing it and how. The researchers further provide examples of what constitutes activities, which can involve teaching a module or engaging in a particular project. Furthermore, Gretschel et al. (2015), posit that an activity is a series of actions or simply the behaviour of a person or system. Yamazumi (2006), concludes that an activity is the actions people engage in to reach their specific goals. While participating in an activity, a person shares their unique identity with others in order to achieve a particular goal (Hashim & Jones, 2007). In other words, an activity involves engaging in particular behaviours that also informs one's identity.

Thus, activities that involve the use of digital technologies have become common for students of the 21st century, in preparing for the 4IR. As a result, some studies (Khoza, 2017a; Madge, Meek, Wellens, & Hooley, 2009; Thompson & Savenye, 2007) have explored students' use of digital technologies. Amongst these studies, Deng and Tavares (2013) conducted research to explore students' academic and social use of Moodle and Facebook to promote online

discussion. The findings of the study intimated that three factors contribute to students' use of Moodle and Facebook -individual, social, and pedagogical factors. The study further revealed that students were driven by social connectivity with peers (socialisation experience), course requirement, subject matter (professionalisation experience), and learning preference (personalisation experience), to use Moodle and Facebook for communication. The findings of this study suggest that students use digital technologies to address different experiences such as socialisation (social connectivity with others), professionalisation (retrieving course contents), and personalisation (individual factor) experiences to address their needs. Also, it suggests that the use of digital technologies such as Moodle and Facebook allows students to share their unique identities with others to inform their learning and to find their purposes in digital spaces (Mpungose, 2019).

Similarly, using qualitative ethnography Bosch (2009) conducted a study to explore the use of social network in teaching and learning. Madge et al. (2009) also conducted a survey study to explore social network integration in higher education learning. In common, the studies reported that students used social networks such as Facebook predominantly for social purposes. However, they also used such as an additional learning community to informally discuss course-related issues. These findings suggest that students preferred and appreciated digital hardware and software resources, as such as cell phones and Facebook for socialisation experiences over professionalisation experience. It can be argued that the social experience helped the students with constructing their unique social identities, which assisted them in acquiring knowledge informally from others without following strict instructions.

Moreover, studies by Khoza and Manik (2015), and Khoza (2017b) suggest that some master's students enjoyed using digital technologies such as Skype and emails to communicate with their supervisors, when taking on socialisation identities. Nonetheless, they needed to have digital refugee identities in order for them to function accordingly with the use of digital technologies for professionalisation experiences. Digital refugees are people who feel obliged to use digital technologies even though they were not taught how to use such effectively (Coombes, 2009; Khoza & Manik, 2015). Similarly, four postgraduate students of a particular university in South Africa stated that they enjoyed using software such as Vula (which they accessed via their cell phones and laptops) for formal educational content (professionalisation

experience). However, saw Facebook as a social platform on which to be social with their friends, colleagues, and fellow students (Bosch, 2009). Students' enjoyment of digital technology use for professionalisation experiences suggests that they were able to adapt to both their new identities (digital refugee) and the evolving digital technologies. Furthermore, this suggests that students were aware of the digital changes in activities around them, hence treated the use of digital technologies as a process rather than a static system.

In postgraduate studies, there is diversity in the age groups for students enrolled for higher degrees. As a result of this diversity, students who have not been keeping up with the constant digital changes in academia have been carrying the 'digital immigrant' identity. They constantly have to learn how to use new digital technologies even though they were born at a time when such were not in prominent use (Prensky, 2001; Berkup, 2014). Other scholars identify them as the 'X Generation' or 'Digital strangers' as they were born during the 1960s and 1970s (Bejtkovský, 2016; Kamber, 2017). However, students born in a digital age and engaging in new ways of learning involving the use of digital technologies are often referred to as 'digital natives' or the 'Net generation' (Bennett et al., 2008; Prensky, 2001; Tapscott, 1999).

Francis and Harman (2018) conducted a qualitative study which reported that students used social media software such as Facebook and Twitter to plan protests demanding free education and decolonising the curriculum of the higher education of South Africa. Similarly, Mpungose (2019) carried out a study to indicate lecturers' use of Moodle software to decolonise the curriculum of a university module. These findings of both studies indicated that students use digital technology resources (software and hardware) to form decolonial identities in order to meet their personal needs. The decolonial identities consisted of individuals that used digital technologies to address different experiences such as socialisation and personalisation experiences. Initially, Moodle software had been used for professional experiences only.

Moreover, Henderson, Finger, and Selwyn (2016), also carried out a quantitative survey to explore master's students' use of digital technologies for further professional training. Data was generated from 253 master's students across two Australian universities. The findings of

the study indicated that students did not find the universities, LMS useful for learning but preferred digital technologies such as social media instead. They believed that the LMS supported university logistics more than their learning. Similarly, Waycott et al. (2010), used questionnaires and survey methods to show that students preferred the use of open digital technologies such as Web 2.0 to publish their work in sharing (socially) their unique personal identities with others outside the university. Students preferred learning that promoted socialisation experiences. Thus, with the demonstration of students' experiences of using digital technologies mainly for socialisation experiences, roles of other stakeholders are questioned in their experiences of using digital technologies (in a university space). The discussion below elaborates on the roles of academics in using digital technologies.

2.5.4 Academics' roles in using digital technologies

2.5.4.1 Academics' roles in teaching

Academics are other stakeholders using digital technologies for various experiences. On the one hand, studies such as Davis (2007), Davis and Carroll (2009), Orlanda-Ventayen (2018); Özbek (2016); Rolfe (2011) explored lecturers' experiences of using Turnitin for assessments. In common, the findings indicate that lecturers were able to effectively use Turnitin to identify students who plagiarised. This indicates that digital technologies are needed to support teaching and learning and academics have to play the role of introducing these technologies to students.

A survey study by Martins and Ungerer (2015) sampled 314 young (born from 1978 to 2000) and old (born 1946 to 1964) lecturers analysing their experiences of using digital technologies in distance learning at a South African university. Findings of this study reveals that all participants used digital technologies for professionalisation (discuss course instructional issues) and socialisation experiences (informally communicate with students). The younger respondents (digital natives) appreciated and found the use of new and old technologies easy. However, the older lecturers who were digital immigrants experienced difficulties in using and adjusting to the evolving digital technologies in higher education. These findings suggest that the digital natives accommodated the old and the new digital technologies because of their native identity of growing up in a digital period. The older lecturers seemed to struggle because of the lack of exposure to digital technologies for the majority of their lifetime.

Hence, various studies Burnapp (2011); Cummings, Bonk, and Jacobs (2002), and Sharpe, Beetham, and De Freitas (2010) attest that the use of new digital technologies for teaching and learning has become a barrier for many technologically challenged lecturers. However, using 42 lecturers from four different universities in South Africa, Ng'ambi et al. (2016) indicated that, in the first case, lecturers complained that the old digital technologies were limiting and consisted of unclear guidelines and course instructions. During the second case study that involved introducing new digital technologies, lecturers reflected that communication between themselves and students had improved and they could provide suitable support to students. The findings of this study suggest that the new digital technologies might have been user friendly and convenient such that they enhanced the professionalisation experiences of the lecturers.

Additionally, academics may take upon themselves various other roles (such as coordinator, instructor, demonstrator, and facilitator) using digital technologies in teaching and learning. Facilitating has become one of the essential roles academic lecturers need to ensure when using digital technology in teaching and learning. Thomas (2010), explains that an academic becomes a facilitator when managing learning neutrally to assist students in achieving their goals. Similarly, Schwarz (2005) theorises a facilitator as a lecturer who acts neutrally towards students' independent activities. The lecturer assists wherever necessary in order to ensure effective teaching and learning. Essentially, facilitating learning requires teachers and lecturers to use resources that will enable students to interact with them and with one another to allow more freedom and responsibility for their learning (Harden & Crosby, 2000).

Therefore, the introduction of digital technologies in higher education has propelled academic lecturers to use various technologies to facilitate their teaching (Weller & Anderson, 2013). In addition, Goldie (2016) indicates that the successful use of digital technologies in teaching and learning depends on how lecturers use them to facilitate learning. However, Odora and Matoti (2015) question academic lecturers' new roles in teaching and learning with the adoption of digital technologies in higher education. As a result, they conducted a study to explore the role of academic lecturers in using digital technologies for teaching and learning. The study used mixed methods and a descriptive survey to generate data from 86 lecturers of various disciplines at a particular university of technology in South Africa. The findings of the study

revealed that lecturers have access to a wide range of digital technologies but do not use all of them to facilitate learning. Findings also indicate that 48% of the lecturers use digital technologies such as computers to facilitate learning by making use of web pages, multimedia presentations and creating and editing videos and audios to support learning.

Similarly, a study was conducted in Australia to research lecturers' use of digital technologies to facilitate assessment activities. Using surveys and interviews, Waycott et al. (2010) found that lecturers use digital technologies such as Web 2.0 to assess and mark students' collaborative assignments. However, it was also noted that students required immense support with use of Web 2.0 for assessment purposes. Lecturers had to offer great facilitation and guidance regarding posted tasks on Web 2.0. These findings suggest that using digital technologies to facilitate teaching and learning also requires lecturers to ensure they offer support to their students providing feedback about tasks and enhancing all digital activities. In essence, the use of digital technologies for teaching and learning have enhanced lecturers' professionalisation experiences. Studies, Waycott et al. (2010); Odora and Matoti (2015); Ng'ambi et al. (2016); Martins and Ungerer (2015) have provided great detail and evidence of lecturers' new roles as teaching facilitators who use of digital technologies. However, there is still a dearth of studies that capture lecturers' and students' personalisation experience in research-related practices, using digital technologies. This calls for more studies seeking to explore stakeholders' identities in using digital technologies for different experiences.

2.5.4.2 Academics' role in research

Academics also engage in research activities in which they have to use various digital technologies (as a result of moving towards 4IR) to meet scholarly demands in academia. Thus, a researcher can be referred to as a person who engages in intellectual activities such as investigations and exploring academic matters to increase knowledge within disciplines (Harmon, Morgan, Gliner, & Harmon, 1999). Researchers are responsible for engaging with literature, observing phenomena and generating new theories to provide further insights into issues (Arora, Mittal, & Pasari, 2011). Engaging in research may suggest that an academic has to use some digital technologies to produce knowledge. A study conducted by Tsatsou (2015) concluded that researchers use online software resources to share files, collaborate and conduct their studies. Similarly, Costigan (1999) stipulates that researchers employ the use of digital

technologies by retrieving data online and interacting with other scholars' work online through relevant search engines.

A study conducted to review social sciences researchers' use of digital technologies reveals that researchers preferred to use digital surveys rather than postal surveys as digital survey were faster, low cost, and convenient. The study findings also uncover that researchers used web page hyperlinks and Blogs to enhance their research imperatives (Karpf, 2012). Other academic researchers (Amory, 2010, 2011; Bates, 2015; Bosch, 2009; Deng & Tavares, 2013; Francis & Hardman, 2018; Hardman, 2005a, 2005b; Lance, 2007; Madge et al., 2009; Mpungose, 2018) use digital technologies (as instruments) such as videotapes, social media and Learning Management Systems (Moodle) to generate data for their research studies. This suggests that researchers employ the different digital technologies to conduct their research, thus informing their professionalisation experiences.

Tsatsou (2016) argues that the use of digital technologies in research has been rapidly developing over the years, thus greatly transforming research practices. Digital technologies have been considered as 'sites' for research studies (Markham & Baym, 2008). The new and evolving digital technologies informs how researchers generate and analyse data (Gibbs, Friese & Mangabeira, 2002). This digital technology transformation in research practices leads to the belief that various hardware and software resources are used to devise and generate data in research.

Laskowski (2002) conducted a survey study to explore the role of digital technologies in research drawing from both students' and supervisors' perspectives. The study revealed that the use of digital technology in research caused issues between supervisors and students who had different expectations. For instance, students complained that sources to be used were not outlined; and supervisors complained of plagiarism issues. These issues imply that the use of digital technologies is not always a smooth and improved process for both lecturers and students. As evident in this study, both students and supervisors were frustrated by the use of digital technologies in research. More studies should explore the experiences of using digital

technologies in research. New theories can then be forwarded to assist with promoting a less rigorous experience in the use of digital technologies for research purposes.

2.6 Conclusion

This chapter has discussed the experiences of using digital technologies according to socialisation, professionalisation, and personalisation experiences. It has also engaged with the review of the various digital technologies (hardware and software) that are used in education and research. Furthermore, an analysis of theories (ideological-ware) that can be adopted to guide the use of digital technologies in research have also been explored in order to briefly indicate the two theories employed in this study. The chapter also provided a discussion on stakeholders' use of digital technologies in addressing their individual needs. Various communities of practice that form as result of using digital technologies have also been identified and discussed. Lastly, students' identities and academic roles in using digital technologies were discussed, students being stakeholders frequently using hardware and software resources in a university space to address learning, and research requirements. The next chapter aims to address 'what constitutes research in the 4IR' as research practices have been constantly changing owing to the global shift towards the 4IR that involves the use of digital technologies.

CHAPTER THREE

WHAT CONSTITUTES A MASTER'S RESEARCH FOR THE 4TH INDUSTRIAL REVOLUTION (4IR)

3.1 Introduction

The previous chapter has critically explored stakeholders' use of digital technologies for various experiences such as professionalisation, socialisation, and personalisation. It also discussed the types of digital technologies used in research, including hardware, software, and ideological resources (theories). Furthermore, the chapter also explored various literature, forming the first part of the review. This chapter forms the second part of the literature review exploring the array of features found in a research project (dissertation). The chapter focuses on master's students as the main stakeholders that engage with the research. Additionally, this chapter provides details on what constitutes a master's research study in the Fourth Industrial Revolution (4IR), and master's students engaging in research using digital technologies. Engaging in-depth with specific parts of research writing which frame master's students' dissertations is crucial in this study. Thus, the purpose of this chapter is to also provide further insights into the kinds of digital technologies master's students may work with during their research studies. In light of this, the chapter is framed according to the following concepts: masters' students as researchers, research platforms, research activities, and the structure of a master's dissertation.

3.2 Master's students as researchers

The use of digital technologies for research purposes has become a common phenomenon as the world prepares for the 4IR. This digital practice inclines one to explore master's students' experiences of using digital technologies for research purposes. Kaur and Sidhu (2009), comment that master's students are candidates who have graduated from their initial or Honours degrees. They have enrolled in a higher degree that involves engagement in extensive research. Similarly, Heussi (2012) posits that master's students engage in postgraduate research courses that enable them to write dissertations on diverse phenomena. In Chapter Two of this study, scholars Harmon et al. (1999), Arora, Mittal and Pasari (2011), Costigan (1999), and Tsatsou (2015) stipulate that a researcher is a person who generates data using existing

literature and empirical findings. The intention is to provide new information on phenomena as means to gain a greater understanding of issues. In essence, by virtue of enrolling in a master's degree, the students become researchers who explore various issues to add to the existing body of knowledge.

Larcombe and McCosker (2005); Heussi (2012) argue that there has been scant literature on exploring master's students' experiences as postgraduate candidates engaging in research. Ankamah, Akussah, and Adams (2018) narrow down the argument presented by Larcombe and McCosker (2005), indicating that the use of digital technologies (in particular) for masters' research has been receiving very little attention. Likewise, Borgman (2006), Adeagbo, Van Deventer, Asubiojo, and Pienaar (2016) emphasise that in developing countries, very few studies have been noted to explore master's students as researchers using digital technologies for their studies. However, digital technologies play a crucial role in research practices in the 21st century (Meyer & Dutton, 2009). Therefore, the existing accounts indicate that there is low awareness in master's students' experiences of using digital technologies.

Nyahodza and Higgs (2017); Heussi (2012); Khoza and Manik (2015); Ankamah et al. (2018) allude to postgraduate master's students' research experiences needing attention because such students come with diverse digital needs. It has been noted by Nyahodza and Higgs (2017) that postgraduate master's programmes enrol students from various age groups and different backgrounds. A mixed methods study was conducted by Nyahodza and Higgs (2017) to explore the digital division in the experiences of master's students' use of digital technologies for research. The study made use of online questionnaires and interviews to generate data in a particular university in South Africa. Findings of the study indicated that master's students who were older and others from disadvantaged backgrounds struggled with various hardware and software resources for research purposes. The findings also indicated that these students were not confident in their digital literacy skills and failed to complete tasks such as regular examination and keeping up with their academic research using digital technologies. Students experienced difficulties in using digital technologies for their professionalisation experiences. The above findings, therefore, suggest that future studies should explore further the experiences of master's students' in using digital technologies for research in order to complete their

dissertation. Of the many digital technologies, a master’s student can use, the table below maps out some of the common digital resources that may be employed to conduct research studies.

Table 3.1: Table displaying the different digital technologies that master’s students may employ for research

Hardware digital technologies		Software digital technologies		
<i>Professionalisation</i>	<i>Socialisation</i>	<i>Professionalisation</i>	<i>Socialisation</i>	<i>Personalisation</i>
USB	Smartphone	NVivo	WhatsApp	
Computer/ laptop	Tablet	SPSS	Twitter	
Audio recorder		Endnote	Facebook	
Camera		Turnitin	Google	
CD-ROM		Google Scholar	Skype	
Printer		Cloud	YouTube	
Hard- drive		Microsoft Word/Excel/Powerpoint	LinkedIn	
Calculator		e-Library/Books/ Theses		
		Emails		
		Moodle		
		Zoom		
		Microsoft Teams		

Table 3.1 above indicates some of the eminent digital technologies which master’s students may use for their research, extracted from Ankamah et al. (2018), Budden (2017), Czerniewicz et al. (2004), Govender and Khoza (2017), Khoza (2012), Mpungose (2018, 2019b), Nyahodza

and Higgs (2017), and Sokhulu (2020) studies. The digital technologies above are categorised according to their original use, which is either professionalisation (formal), or socialisation (entertainment) experience. However, the question to be asked is which digital technologies do master's students choose to use in their research and why. This study aims to explore and analyse these experiences in order to provide further insight and understanding.

3.3 Research Platforms

Master's students use digital technologies to conduct their research in the 21st century (Meyer & Dutton, 2009). However, they may face the challenge of having insufficient access to essential digital research platforms in which to successfully complete their studies (Symons, 2001). This practice indicates that the use of digital technologies has become relevant for research conducted in preparing for the 4IR. Also, it suggests the need to find out from existing literature, which research platforms master's students have been using over the years for their studies. These experiences may highlight the successes and challenges of the various digital technologies used for research.

Ankamah et al. (2018) conducted a survey study to explore master's students' use of digital technologies in Ghanaian public institutions of higher education. The findings of the study revealed that the use of digital hardware and software resources for research was convenient for 78% of master's students. These digital technologies also afforded students access to a variety of information needed for conducting research studies. The students in this study also attested to the digital technologies such as Ebooks, LiveChats, online databases, computers, Mylibrary and discussion forums being an important component in meeting their research needs. Similarly, Nyahodza and Higgs (2017) outline that master's students also use digital platforms such as e-services or catalogues, the Internet, iPads, e-theses, Digital Academic Literacy software, emails and e-books to help conduct their research projects. There are many digital technologies that master's students can use to support their professional research experience. Some of these digital resources are a provision from the university in which the student has enrolled in, as specified in Ankamah et al. (2018) and Nyahodza and Higgs's (2017) studies. The student's responsibility is to be aware of these digital technologies and utilise them according to their personal research needs.

Daniels, Darch, and De Jager (2010), Rogers (2003), Oblinger and Lippincott (2006), Oblinger (2006), Yao, Liu, and Cai (2009), Ankamah et al. (2018), and Lee-Roberts (2007) have noted that postgraduate students (masters and PhD) are often provided with platforms such as research commons which they can use when conducting their studies. Research commons are platforms fully equipped with high-functioning computers, printing and photocopying machines and other specialised support resources that postgraduate students can utilise for research purposes (Daniels et al., 2010). Research commons in other universities go as far as having librarians that assist master's and PhD students with digital literacy training and other forms of support regarding the use of digital technologies for research (Nyahodza & Higgs, 2017). The use of research commons for master's studies suggests that some universities have initiated relevant platforms exclusive to postgraduate students to help enhance their professional research experiences.

In South Africa, Consortium (2006) discusses that three universities (Universities of Cape Town, KwaZulu-Natal and the Witwatersrand) handed in a proposal to the Carnegie Corporation for funding a project to develop research commons for postgraduate students in all three universities aiding in enhanced research experiences. As a result of this successful development, a study by Daniels et al. (2010) asserted that master's students used research commons to engage in research activities effectively. The findings also showed that the librarians found within the research commons offered immediate support to students in finding relevant databases, search engines, and using specific citation software. The participants further affirmed that the research commons space was sufficiently equipped with digital resources that were efficient in use. In addition, master's students had access to various digital resources that they could use for their studies. Essentially, digital technologies have become an important aspect of master's students' professional courses, allowing them to access data, store information, compile citations and further their research imperatives (Ankamah et al., 2018).

The above studies Daniels et al. (2010), Yao, Liu, and Cai (2009), Ankamah et al. (2018), and Oblinger (2006) have provided extensive research on master's students' experiences of using and accessing different digital resources. However, they did not capture the reasons and

influences that contribute to students' use of digital technologies, which may inform their personalisation experiences.

3.4 Research Activities

3.4.1 Research supervision

Upon registering for a master's degree, a student is expected to perform formal research activities that may involve interacting with various stakeholders, reviewing the literature, collecting and analysing data, to name a few. Symons (2001) enlightens that enrolling in a master's degree means that a student will engage in research on a particular professional area by conducting activities that aim to improve their expertise. Thus, knowledge sharing through supervision activities is inevitable in research that involves the production of master's graduates (van Rensburg, Mayers, & Roets, 2016). Therefore, the research supervision activity should transform master's students into knowledge producers, provided they are given relevant support by their supervisor (Muraraneza, Mtshali, & Mthembu, 2016).

Wisker (2012) suggests that research supervision should empower master's students to become good researchers. Thus, for the supervision process to occur smoothly, Budden (2017) argues that a supervisor should review, comment (on student's written work) and share ideas about research with their master's students in order to successfully complete the project. Similarly, van Rensburg et al. (2016) stipulate that the role of a supervisor is to provide the necessary support, feedback, and constructive supervision that will develop a student. The supervision afforded by a supervisor to a student elaborates on relevant support granted to master's students in order to advance their professionalisation experience. In addition, all these supervision activities can be conducted virtually by the supervisor and student using specific digital technologies. For example, the interaction between the supervisor and a student can also promote the socialisation experience because a supervisor can informally advise the student on research through social software such as WhatsApp (Henry et al., 2016).

3.4.2 Research-related gatherings

As part of master's study research activities, Choy, Delahaye, and Saggars (2015) acknowledge that supervisors have to organise professional supervision meetings, seminars, and cohorts to ensure efficient ways supporting their students. Likewise, Wisker, Robinson, and Shacham (2007) argue that supervisors must initiate innovative developments such as group cohorts, workshops, symposia, and ongoing meetings, to effectively support their students. It then becomes the master's student's responsibility to attend these meetings and cohorts to ensure they receive the support granted to them through these innovative programmes. On the one hand, studies such as those by Waghid (2006), Dennison (2009), and Heussi (2012) on postgraduate student support and supervision, attest that master's students attended meetings set with their supervisors. Most of the support and supervision offered to students was communicated via emails (software resource). On the other hand, Kasi Babu, Vijaya Babu, Bhagyalakshmi, and Kumar (2016) and Throp (2016) conducted studies to evaluate the effectiveness of research seminars on improving postgraduate studies. Similarly, the findings indicated that students were satisfied with learning relevant ways of developing their research projects from seminar platforms. Research seminars, cohorts and meetings are therefore essential components that promote professionalisation experiences for master's students in order to conduct their studies effectively. In the times of COVID-19 pandemic most of these research-related gatherings were offered remotely via digital technologies such as Zoom and other digital platforms (Speirs, 2020; Sokhulu, 2020; Ghani & CMP, 2020).

3.4.3 Research writing

Wolff (2010) identifies that writing a research dissertation is one of the core activities that a master's students' must engage in to complete their study. Pearson and Brew (2002), further substantiate that writing a research dissertation generates meaning and new knowledge; therefore, it is a major part of the research enterprise. In a theoretical study undertaken by van Rensburg et al. (2016) to explore postgraduate students' experiences of writing a dissertation, it was found that master's students were struggling to synthesise and structure their dissertation write-up, particularly with English second language speakers who were challenged the most. Symons (2001) also projected that over 40% of master's students raised concerns about research write-up, many of them being second-language English speakers. Therefore, master's students also find it challenging to write research dissertations especially when English is not

their home language. Most universities require their dissertations to be written in English even when it is not the student's mother tongue (Symons, 2001). It can be argued that effective writing may not be easily achieved when language is a barrier.

Manathunga (2007) asserts that writing a master's dissertation is not a straightforward activity for most students, it is usually an experience accompanied by both successes and challenges. In other studies such as Ahmed, and Mahboob (2016), Botten (2012), Manchishi, Ndhlovu, and Mwanza (2015), San Miguel and Nelson (2007), Magano (2011), Ahern and Manathunga (2004), Badenhorst (2018) and Chen, Wang, and Lee (2016); Bitchener and Basturkmen (2006), master's students complain about the writing process which involves choosing the correct title, proposal, methodology, literature review, purpose of the study, research questions, finding participants, data generation, and discussion. A detailed structure of a master's dissertation should be available to students for their professional dissertation writing experience. In the discussion below a basic structure of a master's dissertation is provided and explained. Relevant digital technologies that students use to find information and conduct their studies are also revealed.

3.5 Structure of a Master's Dissertation

3.5.1 Research title

Symons (2001) draws to our attention that many master's students start their degree with a well-thought-out title, stimulated by their interest or previous experiences. Thus, a title appears on the first page of a master's dissertation, displaying descriptive, precise, and direct details on the study (Tullu, 2019). Dewan and Gupta (2016) and Tullu and Karande (2017) comment that a title should be short, with not more than 15 words; however, some titles can be as long as 208 words. A short title is preferable as it provides precise information about the study without misleading the reader. In addition, the writing style determines the number of words in a title. For example, the American Psychological Association (APA) style promotes 12 words, of which all verbs and nouns start with an uppercase letter (University of KwaZulu-Natal Library, 2015). This format provided by APA suggests that the professionalisation experience is promoted because students have to follow a strictly formal format for their study title.

Dewan and Gupta (2016) further posit that a good title encourages readers to read more about a study. The title refers a clear phenomenon, focus, context, and a transparent indication of participants. A phenomenon is the social issue that interests the researcher the most. It can be experiences, perspectives or reflections on certain occurrences or ideas (Thomas, 2010). Furthermore, all research begins with a phenomenon of interest which should clearly be stipulated in the title of a study (Williams, 2007). Thus, it is in the best interests of the author to clearly indicate a phenomenon to be explored in the master's study title. Additionally, the function of a phenomenon is to generate the literature representing the professionalisation experience in studies. Furthermore, the studies produce facts to indicate professionalisation experience. For instance, a number of studies (Amory, 2010; Kennedy et al., 2008; Hughes & Read, 2018; Waghid & Waghid, 2016) have explored 'students experiences' (phenomenon) of using digital technologies. Similarly, the studies found that students enjoyed doing creative activities for their academic studying, using digital technologies. Other studies Lei (2009), and Kim, Hong and Song (2018) have shown that students use digital technologies (such as Web 2.0) effectively for social activities but struggle to use such for academic purposes.

A focus on a study title emphasises the area of interest the author places attention on (Bavdekar, 2016). In essence, a focus of the study can be any area in which a researcher is inquisitive and is willing to explore to find relevant answers (Hedrick, Bickman, & Rog, 1993). Mpungose (2019b) conducted a study titled "*Is Moodle or WhatsApp the preferred e-learning platform at a South African university? First-year students' experiences*" (p. 1) in which the phenomenon is the '*experiences*' and the focus is identified as the '*Moodle or WhatsApp for e-learning*'. Moreover, the focus produces frameworks that are personally chosen by the researchers for their studies. These personally chosen frameworks suggest the personalisation experience of research.

However, the essential components to be included in a title do not end with a phenomenon and a focus. A research title should also display the context and participants of the study. Therefore, Dewan and Gupta (2016) maintain that a research context is a place in which research occurs. In the example provided above (Mpungose, 2019b), the research context is shown as "*a particular university in South Africa*". Lastly, a research title must also convey the participants

in the study, which are the targeted people who are inquired about in a particular phenomenon (Dewan & Gupta, 2016). *'first year student'* were the participants in Mpungose's (2019b) study. Moreover, participants bring opinions and perspectives that represent certain societies which suggest socialisation experiences. In essence, a good research title will always display the four components, which include, a phenomenon, a focus, a context, and participants in the study.

3.5.2 Abstract

According to Tullu and Karande (2017) an abstract is a short and structured summary of a study, including a brief background, purpose, methods, findings, conclusions and recommendations. Therefore, the methods, findings, and conclusions of an abstract should describe important components of the study (Alexandrov & Hennerici, 2007). Furthermore, Tullu (2019) elaborates that a study abstract should be precise, clear, simple, and should never mislead the reader. Moreover, it should display the key message about the study and be consistent with the main findings (Tullu, 2019). In other words, an abstract should provide the reader with an overview of the study. This overview will inform the reader whether to continue or stop reading the study depending on a common interest.

In addition, Karis (2015) stipulates that an abstract is a short paragraph no longer than 300 words, only including major aspects of the study. The strict restriction of words in an abstract suggests that it promotes a professionalisation experience. Furthermore, Karis (2015), discusses that an abstract should not have any citations or figures, tables, and illustrations. To maintain a good professional experience, master's students need to adhere to the stipulations of an abstract, writing them accordingly in their research dissertations. Essentially, an abstract is a short formal structure that underpins the work of a particular study. It does not draw from any socialisation or personalisation experience but rather from professional writing, which follows strict instructions. The formalisation of an abstract suggests that it is derived from the strengths of professionalisation experiences of writing a research dissertation.

3.5.3 Introduction and Background of a Study

Tullu and Karande (2017) posit that an introduction of a study is a brief and concise section that provides contextual information for a reader to understand the need for the study. Dewan and Gupta (2016) add that the introduction orientates the study providing evidence of a thoroughly researched topic through literature which frames the research. Jha (2014) announces that the introduction only negotiates what has already been said about a topic and does not include conclusions of previous studies. An introduction is the paragraph that provides an overview of the author's area of interest, highlighting what has been said about a particular topic. The introduction informs the reader of the general findings of a phenomenon, and foundationally outlines the context, and organisation of study (Labaree, 2014).

The background of a study is built on the introduction. The background perpetuates ideas about a particular topic but more in depth than an introduction. Labaree (2009) explains that the background of the study contains information that describes the history and nature of a research problem. The background of a problem can be well substantiated in the existing literature which alludes to what has been reported about a particular problem (Labaree, 2009). The background of a study is also informed by the preliminary research around a study's topic, which identifies existing gaps in literature (Jha, 2014). Thus, the background of a study communicates a researcher's interest in exploring a particular phenomenon; and helps the reader understand the importance of a study. Socialisation, professionalisation, or personalisation experiences can stimulate a researcher's interest in a particular topic. Therefore, the background of the study can include any of these experiences as a means of scrutinising the history and nature of a phenomenon.

Two studies Ankamah et al. (2018), and Nyahodza and Higgs (2017) have touched on postgraduate students using various digital technologies such as e-books, Google Scholar, catalogues (software digital technologies), and computers (hardware digital technologies) to attend to their research needs. Students can thus use various digital technologies to retrieve information about the background of their studies. They can also use such to find literature to help form an introduction to their master's dissertation: an introduction and background of the study form part of a master's dissertation research needs. One cannot complete a masters' dissertation without producing an introduction and background of the study.

3.5.4 Research Purpose, Objective and Question(s)

According to Abbas (n.d), a research purpose indicates why the study needs to be conducted, stipulating the overall goal of the research. In interpretivist research, the author should always be neutral when writing the purpose of the study (Abbas, n.d). Moreover, Simon (2011) argues that the research purpose informs the readers about the primary goal of research, thus creating a direction for the study. A research purpose elaborates on what the research will accomplish and is usually constructed in one to three paragraphs. For example, in a study exploring lecturers' reflections on the use of the Curricular Spider Web (CSW) as a transformation strategy, Khoza (2019) stipulated the following purpose:

“The purpose of the study is to explore and understand the lecturers’ reflections on the use of CSW concepts at a South African university where they taught and supervised Master of Education (M.Ed.) in Curriculum Development” (p. 20).

From the above example, Khoza (2019) has revealed the intention and goal of a study he wished to achieve. The use of words such as ‘*explore*’ and ‘*understand*’ represent the main purpose and objective of an interpretive paradigm. As previously mentioned by Simon (2011) and Abbas (n.d), projecting the purpose of a study cannot be overemphasised. Thus, master’s students also must state the purpose of their research studies, making it clear to the reader, what the study intends to explore. In addition, Doody and Bailey (2016) point out that some of the initial steps in developing a research study is to decide on the objectives and key questions. Thus, Lipowski (2008) highlights that research objectives indicate precisely what needs to be done in order to attain the purpose of the study; therefore, objectives must be clear and unambiguous.

Larsen (n.d), further proposes that each research study have specific objectives describing what the research wants to achieve. One of the research objectives stipulated in this present study is “*To explore master’s students’ experiences of using digital technologies*”. Objectives must be closely related to the study title indicating what the study hopes to achieve (Agee, 2009). Therefore, by reading an objective of any study, one should be able to deduce the kind of research (qualitative or quantitative) the study will employ through the keywords used. In this study, the keyword ‘*explore*’ reveals that the study operates under qualitative research.

Furthermore, the strict rules about types of research a study can employ indicates that research structures promote professionalisation experiences that are formal and direct.

Lipowski (2008) sets out that a research question is a logical statement posed about a known phenomenon. A research question is often projected to articulate what a researcher would like to explore; and is also derived from the research topic (Agee, 2009). Research questions are important to answer both qualitative and quantitative research (Vankatesh, 2008). They also guide the kind of methods, number of participants (respondents in quantitative studies), data generation (data collection in quantitative studies) and analysis (Koro-Ljungberg & Hayes, 2010; Lipowski, 2008). Key research questions are central to a study, as the entire research project is conducted to answer the core question(s). However, Agee (2009) notes that emerging researchers (such as master's students) often find it difficult to develop appropriate and relevant research questions. Thabane, Thomas, Ye, and Paul (2009), debate that this difficulty can be addressed by a collaboration between a supervisor and a student. A student can either formally or informally communicate with their supervisor about formulating relevant and concise key research questions. Such will then promote either socialisation or professionalisation experiences to meet the student's personal research needs.

Agee (2009) also presumes that key research questions aim to find answers about perspectives, experiences or narratives apropos of a group of people or a person. Thus, Dlamini (2018) conducted a qualitative case study to explore digital technology practices in South African schools. In his study, he formulated three key research questions:

“To what extent are teachers equipped with the necessary skills and knowledge to integrate ICT in their classrooms?”

To what extent are schools equipped with computing infrastructure?

What are teachers' perceptions towards ICT in their profession?” (p. 2).

According to Zachariah et al. (2009), research questions should be direct and relevant in solving an identified problem. Research questions should not only be descriptive but also be thorough and reflective, asking questions using ‘*what*’ ‘*how*’ and ‘*why*’ as key words (Agee, 2009; Flick, 2018; Zachariah et al., 2009). The ‘*what*’ question requires theoretical concepts in

order for it to be answered (Vankatesh, 2008). The '*what*' question, therefore, substantiates a phenomenon which is descriptive and represents professionalisation experiences.

In addition, in qualitative research, the '*how*' question draws from the social experiences, knowledge, thoughts, and competences of people to solve a research problem and to generate new knowledge (McKay & Marshall, 2001). Thus, the '*how*' is an operational question that explains processes, thus representing the socialisation experience. Agee (2009) stipulates that the '*why*' question aims to generate new knowledge and theories on phenomena. In essence, the '*why*' question is philosophical and seeks to provide reasons and new theories on a particular phenomenon, therefore, representing personalisation experiences. Considering the above example of a study conducted by Dlamini (2018), it is evident that there were three core research questions that using '*what*' key word. This can be informed by the nature of the study. At the master's level of study, students are encouraged to formulate questions that consist of the '*what*' and '*how*' key words within their area of interest.

3.5.5 Literature review (produced by the phenomenon)

A literature review expands on the details about the history, background, complexity and justification of a particular phenomenon (Larsen, n.d). Furthermore, a literature review consists of a critical synthesis of knowledge on a phenomenon to partially address the research questions (Larsen, n.d). Nakano and Muniz Jr (2018) allude to literature reviews that discuss the main concepts of a phenomenon, showing how studies have been conducted from multiple perspectives in order to synthesise and scrutinise existing theoretical data. A literature review is a comprehensive exploration of existing studies that has been conducted over time on a particular topic. Such is undertaken to critically analyse what scholars have studied and projected about a specific phenomenon. Nakano and Muniz Jr (2018), and Winchester and Salji (2016), further substantiate that a literature review provides evidence of changes and gaps in studies conducted about a phenomenon. Such gaps and changes require phases such as planning, summarising, and reporting on relevant topics. A literature review therefore draws strongly on professionalisation experiences, being a step-by-step process that requires one to review contents on a particular topic.

Nakano and Muniz Jr (2018) argue that the creation of knowledge is found in the cycle of exploring, changing, and contesting existing literature. Thus, a researcher must provide a theoretic background of knowledge in which they question, critique, and support arguments as means of contributing to the existing body of knowledge (Boote & Beile, 2005). Additionally, Boote and Beile (2005) and Nakano and Muniz Jr (2018) identify four characteristics (coverage, synthesis, rhetoric and significance) that aid in a sufficient literature review of findings. In their articles they confirm that coverage refers to contents of relevant studies to be presented in a literature review. Synthesis suggests creatively selecting, summarising, and connecting concepts, to provide a new perspective on a literature review (Boote & Beile, 2005; Nakano & Muniz Jr, 2018). The researchers substantiate that rhetoric has to do with organising ideas in a logical, coherent, and systematic way supporting the review. Lastly, Boote and Beile (2005), and Nakano and Muniz Jr (2018) elaborate on the concept of significance which alludes to a review projecting the importance of a study. Steps to follow on how to conduct a literature review effectively are illustrated in the figure below:

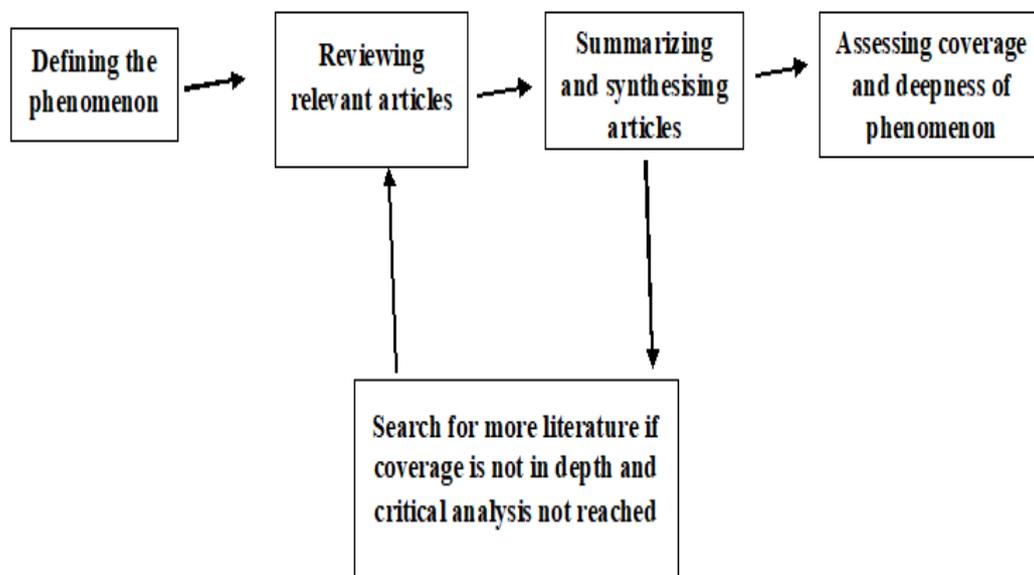


Figure 3.1: Indicating ways of writing a literature review, adapted from Nakano and Muniz Jr (2018).

All postgraduate students (Honours, Master's and PhD) need to write a literature review to find out more about the phenomenon they are exploring (Winchester & Salji, 2016). This literature review activity also allows master's students to develop their research idea to expand an understanding of a specific phenomenon (Winchester & Salji, 2016). Therefore, they have to use specific search engines to access prior research on a phenomenon (Bootie & Beile, 2005). These search engines provide digital access to a variety of sources such as e-books, eLibrary and electronic articles that can be used to construct a literature review. Furthermore, Nakano and Muniz Jr (2018), and Winchester and Salji (2016) assert that master's students can also use software resources such as Google, Google Scholar, EBSCO host, JStor and Science Direct to select relevant academic articles for enriching their literature review development. The above discussion suggests that various digital technologies can be used to retrieve data to make up a literature review.

During the process of developing a literature review, research supervisors should advise students on which papers they can use to retrieve information (Nakano & Muniz Jr, 2018). Also, master's students depend on supervisors' expertise, guidance, and feedback in order to progress with their literature review write-up (Wang & Li, 2011). Therefore, a qualitative case study conducted by Azman, Nor, and Aghwela (2014) found that students and supervisors used digital technologies (Microsoft Word track changes) and formal face-to-face meetings to communicate feedback. Another study undertaken by Labaree (2003) revealed that postgraduate students (Master's and PhD) seek further assistance from faculty advisors, librarians, and other students to help develop their literature writing. Writing a literature review can therefore also be a socialisation experience. A student can interact with their supervisor and other stakeholders regarding ways to improve their writing.

Smagorinsky and Coppock (1995), argue that when researchers synthesise literature, they need to constantly interpret findings in constructing relevant meaning. Ramdhani, Ramdhani, and Amin (2014) extend the argument by saying that the goal for interpreting literature is for the researcher to provide further personal insight into and justification in a particular phenomenon. In this way, personal interpretation of literature can allow a researcher to formulate their own independent arguments. These arguments map out their autonomous and critical thinking that may be used by postgraduate students and academic scholars in the future (Bolderston, 2008).

This individual interpretation of literature promotes personalisation experiences in which researchers can find personal meaning in literature based on a particular interest of study. However, even though writing a literature review can be a social and personal activity, it does not overpower its professionalisation roots of drawing literature from professional research findings which are formally retrieved.

3.5.6 Theoretical framework

Grant and Osanloo (2014) posit that employing a theoretical framework to guide a study cannot be over-emphasised in qualitative research, as it drives the analysis of findings. Grant and Osanloo (2014) further stipulate that a theoretical framework is the basis from which research knowledge is created. This framework aids in supporting the findings from the literature review and findings generated from the actual study. Sunday (2016), adds that theoretical frameworks shape how researchers perceive and understand social phenomena. The above sentiments suggest that a theoretical framework informs one's understanding about a particular topic. This understanding further guides research decisions, such as how master's students interpret and analyse empirical data. In understanding social issues, a theoretical framework therefore promotes socialisation experience. A phenomenon can thus be explored by socially interacting with relevant subjects; and support of a theory can aid in the analysis of the social phenomenon (Sunday, 2016).

Lysaght (2011) postulates that the choice of a theoretical framework reflects a researcher's personal beliefs and understanding about a particular topic. Thus, using such in a study helps frame research by providing a guiding lens according to a specific worldview (Labaree, 2009). Sunday (2016) remarks that a theoretical framework can aid in generating new research derived from a researcher's personal findings and interpretations. From Lysaght's (2011) and Sunday's (2016) understanding, a theoretical framework can reflect the personalisation experience because it projects a researcher's personal lens of viewing issues. Sunday (2016) further argues that theoretical frameworks are not fixed to one substantiation. Instead, they are open to additional developments and revisions, providing more comprehensive explanations for social phenomena. Researchers can extend theories using their personalisation experience, thus contributing to the existing knowledge on a particular theory. For a master's study the

theoretical framework interacts with the research findings to provide understanding and recommendations on a particular topic.

Grant and Osanloo (2014) also observe that the vision and structure of a study are only clear when guided by a particular theoretical framework providing philosophical support for the entire study or dissertation. Govender and Khoza (2017), and Khoza (2016) refer to a theoretical framework as the ideological-ware resource. These researchers argue that such ideological-ware is further explicated by hardware and software digital technologies. Mattar (2018), concurs with Govender and Khoza (2017), by announcing that researchers use search engines such as Google Scholar, databases and websites to find theoretical frameworks relevant to their studies. A master's student can also search for a theoretical framework using multiple technologies such as computers, cell phones, tablets (hardware) and software such as Google Scholar; eLibrary and EBSCO-host, propelled by the movement towards the 4IR. Thus, these technologies can produce varying theoretical frameworks that students can choose from to conduct their studies. Additionally, digital technologies are important resources in supporting research needs such as finding a theoretical framework for one's study.

Theoretical frameworks such as connectivism can be used to study the experiences of using digital technologies in various spheres. Kop and Hill (2008), claim that connectivism is a theoretical framework for the digital age that provides a philosophical lens on understanding how people learn using digital technologies. According to the theory of connectivism, knowledge is vast, therefore can be found in various information networks accessed via numerous digital platforms (Kop & Hill, 2008). Thus, several studies, Lajmiri (2016), Underwood (2016), Bell (2011), and Kropf (2013) have employed connectivism as a theoretical framework to explore students' use of digital technologies for learning. Similarly, the findings indicated that students found digital technologies such as websites, Web 2.0, and social media useful for their academic studying.

Another theoretical framework that has been used in exploring the experiences of using digital technologies includes the Substitution Augmentation Modification Redefinition Theory (SAMR). The SAMR Model is a Framework that is well known for evaluating learning using

digital technologies (Romrell, Kidder, & Wood, 2014). It is a theory used to understand how teachers can enhance learners' learning experiences using digital technologies (Aldosemani, 2019; Portnoy, 2018). A case study conducted by Hilton (2016) employed SAMR as a theoretical framework to explore how digital technologies are integrated by teachers into a social sciences classroom. The findings of the study indicated that teachers found the use of digital technologies beneficial only when combined with traditional foundational learning (included as augmentation and modification).

According to Aldosemani (2019), the SAMR theoretical framework elaborates on 'enhancement' (Substitution and Augmentation) and 'transformation' (Modification and Redefinition) of activities using digital technologies. Other theoretical frameworks such as TPACK also have their own concepts which a researcher has to follow if they choose to employ the theory for their studies. The concepts for TPACK include Technological Knowledge, Pedagogical Knowledge, and Content knowledge to name a few (Bibi & Khan, 2017; Chai et al., 2010; Graham, 2011; Graham et al., 2009; Hammond & Manfra, 2009; Harris & Hofer, 2011; Hilton, 2016; Koehler & Mishra, 2009; Koehler et al., 2013). Following specific concepts found in each theoretical framework supports professionalisation experiences. There are formal key ideas a researcher has to operate under when using a particular theory.

Thus, the above analysis of studies Govender and Khoza (2017); Grant and Osanloo (2014); Labaree (2009); Lysaght (2011); Sunday (2016) has indicated that a theoretical framework can be used to promote three experiences (socialisation, professionalisation, and personalisation) in providing a holistic view of a phenomenon from a researcher's perspective. Also, it is suggested that, for a master's student to attend to their personal research needs (including the use of a theoretical) he or she must be aware of the socialisation and professionalisation experiences that inform their individual research project (personalisation experience).

3.5.7 Research design and methodology

Research design and methodology can be integrated in a study to achieve specific objective(s). Kothari (2004), argues that a research design refers to the prior planning of the different methods that will be used to generate data in a study. Kothari (2004) further highlights that

research designs should be carefully prepared to ensure a successful attainment of research objectives. The preparation of a research design has to be well organised to ensure the generation of adequate and relevant data (Pandey & Pandey, 2015). Moreover, Creswell (1998), and Rajasekar, Philominathan, and Chinnathambi (2006) stress that a research design includes approaches the study will employ to explore the research problem. A research design is the foundational structure that provides information on how the research project will be conducted.

Research design provides an overview of the research process to assist a researcher in organising their study project. A research methodology is more specific to how the research will be carried out (Pandey & Pandey, 2015). Rajasekar, Philominathan, and Chinnathambi (2006) also consider that research methodology provides more information about a research plan, such as specifically explaining how research methods will be used to generate data. Similarly, Igwenagu (2017), and Bricki and Green (2007) identify that research methodology provides systematic methods that will be used by a study to produce data. Kumar (2019), and Thomas (2010) suggest that research methodology operates under a specific design, which further informs relevant procedures and methods to be used for generating data. In other terms, research methodology builds on the plan stipulated by a research design by specifying the approach, paradigm and methods that the study will employ to respond to the objective and research problem.

For instance, there are quantitative and qualitative approaches that researchers can adopt in their studies as methodology. Kothari (2004) and Kumar (2019) articulate that quantitative approaches involves research that produces numerical data that is structured, sequential and fixed to pre-determined measurements. Kumar (2019) further adds that the quantitative approach is based on statistical accuracy, and is usually rigid, employing survey style and questionnaire as a method to produce data. Qualitative approaches refer to research that explores social realities, thus drawing deeply upon people's experiences, perspectives, feelings, beliefs and opinions which are further interpreted by a researcher (Kothari, 2004; Rajasekar et al., 2006). In addition, qualitative research generates textual and in-depth data that aims to explain and understand phenomena (Kumar, 2019). Qualitative approach can use the case study style and interviews, focus groups and observations as methods (Creswell, 2007; Creswell & Creswell, 2017; Golafshani, 2003; Moriarty, 2011). It can be argued that the quantitative

approach operates from the professionalisation experience because of the fixed measurements it engages in research. On the contrary, the qualitative approach explores socialisation experiences that draw from participants' realities which are not pre-determined but based on interactive processes and conversations with people.

According to Rajasekar et al (2006), survey research style supports quantitative approaches as it measures the amount and generates data using a set of numbers and statistics. Moreover, Ponto (2015) articulates that surveys use questionnaires with fixed questions to ensure production of quantitative data that can be used for generalisation. According to Ponto (2015), surveys are completed by a greater number of people in order to generalise findings. The above discussion highlights how survey research style can be aligned with the quantitative approach which master's students have situated in the statistical worldview (Mathematics, Sciences, and Economics) to conduct their studies.

Other master's students that belong in the humanities who wish to generate thorough and in-depth studies can use the case study research style which is an example of qualitative approaches (Burkhardt, 2001). Rajasekar et al (2006) impress that a case study research is descriptive and uses texts to provide reasoning and understanding about a particular phenomenon. Case studies are exploratory in nature and offer answers to 'how' and 'why' questions, which cannot be obtained in numerical findings (Rajasekar et al., 2006). A case study also provides an in-depth and holistic understanding of issues derived from people's social realities (Kumar, 2019). Therefore, case studies maintain socialisation experiences, being a good example of qualitative research. Also, the presence of 'how' and 'why' questions imply thorough elaboration of concepts that can be generated through social interactions with people.

Research methods are used to generate data in both qualitative and quantitative approaches. Kothari (2019); Rajasekar et al (2006), and Williams (2007) stipulate that research methods refer to the various instruments that are used to generate data that will uncover knowledge about a particular topic. For example, a researcher operating under quantitative research may use questionnaires as a method of gathering relevant information. Questionnaires are described

by Mack (2005) as a method in which a researcher formulates closed-ended questions, which are in the same fixed order to categorise responses numerically. The questionnaire method allows a researcher to make meaningful comparisons against categorised responses to generate numerical data (Mack, 2005). Other quantitative methods include polls and computational techniques (Labaree, 2009). Methods used in qualitative research include unstructured interviews whereby a researcher can formulate open-ended questions (Gill, Stewart, Treasure, & Chadwick, 2008). The open-ended questions allow participants to expand their responses without any limitations (Gill et al., 2008). The qualitative approach also includes research methods such as focus groups, observations and reflective journals (Hammarberg, Kirkman, & de Lacey, 2016; Walliman, 2017).

Essentially, master's students need to find ways in which to obtain relevant information about which research approach, style, and methods to use for their studies. Thus, Harwood and Petric (2019) conducted a qualitative study to explore how master's students retrieve information about research methodology during a master's course in a university in London. The findings of the study reflected that students communicated with their supervisors through emails to gain feedback on the methodologies used in their studies. The findings of this study have two implications. On the one hand, the formal interaction through emails to inquire about an academic study indicates the application of the professionalisation experience between a supervisor and a student. On the other hand, the study also suggests that students can use digital technologies to retrieve information on research methodology. In this instance, it was emails (software resource) under the guidance of a supervisor. However, students can also deploy research methodologies using other digital software search engines such as Google Scholar, Semantic Scholar, Microsoft Academic, CORE, Science.gov, ERIC and Baidu Scholar (Research and Writing Guides, n.d). Other online software resources include Educational Resources Information Center (ERIC), ResearchGate and Wikipedia (Student Resources, 2017) .

Master's students must also consider the research paradigm which their study will employ to guide their worldview and perception in generating and interpreting data. According to Kivunja and Kuyini (2017), a research paradigm is a philosophical worldview or school of thought that informs the meaning, reasoning, and interpretation of phenomena derived from research data.

Lather (1986), agrees that paradigms reflect a researcher's beliefs about issues occurring around the world. Kivunja and Kuyini (2017) further stipulate that a research paradigm includes the positivist (quantitative), interpretivist, critical (qualitative), and pragmatic (both qualitative and quantitative). Therefore, each paradigm can be aligned with a particular research approach. Moreover, each paradigm upholds specific understanding according to ontological and epistemological assumptions (Guba & Lincoln, 1994). Thus, ontology concerns how phenomena are perceived in reality. Ontology provides the nature of reality about social issues (Kivunja & Kuyini, 2017). Epistemology refers to the description of knowledge according to what counts as true and valid about specific topics (Cooksey & McDonald, 2011). This knowledge can be communicated to other people through certain procedures such as research publication (Kivunja & Kuyini, 2017). Ontology thus promotes socialisation experiences because it explores participants' social realities. However, epistemology addresses professionalisation experiences. It is specific to the formal and validated knowledge which follows particular processes.

3.5.8 Presentation of research findings and data analysis

Research findings elaborate on the data that was generated empirically in a study. The findings must be negotiated logically and explicitly (Labaree, 2013). For qualitative research, the research findings are presented descriptively, and for quantitative research the findings are presented numerically using statistics, tables and signs (Labaree, 2009). The findings of a study must also relate to the key research question that the study initially posed (Govender, 2007). The research findings must answer the key research questions. Rajasekar et al. (2006) add that research findings include the researcher's voice and interpretations, drawing implications from empirical findings, and linking them with literature and the theoretical framework. This part of a dissertation also indicates a researcher's originality. It promotes personalisation because it provides the researcher's new insights and understanding of the explored phenomenon.

The discussion of research findings communicates with the contents of a literature review that highlighted what was already known about a research problem (Labaree, 2013). Similarly, Chaudhari (2017), and Rajasekar et al. (2006) emphasise that the discussion of data findings should relate to prior research and theories: the researcher can then be able to make meaningful analysis. Linking the findings with literature serves as an advancement of understanding about

the topic in relation to what has already been discussed (Labaree, 2013). The constant link of research findings to literature indicates the professionalisation experience: a literature review provides a systematic dissemination of knowledge embedded in specific worldviews. Furthermore, research findings are displayed in a computer (hardware resource)- a researcher can constantly interact with the data to construct meaning and understanding (Harwood & Petric, 2019).

Data analysis is also one of the important aspects of research writing. Master's students analyse data after they have generated it from their participants. According to LeCompte and Schensul (1999), data analysis involves reducing large amounts of data to a comprehensive amount in order to make sense of it. Additionally, Kawulich (2004) argues that analysing data in qualitative research involves becoming familiar with the data so that one is able to identify patterns, themes, and relationships thus making interpretations and understanding findings. Data analysis thus occurs immediately after data has been generated from the field (LeCompte, 2000). Also, data analysis may require researchers to use certain resources to interact with the data. There are digital technologies created for researchers to assist them with the analysis of findings. Nearly all domains are affected by the use of digital technologies. It is therefore necessary to have relevant technological resources for conducting data analysis (Lambrechts, Lourens, Millar, & Sparks, 2011).

Researchers have been looking for 'easy to learn' digital software to aid in the data analysis process (Lambrechts, Lourens, Millar, & Sparks, 2011). Thus, many universities that offer higher degree qualifications for research have developed digital software resources for sorting and analysing large amounts of data (Zdenka, Petr, & Radek, 2011). According to Davidson, Thompson, and Harris (2017), research data analysis software started developing in the 1980s in universities based in Germany, North America, and Australia to make analysing data efficient. Evers, Silver, Mruck, and Peeters (2011), acknowledge that, over the years there, existing software resources such as Qualitative Data Analysis Software (QDAS) has aided the data analysis process by creating codes for data, adding conceptual labels and creating patterns derived from data. Evers et al. (2011) add that other qualitative data analysis software such as Transana and Wirelan, focus on analysing both visual and audio data. Cassandre and Hyperresearch software focus on analysing textual data.

Exploring researchers' experiences of using qualitative data analysis software, Evers et al. (2011) study highlighted that researchers used QDAS to analyse data, influenced by their professional, cultural, theoretical and personal backgrounds. Researchers can use a data analysis software drawn from the strengths of either professionalisation (following systematic instructions of how to use the software) or personalisation (how they have personally experienced other similar digital technologies) experiences. These experiences may lead researchers to either master or struggle with digital software technologies. For instance, the researchers in Evers et al. (2011) qualitative study, had trouble using data analysis software other than QDAS only being familiar with QDAS software.

NVivo is also a qualitative data analysis software that assists with sorting and matching data to answer initial research question(s) (Bazeley & Jackson, 2013). Zamawe (2015) postulates that NVivo is one of the more popularly used qualitative data analysis software in Southern Africa in which this current study is located. The NVivo software was specifically developed for qualitative research, to support researchers in numerous ways of analysing textual and complex data. These ways include accessing, recording, and organising data (Lakeman, 2009). NVivo allows researchers to search for specific phrases from data, creating figures and themes relevant to data findings (Blaney, Filer, & Lyon, 2014). With the use of NVivo, researchers can organise and display their rich data according to dynamic documents offered by the software (Ozkan, 2004). For the purpose of this study, NVivo software is discussed in detail because it is used for analysing data in Chapters Six and Seven. Nvivo software has gained prominence over the years as the most used qualitative data analysis software.

Ozkan (2004) also notes that understanding NVivo concepts such as memos, nodes, coding, and developing graphic features of the software may be difficult and time-consuming for some researchers. Similarly, two other studies- Blaney et al. (2014), and Welsh (2002) have projected that using Nvivo alone is complex. Therefore, it takes time to understand the terminology and functionality of the software. The findings of these studies shows that qualitative researchers worked best when using NVivo in combination with manual coding to ensure the accuracy of themes and codes. Therefore, Blaney et al. (2014) and Welsh (2002) recommend that NVivo be used in combination with manual data analysis. Zamawe (2015) identifies the positive

experiences of using NVivo software in that NVivo allows researchers to be creative about their findings. In his study, he discusses the implications of using NVivo software in qualitative data. Zamawe (2015) argues that NVivo helped him relieve the burden of manually coding ten in-depth interview transcripts and five audio files. The researcher found that, NVivo provided him with an opportunity to make creative nodes that accommodated relevant data excerpts. This made it easier to identify themes or patterns within interview and audio-file data.

While there is data analysis software for qualitative research, there is also similar software for quantitative studies (Evers et al., 2011). Such software include QDA Miner and Statistical Package for the Social Sciences software (SPSS), to name only two. QDA and SPSS are often used to create codes and provide rigorous statistical findings for survey research (Jones, 2007). Dohan and Sanchez-Jankowski (1998) declare that SPSS provides logic based on a positivist worldview, with objectivity facilitating the statistical analysis. SPSS also uses Microsoft Excel to manage and interpret survey data, making it easier for the researcher to work with findings, and shortening the timeframe for data analysis (Jones, 2007). Over the recent years, SPSS has also been greatly used as a data analysis software for quantitative research (Arkkelin, 2014).

According to Landau and Everitt (2003), SPSS assists researchers and postgraduate students in social and behavioural sciences to analyse statistical data. Thus, SPSS contains mathematic formulae that carry out analysis on numerical data (Landau & Everitt, 2003). Furthermore, the SPSS software enables researchers to create graphs, tables, and variables generated from the numerical study findings (Arkkelin, 2014). The SPSS software also indicates relationships between variables categorised according to mean, median, or mode. Such are mathematical measures that can be organised on a spreadsheet (Greasley, 2007). The way in which SPSS analyses data indicates its similarity in function to NVivo. Both software types help researchers organise their findings by creating folders that sort the data. However, they are different in that NVivo is highly descriptive and navigates using textual information; while SPSS can only accommodate statistical data for analysis. Data analysis software can be employed in any study as an aid to analysing findings. The software should be used appropriately, following the guides and tutorials provided online and by universities for each software types (Landau & Everitt, 2003).

Lambrechts et al. (2011) also suggest that postgraduate students and researchers be provided with support and monitoring by the Information Technology (IT) department in all universities to ensure the intended use of data analysis software. Moreover, Lakeman (2009) notes that data analysis software comes with instruction books and a range of textual and multimedia tutorials complete with rich information on how to use them. This formal training on using software reminds that knowing how to use certain digital technologies is accommodated in the professionalisation experience- users have to follow specific instructions on how to use the software. However, researchers are not limited to only retrieving training professionally; they can also seek how to use the software by socially engaging with people who are familiar with the programme to address their personalisation research needs.

3.5.9 Research conclusion and recommendations

Rajasekar et al. (2006) posit that a research conclusion involves a synthesis of the findings and it is the part of the dissertation in which a researcher emphasises the study findings and ideas. For a conclusion, a researcher can also briefly highlight other important aspects included in the study, such as theoretical perspectives, research questions, and methodologies used (Rajasekar et al., 2006). Lynch (2014), further explains that a conclusion refers to the study's main argument, reminds readers about findings from the literature review, and evaluates the researcher's interpretations. A research conclusion provides an overview of a study driven by the author's unique findings. A study conclusion thus draws strongly on the personalisation experience, the researcher's unique findings being revisited and summarised. All chapters in a master's dissertation include a conclusion. However, this section focuses on the conclusion written at the end of the entire research dissertation.

After synthesising the key ideas about a study, a researcher must provide new recommendations for future practice and research (Labaree, 2013). Similarly, Lynch (2014) claims that recommendations consist of ideas of what might occur in the future as implied by the findings of a particular study. Therefore, master's students must provide relevant recommendations based on their research findings and conclusions. For example, a study conducted by Mpungose (2019b) to explore the use of WhatsApp and Moodle for formal learning. It was found that students were more familiar with the WhatsApp software. The study then recommended that universities employ the use of social software platforms such as

WhatsApp to supplement the formal learning platforms such as Moodle. Thus, recommendations suggested by studies can be considered by relevant organisations in order to bring about adaptations in affected contexts.

3.6 Conclusion

This chapter formed the second part of the study's literature review which was specific to research for master's students. The first part of the literature review explored the experiences of using digital technology within various organisations broadly. The discussion was narrowed to education, teaching, learning, and research. This review presented the multiple duties allocated to various stakeholders regarding experiences of using digital technologies in education and research. This chapter has reviewed the role of master's students as researchers. Under this chapter, various studies indicated the scarcity of research in postgraduate research experiences. Furthermore, it was found that, by virtue of enrolling for a postgraduate degree in research, master's students become novice researchers in the academic field. The chapter also explored the various kinds of digital research platforms that master's students can access when participating in research in the 21st century. Platforms involve the use of digital technologies as part of the 4IR movement and COVID-19 pandemic. In addition, research activities that master's students engage in during their studies were discussed. Hence, the supervision process, formal research activities, and writing of the dissertation were some of the activities that were discussed. Lastly, what constitutes a structure of a master's dissertation was reviewed. This section explored components such as the study title, abstract, introduction, and background of a study, research purpose, objectives and questions, literature review, research design and methodology, research findings, and data analysis, conclusion, and recommendations. The following chapter reports on the theoretical framing of this study which discusses two main frameworks including CHAT and UTAUT.

CHAPTER FOUR

THEORETICAL AND CONCEPTUAL FRAMING OF THE STUDY

4.1 Introduction

Universities have employed the use of digital technologies for the purposes of teaching, learning and research. Thus, the previous chapter expanded on the literature review from chapter two by providing further insight into how research is executed by master's students in support of the Fourth Industrial Revolution (4IR) movement. The previous chapter also provided discussions on activities that master's students engage in when doing their research projects using digital technologies. Furthermore, chapter three has provided a structure of a master's dissertation which students may follow when they engage in the research write-up. This includes the study title, literature review and methodology to name a few. This chapter provides an extensive discussion on the theoretical (CHAT) and conceptual (UTAUT) framing of this study. Specific concepts within CHAT are explored in order to develop an in-depth understanding about the theory in relation to this study.

The UTAUT is used as a secondary conceptual framework interrogating people's beliefs and acceptance in using digital technologies. Four UTAUT factors that contribute to people's belief and acceptance of digital technology are thoroughly discussed in relation to master's students' experiences of using digital technologies. After engaging with various theories such as TPACK, CoPT, and EET, both CHAT and UTAUT were found most suitable for this study because they are powerful tools for analysing people's engagement with digital technologies. The first half of this chapter elaborates on the background of CHAT, the concept of an 'activity', the historical and cultural understanding of doing activities and lastly, it theorises on the key concepts of CHAT in relation to this study. The second half discusses UTAUT as a conceptual framework used in this study. It also negotiates the background of UTAUT and its key constructs relative to this study. The chapter concludes by generating a new analytical framework (derived from concepts of CHAT and UTAUT) that is used to analyse and theorise on the study findings in Chapters Six and Eight.

4.2 The CHAT theory uncovered

4.2.1 Background of the CHAT theory

The Cultural Historical Activity Theory (CHAT) was founded by Russian psychologist and scholar Lev Vygotsky. Austin, Orcutt, and Rosso (2001), posit that Vygotsky (1978) expanded on Piaget's (1964) developmental theory of cognitive learning, but included the idea of socio-cultural cognition. Lev Vygotsky discusses that mental consciousness is mediated by social and cultural activities that have evolved historically through the use of various tools (Igira & Gregory, 2009; Yamagata-Lynch, 2010). Thus, CHAT is a descriptive theory that offers guidance on how humans can use tools in order to participate in various activities that may inform learning (Gretschel et al., 2015). The learning occurs in a social and cultural context: Vygotsky (1978) conceptualised this as the first generation of CHAT. Vygotsky (1978) further elaborated that people use cultural tools to socially engage in activities to achieve particular goals. Vygotsky (1978) expressed his ideas of the first generation of CHAT in a triangular format that includes actors, tools, and object (goals) illustrated in the figure below:

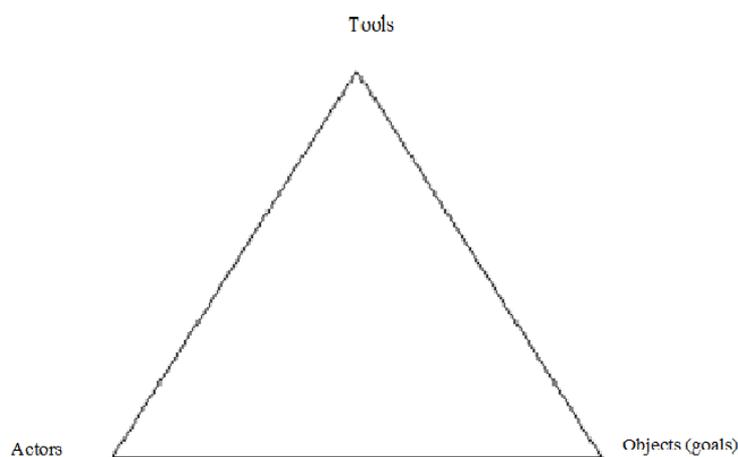


Figure 4.1: The Vygotsky (1978) first generation of CHAT, adapted from Engeström (1999)

Vygotsky (1978) elaborated on CHAT at a level in which activities are a means of attaining specific goals. However, Igira and Gregory (2009) argue that, in the first generation of CHAT,

Lev Vygotsky analysed the engagement of activities using tools from an individual perspective (actor); thus, neglecting the collective integration of activities as a community. As a result of this gap, Leont'ev (1978), extended the CHAT framework to include the second generation activity system which involves other components that are included in an activity system. Activity systems are collective activities by actors and other community members having different roles and duties in a cultural and historical setting (Foot, 2014). Aleksei Leont'ev a psychologist and student of Vygotsky, stipulated that human social activities can also be scrutinised at the macro level of a collective community (Engeström, 1999; Leont'ev, 1978). Thus, Leont'ev conceptualised the second-generation CHAT as involving people with a shared goal who interact with tools in dynamic activities to achieve the specific goal within a community (Igira & Gregory, 2009). This second-generation expansion of CHAT resulted in the addition of the community, rules and division of labour concepts (to be discussed later) which aimed at understanding the collective activity by people with similar goals (Kuutti, 1996). Nonetheless, Igira and Gregory (2009) point out that the second generation of CHAT only emphasised the 'what' and the 'who' side of an activity, not giving great detail. More expansion is thus needed to address the 'why' part of engaging in activities involving various tools.

Engeström (1987) extended CHAT to form the third generation of the theory developed to understand multiple perspectives of completing activities using varying tools. In addition, Engeström extended CHAT by further conceptualising on components such as community, division of labour and rules negotiated by Aleksei Leont'ev to support social learning formed by relationships between activity systems (Kuutti, 1996). Engeström (1987) was the third scholar to develop CHAT extensively to include the lower part of the CHAT triangle providing in-depth understanding and functioning of all six concepts, and named the revolving multiple activity systems (Hashim & Jones, 2007).

Engeström (1987) also considered the context in which the activity system occurs and postulated that multiple activity systems trigger contradictions within actors in order to bring about change in functionality of these systems (Engeström, 2001). Thus, through constant social interactions, actors struggle with contradictions that drive them to modify and build their activities using different tools to transform their experiences (Nardi, 1996). In the context of

this study, the contradictions may occur when master's students use various digital technologies (tools) to generate literature findings. These findings consist of ideas on their phenomenon, which may be debated to inform new understanding projected in their research writing (activity). The digital technologies a student can use to generate literature may cause contradictions for new understanding to occur. Such technologies include Google Scholar, EbscoHost and other software resources. Altogether, the third generation of CHAT aids in understanding human activities by addressing 'what' activity is being conducted, 'how' is it conducted, and 'why' is it being conducted (Gretschel et al., 2015; Hasan & Kazlauskas, 2014; Igira & Gregory, 2009). The figure below represents Engeström's (1987) development of the third generation of CHAT which this study has employed.

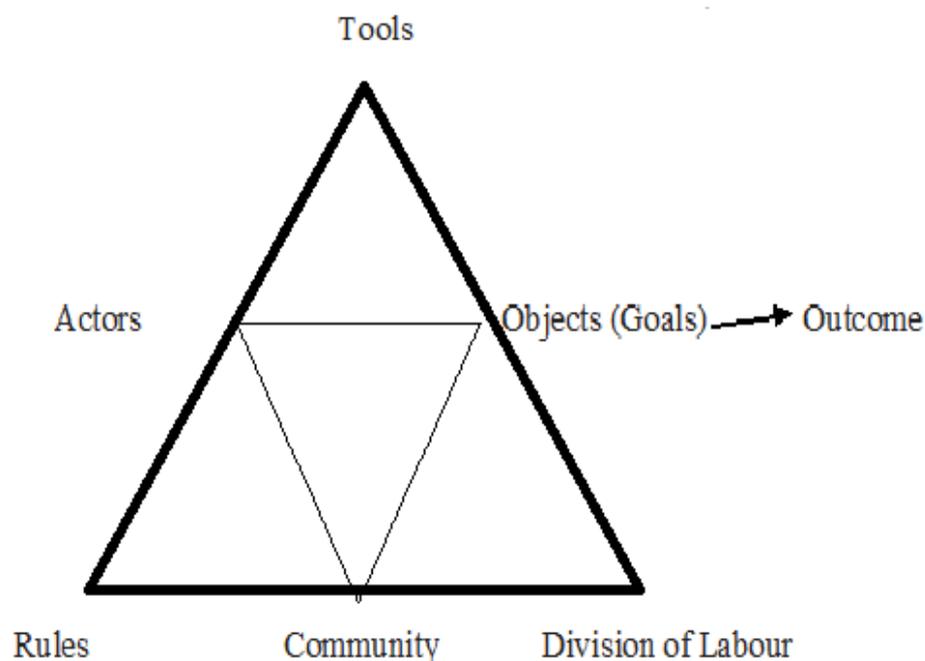


Figure 4.2: CHAT framework, adapted from (Engeström, 2001)

The third generation of CHAT provides a holistic presentation of the activity systems, fully developed to include actors, tools, rules, community, division of labour and objects. In addition, all concepts in CHAT have a relationship with one another, as shown in Figure 4.2 above. In the upper part of the main triangle, actors undertake an activity motivated by objects (goals) in a process mediated by tools, in order to attain an outcome (Gretschel et al., 2015). Furthermore, the lower part of the triangle (negotiated by Engeström) indicates how activities of the actors are influenced by their historical and cultural factors, including rules and division of labour in a context and community in which activities occur (Gretschel et al., 2015). The arrow in Figure 4.2 points to the relationship between objectives and outcomes concepts of CHAT.

According Mezirow (1997) CHAT is significant in providing a framework for understanding how digital technologies are used in various organisations. Lim (2002) argues that CHAT can be used to explore the experiences of using digital technologies in education and research. In universities, students use digital technologies to address their academic needs such as completing assignments and conducting research studies (Wang, 2007). For the purpose of this study, CHAT is used as a guiding lens to analyse master's students' experiences according to the types of digital technologies they used for research (what), and ways in which these digital technologies were used to address their personalisation experiences of research needs (how). Moreover, in this study, CHAT is used to scrutinise the rationale behind the use of these digital technologies for research (why). The decision to employ the CHAT theory in this study was based on its concepts as an analytical framework. Such can assist in understanding the use of digital technologies by postgraduate master's students involved in this study. The framework helped in the understanding of experiences of using digital technologies in master's students' research as informed by professionalisation, socialisation, and personalisation experiences.

4.2.2 An activity, the centre of analysis

According Nardi (1996), the unit of analysis in CHAT is the activity itself. Thus, the concept 'activity' refers to people's various actions towards an object (goal) in a socio-cultural and historical context (Yamazumi, 2006). Similarly, Gretschel et al. (2015) point out that activity involves action mediated by tools that people use to achieve a particular goal(s). In addition, activity is facilitated by the social actions between people and various tools (Kaptelinin, Kuutti, & Bannon, n.d). Furthermore, these actions can be influenced by culture and history, which

unravel the variety of experiences people go through, even when engaging in the same activity (Gretschel et al., 2015). Yamagata-Lynch (2010) and Kuutti (1996), also argue that activities are not static systems but are dynamic and continuous because they are influenced by varying cultures, contexts and history. This discussion suggests that an activity is affected by an individual's culture and history of performing specific duties which are embedded in their personal identities. Thus, personalisation experiences are exposed when people engage in the same activity but in different ways.

In CHAT, the main idea is for the activity to generate a transformed outcome for the actors (Battista, 2017; Koszalka & Wu, 2004). Similarly, Kuutti (1996) postulates that the existence of an activity is motivated by the purpose of transforming an object (goal) into the desired outcome. To ensure this transformation, the people participating in the activity must use various tools to transform their actions (Yamagata-Lynch, 2010). The tools such as artefacts, instruments, machines and digital technologies are important features in activities and have a mediating role that they carry (Kuutti, 1996). Likewise, Koszalka and Wu (2004); Battista (2017) identify that tools include the various artefacts or gadgets that people use to engage in their activities in order to achieve specific goals. Tools become part of the activity process enabling people to interact with one another and their activity to transform their goals into outcomes. In this study, master's students use digital technologies such as computers, Google Scholar, Turnitin, Endnote, NVivo, Microsoft, Outlook and Gmail (tools) to participate in research (activity) in order to complete a dissertation (goal) and graduate with a Master of Education (M.Ed.) degree (outcome).

A theoretical study conducted by Roth and Lee (2007) note that human activities explored within CHAT are mediated in society, and are found in education and social psychology. Kuutti (1996) also argues that the context in which the activity occurs is important in understanding participants' experiences. Equally, Koszalka and Wu (2004) elaborate that activities are affected by the context in which the participants are found. The current study is located in the context of education and research. It is also based in a South African institution of higher learning. Master's students at this institution are enrolled in research studies. In this context, their experiences of using various digital technologies for research purposes are explored to provide in-depth insight and theorisation. Human social learning based on

particular activities requires interaction with realities that are developed in specific contexts (Kaptelinin et al., n.d ; Nussbaumer, 2012).

Also, the concept ‘activity’ was explicitly discussed in the second generation of CHAT in understanding human social learning in relation to the motive (of the activity) and the attainment of goals. Kuutti (1996) discusses that activities are a process that can be broken down into relational levels, thus understanding how the goals can be transformed into outcomes. This process is emphasised by CHAT because of the significance of developmental transformation found in human activities (Kaptelinin et al., n.d). The figure below provides an outline of an activity process as negotiated in CHAT.

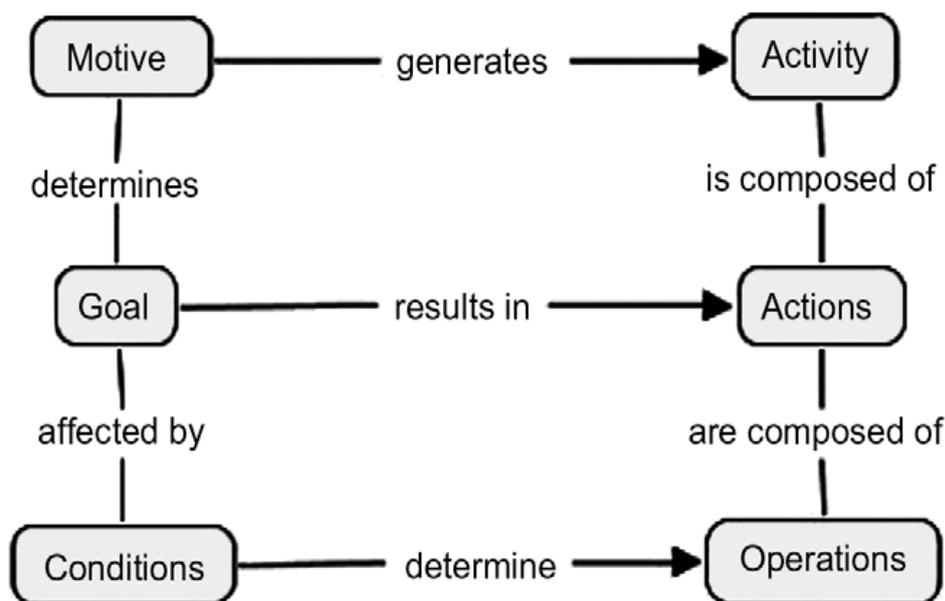


Figure 4.3: CHAT activity process according to relational levels, extracted from Nussbaumer (2012, p.39)

The above Figure 4.3 projects that all activities are driven by particular motives which further stimulate action(s) that aim at achieving specific goals. Thus, all actions relate to the overall goal. The attainment of the goal depends on the conditions the activity is exposed to (Leont’ev, 1978). In this study, master’s students have their own personal drive/motive and rationale for conducting their research studies. The overall goal is to write a master’s dissertation and to

complete the M.Ed. degree (outcome). Moreover, as previously discussed by studies of Bates (2015), Kennedy et al (2008), Khoza (2017a), and Mpungose (2018, 2019b) in chapter two, institutions of higher education have employed the use of digital technologies for teaching, learning and research; thus, master's students' abilities (actions) to use these technologies are diverse (conditions). Therefore, the attainment of their goal depends on their ability to use these digital technologies efficiently in research (activity).

Furthermore, the actions promoted by a particular activity consist of operations which are well-defined routines used by the subconscious mind to respond to conditions encountered during the action performance (Roth, 2007). During the initial stages of an activity, each operation is consciously recognised by a person's mind. When, however, the action is routinely practised overtime, it becomes fluently and subconsciously performed (Engeström, 1999). In other words, the operations are the subconscious 'doings' that continuously occur due to the context or condition an actor is exposed to during an activity. The routines are drawn from the personal familiarity of the use of tools that mediate an activity (Kaptelinin et al., n.d). This familiar usage of tools can be derived from socialisation or professionalisation experiences that inform individual needs. In the context of this study, during the early stages of dissertation writing, master's students could consciously use digital technologies. However, as they gain experience with the use of digital technologies, they may become more effective because their subconscious minds have stored the routine use of different digital technologies when conducting research. For students who have previously been exposed to digital technologies for formal learning, this process might accommodate the new technologies used at master's level (if any). As Engeström (1999) explains that new actions (with unfamiliar digital technologies) create a broader scope of achieving activities (research) which contains new operations that further influence the subconscious mind. To become more skilled at a particular activity, operations must be continuously developed to broaden the horizon of competence in engagement (Hashim & Jones, 2007).

This operational level of practising of engaging in research promotes a personalisation experience that informs individual research needs. The conscious and subconscious mental processes may occur at different stages of dissertation writing for each person. The development of digital skills may differ according to each master's student.

4.3 Cultural and historical understanding of tools and activities

According to Engeström, Miettinen, and Punamäki (1999), activity systems are central to human culture and history. This is why the same activity can be done differently by various people, according to their personalisation experience as informed by their cultural and historical background (Kuutti, 1996). This ideology of history and culture influencing activities has been briefly highlighted in the above sections. Thus, this section provides further insight into how culture and history can inform activity practices.

Engeström et al. (1999) assert that culture is always present in the way that tools mediate human activities. This culture is revealed in the way in which a group of people use tools for their current activities (Sannino & Engeström, 2018). The accumulation of culture behind an activity may either be over a short or long period of time (Engeström et al., 1999). In essence, culture influences the way people use tools for different activities from practices accumulated over time. For master's students, how they use digital technologies to address their professionalisation experiences (research activities) is determined by the culture they have been exposed to in using these technologies. For example, if a student has been using WhatsApp software to informally communicate research contents with their supervisor and colleagues during their Honours study, they may continue to do so even for their master's study. It has become cultural for them to use WhatsApp for academic purposes even though it was not historically designed for such.

The 'history' concept discusses people's historical influences on their actions, and how history shapes the way people think and act (Gretschel et al., 2015). There are historical contexts found in every activity, central to human experiences (Engeström et al., 1999). Thus, according to CHAT, all activities need an understanding of a person's history which can be derived from the community in which they are found (Koszalka & Wu, 2004). This history can also help scrutinise and understand why individuals use tools the way that they do. In addition, tools and activities have histories of their own. How a tool has been used previously remains embedded in the tool as it continues to develop (Kuutti, 1996). Thus, the historical analysis of tools and actors (people who use tools) remains important in understanding how they shape current activities (Cole & Engeström, 1993). To expand on the WhatsApp example provided in the above paragraph, students may also use WhatsApp for socialisation experiences. They communicate with their colleagues and loved ones because that is what the software was

historically developed for (social interaction) (Mpungose, 2019b). With the recent demands of communication required for learning and research, WhatsApp is currently being used for professionalisation experiences. However, its historical background cannot be ignored (Annamalai, 2019). The cultural and historical understanding of tools plays a vital role in demystifying people's diverse experiences in undertaking activities (Koszalka & Wu, 2004; Roth, 2007). These 'cultural-historical' influences can be subconsciously accommodated in a person's cognition, resulting in routine use of tools as discussed by Roth and Lee (2007), Engeström (1999), and Roth (2007).

Digital technologies have revolutionised education and research practices; therefore postgraduate students can now use their smart phones for research purposes (Onaolapo & Oyewole, 2018). As a result of this revolution, master's students possessing a smartphone can use it to record participants if they are conducting studies that require them to audio-tape interviews. In other words, they would have applied the culture of recording conversations via their phones onto research activities as means of obtaining data in order to meet their individual research needs.

It can be argued that there is a link between cognitive processes, the culture and the history of doing things according to individuals' personal needs (Hashim & Jones, 2007). Furthermore, Hardman (2008), asserts that the culture and history of tools can be changed during the execution of activities. The change in historical and cultural use of tools is stimulated by the internal contradictions that occur to individuals. These contradictions further trigger transformation in attitude, knowledge and how activities are practised (Roth & Lee, 2004; Koszalka, 2004). Contradictions are personally experienced and manifest themselves as clashes and problems between internal ideas and certain practices (Ward, 2016). In addition, contradictions represent the conflict between cultural, historical, and new learning that occurs both cognitively and in the outside world (Nardi, 1996). Tools mediate this knowledge; however, sometimes the tools themselves are the source of these contradictions (Nardi, 1996). Therefore, if master's students choose to use their smart phones as a digital technology device for research, contradictions could occur when students must transform from social to professional use. Cell phones are culturally used for entertainment and social learning. Contradictions may therefore cause master's students to deviate from the normalised use of

cell phones. Such experience suggests that learning with tools is constantly reinterpreted and adjusted according to the goal of the activity; and this is what Ward (2016) conceptualised as expansive learning.

Contradictions are a source of learning and development (Abdullah, 2014; Ward, 2016). They also occur when students adapt to the new digital technologies employed for specific activities. Sometimes students may struggle to understand the use of new tools at early phases of encounter. Nonetheless, the purpose of contradictions is to stimulate change in the way students conduct their activities to inform learning. As discussed earlier in Chapter Two, studies by Prensky (2001), Khoza (2011), Khoza and Manik (2015), and Mpungose (2018) have shown that digital immigrants initially struggled with the use of new and evolving digital technologies in their activities. Eventually, students had to adapt to them because they were essential for their professional practices. These adaptations suggest that participants underwent personal contradictions in order to gain knowledge on the use of new digital technologies as required by their activities.

When people participate in activity systems that include the use of new tools (in this case, new digital technologies), their experience can trigger contradictions in which historical and cultural information about specific tools clashes with the new tool, resulting in internal disputes that cause change in the overall activity (Yamagata-Lynch, 2007). According to the CHAT, internal cognitive processes are analysed and understood in relation to external activities because there is mutual transformation (Engeström, 2000). Students need to find relevant approaches to deal with the contradictions that occur to them, thereby promoting learning. These approaches can be explored further through the Zone of Proximal Development.

4.4 The Zone of Proximal Development (ZPD)

To ensure learning, the contradictions cannot be left unresolved. Engeström (1987) discusses a number of ways in which students can deal with contradictions. When previous experience conflicts with the new experience, cognitive development and support must occur. Such support is conceptualised as the Zone of Proximal Development (ZPD) in the CHAT (Vygotsky, 1978). The ZPD occurs when a culturally competent individual helps the less competent one to know and understand how to conduct specific activities (Hardman, 2008).

Yamagata-Lynch (2010) adds that the ZPD occurs when students learn how to conduct activities under the guidance of a more knowledgeable person. The concept 'proximal' implies that the assistance offered to students is beyond their current skills, knowledge and competence. Therefore, the learning builds on their existing abilities (Cole & Cole, 2001).

The ZPD occurs in the form of guided practice between an expert and a novice (Shabani, Khatib, & Ebadi, 2010). In this study, the ZPD occurs when a culturally advanced person assists another with the use of digital technologies to mediate activities and achieve desired goals. When a more knowledgeable person assists students in using digital technologies by following formal theoretical procedures and instructions, such promotes professionalisation experiences. However, when the guidance occurs socially and informally, the socialisation experience is supported. The ZPD negotiated in CHAT elaborates socio-cultural processes in which learning, and development occur (Shabani et al., 2010).

The knowledgeable person can also belong in the community where the actor (master's student) is found, who can be a supervisor, colleague, friend, fellow student or librarian. In this regard, a master's student can be professionally developed by academic staff, a supervisor or a librarian on how to use digital technologies in research. This development can occur through workshops, meetings and seminars supporting the professionalisation experience. The students may also learn socially from other culturally advanced peers, colleagues, family and friends to effectively use digital technologies for research by informally engaging with them.

During the ZPD, the potential level of development of a student is determined by their ability to conduct activities using their prior knowledge and skills about tools. Their development is determined through the activities completed under the guidance of a competent individual (Shabani et al., 2010; Vygotsky, 1978; Wertsch, 1984). Vygotsky also believed that activities which occur through guided practice facilitate a higher level of thinking (Yelland & Masters, 2007). The ZPD helps in identifying students' behaviour and cognitive abilities in activities and in using tools (Kozulin, 2004). As we are living in a digital age and the world is moving towards the 4IR, it is assumed that master's students come with some prior knowledge and skills on digital technologies for either socialisation or professionalisation experience.

Thus, when ZPD occurs, master’s students show their skills and knowledge in how they use digital technologies for research. Such would be seen at the initial stages of their projects (potential development) as influenced by their socialisation experiences. Scaffolding occurs when an expert (supervisor, librarian, colleague) guides and instructs the student. The expert shares advanced expertise in using digital technologies, thus building up on professionalisation experiences for a novice (Rasmussen, 2001; Verenikina, 2003). Moreover, professionalisation includes every action of development prescribed according to specific rules (actual development). Potential development refers to an individual developing provided that there are groups of communities still available to socialise with (socialisation). In addition, specific tools are used to support developmental learning (Jacobs, 2001).

The goal of ZPD is for the student to complete research activities (using digital technologies) independently in future, having an increased understanding of how to do so (Shabani et al., 2010). The ZPD occurs during the student’s personalisation experience with digital technologies. During the personalisation experience, the student begins by consciously using digital technologies enabled by their potential and actual development. Eventually, as they gain familiarity with the digital technologies, the student’s practices would occur subconsciously without the guidance of an expert. The following figure visually represents the developmental stages of the ZPD as employed in this study.

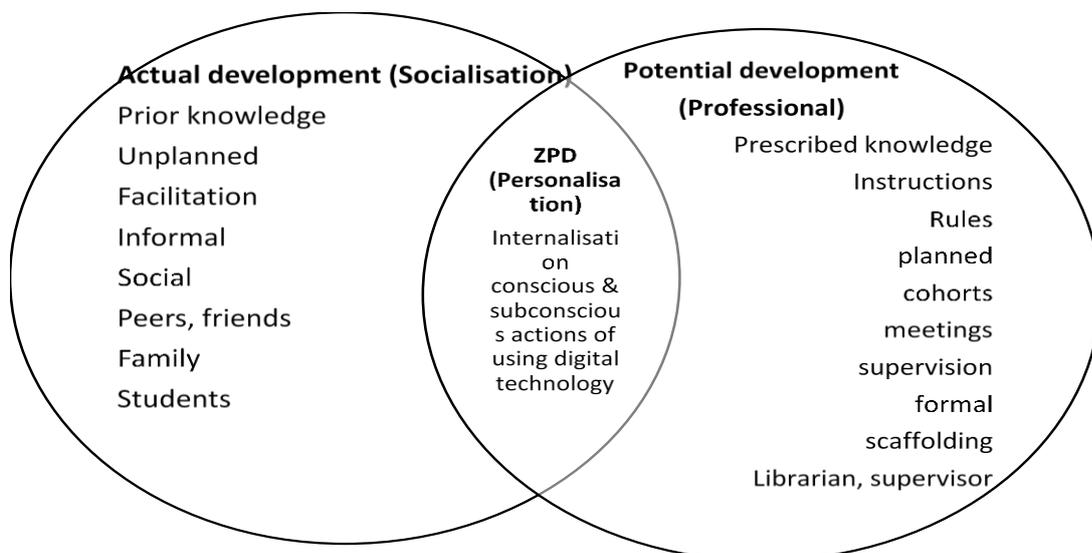


Figure 4.4: The ZPD occurring through students' personalisation process as informed by actual and potential development in relation to this study, adapted from (Sarker, 2019, p.31) .

According to Vygotsky (1978), the ZPD is associated with the social and cultural sense of operating, in which people engage socially to build information and complete activities. Thus, through joint collaboration between actual and potential development, students can internalise new knowledge and skills which they can express in their activities (Shabani et al., 2010). Students can develop meaningful cognitive processes through external socialisation and professional interaction. When master's students make sense of the use of digital technologies to address their personal research needs (personalisation), they internalise the culture of these digital technologies and use them to improve their studies. This occurrence is what Vygotsky (1962); Vygotsky (1987); Yelland and Masters (2007) conceptualised as internalisation. Learning is initially social, and only becomes an internalised experience when students accomplish activities at a higher level of understanding.

4.5 Theorising the Core Concepts of CHAT in Relation to this Study

People use various tools to communicate and search for information. The CHAT is recognised widely for enabling an understanding on how people engage in activities using tools (Hashim & Jones, 2007). In this study, master's students (actors) use digital technologies as tools to mediate research activities. The CHAT is useful in understanding participants' dynamic experiences with the use of digital technologies in research. The concepts of the CHAT include actors, tools, object (goal), community, division of labour and rules. The following figure explains how the CHAT concepts have been used in this study to inform master's students' experiences of using digital technologies in research.

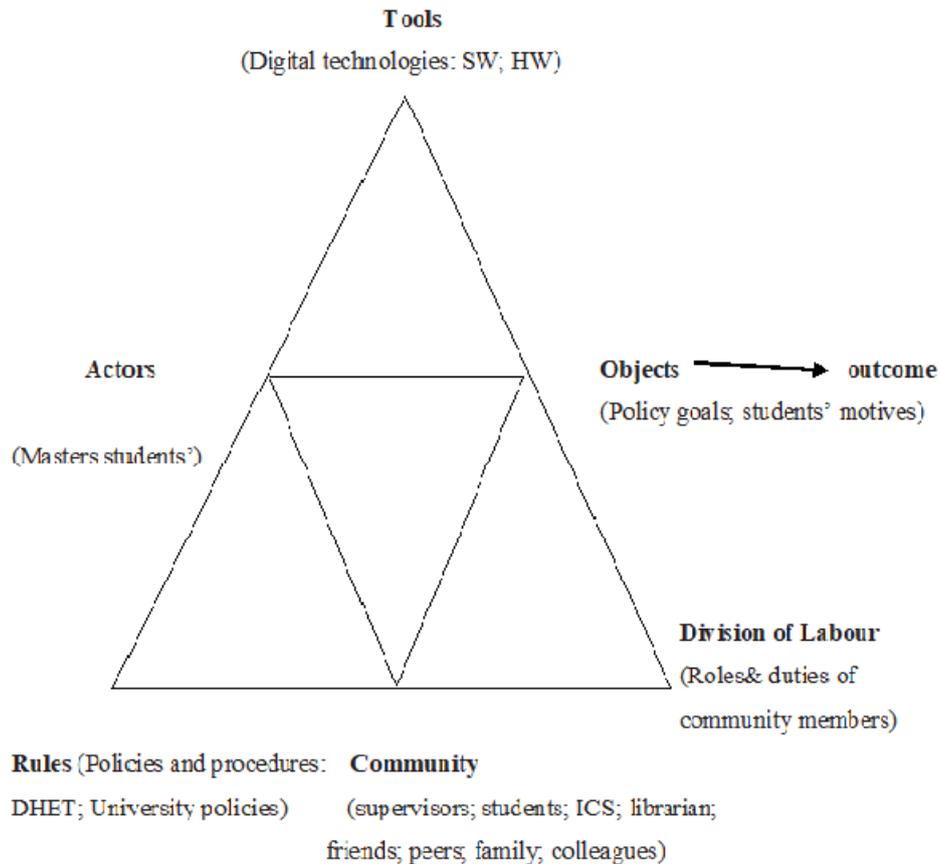


Figure 4.5. CHAT concepts in relation to this study, adapted from (Engeström, 2001)

In the upper segment of the triangle (Figure 4.5 above), the actors (master's students) engage in a research activity, motivated by their object (goal) to complete a master's dissertation. Research activities that occur during the dissertation write-up process are mediated by specific tools (digital technologies) to transform their object (goal) into an outcome in which the students actually complete their dissertation and graduate with an M.Ed. degree. Furthermore, the lower segment of the triangle indicates how master's students' research activities are influenced by historical and cultural contexts found within a community (supervisors, ICS, librarian, friends, peers, family, colleagues). The rules (policies, procedures, Department of Higher Education and Training- DHET and university policies) guide the process of research activities. Lastly, community members have their own roles and duties to play to ensure that master's students' research activities occur effectively. The section below discusses each concept in detail.

4.5.1 Actors

Actors are the individuals who execute an activity so that they can achieve the desired outcome(s). The idea of an activity itself projects that there are people who need to engage in a particular task (Kuutti, 1996). Actors can also be viewed as any person(s) involved in the process of achieving the object (goal), and further transforming it into an outcome (Dayton, 2000). Thus, the actors are the people or persons whose actions are being studied (Hashim & Jones, 2007). The actor uses tools to solve problems in order to achieve the outcome (Hardman, 2008). These tools include digital technologies that actors use to carry out activities (Kaptelinin, 2005). In this study, the actors are the fourteen master's students who engaged in their research studies (activity). Their actions and rationale for using digital technologies in research are studied to gain an understanding of their experiences. Therefore, the participants are asked to share their experiences of using the various digital technologies in research.

4.5.2 Tools used in research

Hashim and Jones (2007) argue that in the CHAT, the tools refer to the digital technologies which mediate an activity conducted by actors. Similarly, Pekarek Doehler (2002) indicates that tools are used by actors to perform an activity in a socio-cultural environment. Thus, tools are used for scaffolding an activity and mediating learning experiences (Masters, 2009). The tools in this study refer to the digital technologies (hardware, software and ideological-ware resources) used by the master's students during their research studies. These tools may include, computers, cellphones, printers (hardware), the Internet, Microsoft (software), and data analysis software such as NVivo. These tools are used to conduct research and to mediate other activities related to a master's study.

Hardman (2008, p.72) purports that "these tools mediate thought during the interaction between the actors and the context within an activity". Master's students can use digital technologies to portray and organise their ideas as part of their research activities. The introduction of tools such as digital technologies improves the activity processes (Hashim & Jones, 2007). For instance, students can use a computer (hardware) and Microsoft Word (software) to articulate their research findings, proceeding with dissertation write-up. Digital technologies used for research activities therefore aim to support students when they conduct their studies.

Kuutti (1996) emphasises that the constant development of tools such as digital technologies bring about change in use depending on the goal of the activity. As discussed earlier in the literature review Chapters (Two and Three), studies such as those of Annamalai (2019); Bosch (2009), Deng and Tavares (2013), Henry et al. (2016), Khoza (2015a, 2018), and Mpungose (2019b) reveal that social media software such as Facebook and WhatsApp have been employed for professionalisation experiences even though they are culturally used for socialisation experiences. Thus, the cultural use of digital technologies may change according to the purpose of an activity (Masters, 2009). Actors can always modify and shape their use of digital technologies to suit the implementation of their research activities (Trust, 2017).

4.5.3 Objects (Goals)

Hashim and Jones (2007) postulate that, in the CHAT, the object refers to the intention of engaging in an activity. Similarly, Masters (2009) declares that an object represents the desired goals an actor is striving to achieve. Thus, goals motivate actors to engage in activities that will aid in the attainment of stipulated targets (Trust, 2017). The object is an aim of an activity system that may generate a product (Nardi, 1996). Objects are generated to meet actors' needs and to drive the implementation of activities (Engestrom, 2000). Master's students therefore engage in activities that help them achieve their research goals. In this study the objects are master's students' research goals, motives, and objectives for using digital technologies. These goals can be short-and long-term according to their individual needs.

In addition, the university may also have its goals for employing the use of digital technologies for the master's programme which may be revealed in master's students' experiences. These goals are stipulated in the university policies that govern research studies and supervision for master's students (assessment, college supervision contract, plagiarism and DHET policies). The objects are the main reason actors participate in an activity (Kaptelinin, 2005). When the objects have been reached, they are further transformed into outcomes (Masters, 2009).

4.5.4 Outcome(s)

Outcomes are the end products that occur after the activities have been completed. Amory (2010) provides further insights into the notion of outcomes. Amory (2010) states that the outcomes of an activity are owing to the actors' interrogation of objects through the use of

tools. Kuutti (1996) also argues that objects are transformed into outcomes through the existence of an activity. Therefore, actors that conduct the activity determine how the object is transformed into an outcome (Engeström, 2001). These outcomes are determined by the students' achievement of their goals, that are informed by research needs. Therefore, in this study the outcomes include master's students' personalisation experiences of using digital technologies that occur when their individual research needs have been met. Moreover, the outcome can also be based on the results of the actors' activity once completed (Yamagata-Lynch, 2007).

4.5.5 Community

Masters (2009) pronounces that actors do not exist in a vacuum but belong to a particular community. Dayton (2000) argues that a community is the group(s) of individuals responsible for influencing the transformation of an object (goal). Kuutti (1996) also stipulates that the community is the people responsible for helping the actors achieve their object (goal). Therefore all activities achieved by the actor are highly contextualised, implying the existence and influences of a community (Lupu, 2011). The community in this study consists of the people within the university in which the participants are studying. Moreover, the people from outside the university (society at large) also contribute to master's students' use of digital technologies in research. These community members include the entire body of students, academic staff, supervisors, Human Resource Department (HR) department, Information and Computer Science ICS team, librarians (within university), family, friends, colleagues, Department of Basic Education (DBE) and peers (outside university). The community is thus the group of people to which the actors belong while engaging an activity (Yamagata-Lynch, 2007).

Master's students (actors) may have engaged with various people to inform their experiences of using digital technologies. The community reminds the reader of the culture and the history behind how and why master's students use digital technologies the way they do. Moreover, community members negotiate the division of labour for participation in activities (Trust, 2017). Each community member has a personal duty and role to play in contributing to master's students' personalisation experiences of using digital technologies for research purposes.

4.5.6 Division of labour

Hashim and Jones (2007) assert that the division of labour distributes roles and responsibilities amongst members of the community. Likewise, Yamagata-Lynch (2007) discusses that the sharing of tasks between community members while actors engage in an activity is called the division of labour. According to Amory (2010), the division of labour mediates between the object (goal) and the community. Similarly, Hettinga (1998) notes that an object (goal) and the community are mediated by a division of labour. In order for goals to be attained and transformed into outcomes, each community member thus must be aware of roles and duties that contribute to achievement of the object (goal). The division of labour is seen as important in this study. Such a division acknowledges that actors may need assistance from other people in order to carry out actions within an activity system. Other people from the community may come with necessary skills, knowledge, and interest that may contribute positively to the processes that occur during the execution of activities (Kaptelinin & Nardi, 2006; Trust, 2017).

The division of labour in this study involves the manifold roles and duties of the community in aiding master's students to reach their goals. These are the roles and responsibilities that other students, lecturers, supervisors' family, the HR department, friends, the DBE, and ICS have to play in how master's students experience the use of digital technologies in research. On the one hand, the HR department can ensure that the student is fully enrolled in the master's programme so that they access the supervision, resources, and platforms necessary to conduct their studies. On the other hand, other students may share the platforms (online software platforms) on which participants can retrieve valuable information for their studies.

4.5.7 Rules to be followed in research

Yamagata-Lynch (2007) stipulates that rules are either formal or informal procedures that allow an activity to occur. Amory (2010) also argues that the rules in CHAT mediate relationships between actors and the community. Moreover, Hashim and Jones (2007) support Amory (2010), by postulating that rules are regulations, norms and conventions that control the community, determining how they should engage in duties. Therefore, rules govern actors and community members on how to go about their activities in order to achieve desired outcomes (Masters, 2009). The rules also mediate activities and actors' interaction with tools (Sannino & Engeström, 2018). When master's students access electronic articles online from

multiple sites, they have to follow certain procedures such as paying for the article or requesting the soft copy from the university electronic library. This process is guided by relevant university policies. When students download articles from specific websites, they have to follow rules of the website supporting professionalisation experiences.

In this study, the rules include the actual procedures and policies to be followed by the actors and community members on the use of digital technologies in research. These procedures may involve master's students being invited by the university to attend workshops and training on how to use digital technologies such as Endnote and NVivo for referencing and data analysis. Furthermore, the rules may also include the university supervision policy and contract, assessment policy, and other policies stipulated by the DHET to guide and facilitate the use of digital technologies in higher education research. These policies also negotiate the goals for using digital technologies in research at higher education level.

4.6 The Unified Theory of Acceptance and Use of Technology (UTAUT)

4.6.1 Conceptual framework

UTAUT is a conceptual framework that helps in understanding people's acceptance and behavioural experiences when using digital technology. A conceptual framework can be explained as theoretical constructs that aim to make study findings meaningful by directing and guiding research enquiry (Adom et al., 2016). Svinicki (2010) proposes that a conceptual framework "serves as the basis for understanding the correlational patterns or interconnections across events, ideas, observations, concepts, knowledge, interpretations and other components of experience" (p. 5). A conceptual framework provides a structured explanation of the phenomenon explored by a researcher (Camp, 2001). In this way, it logically describes the key concepts that best explain a phenomenon, showing how ideas relate to one another (Grant & Osanloo, 2014). Similarly, Rocco and Plakhotnik (2009) assert that the role of a conceptual framework is to explain and categorise concepts to show relationships among them relative to the explored phenomenon.

Therefore, conceptual frameworks help with structuring the thinking of a research study to provide guidance and understanding on social phenomena. Conceptually framing a study allows for prediction and interpretation of social realities that foster understanding of phenomena, rather than merely offering an explanation (Jabareen, 2009). So, unlike a theoretical framework that provides knowledge and explanations about phenomena, a conceptual framework offers explanations, predictions and interpretations on issues through structured concepts. The concepts are like a connected network of comprehensive understanding of phenomena (Jabareen, 2009). A researcher can interpret framework concepts according to the convenience of their own study. This study employed the UTAUT as a conceptual framework to complement the CHAT regarding master's students' behaviour, acceptance, and belief in digital technology use.

4.6.2 Background of UTAUT

UTAUT is a conceptual framework that was founded by Venkatesh et al. (2003) as a means of exploring and understanding behavioural intentions and acceptance influences in the use of digital technologies. The primary purpose of the UTAUT is to explore people's knowledge, skills and acceptance of existing and new evolving digital technologies (Venkatesh et al., 2003). Thus, UTAUT founders conducted a study comparing the similarities between eight technology models. Their findings emerged with a more unified framework containing four constructs or predictors influencing technology usage and behavioural intention which they proposed as the UTAUT (Donaldson, 2011). The UTAUT key constructs were found to be affected by four moderators, including age, gender, experience, and voluntariness of use which also impacts on users' behaviour (Mudaly, 2012; Yahya, Nadzar, & Rahman, 2012). Also, the moderators have either enhancing or limiting effects on key constructs, depending on a person's behavioural intention of using digital technologies (Aliyu, Arasanmi, & Ekundayo, 2019). In addition, the UTAUT considers aspects such as gender, age, experience, and voluntariness that may contribute to the experiences of master's students' use of digital technologies, which the CHAT did not theorise. In this way, the UTAUT makes it possible to explore the phenomenon (experiences of using digital technology) in greater detail.

Moreover, Venkatesh and Zhang (2010) aver that studies on the UTAUT were conducted in the United States of America (USA) and in some parts of Asia such as China. The findings were unsystematic and determined by the cultural context of where the technology adoption

was occurring. This variance in use suggested the importance of cultural contexts in understanding the digital technology adoption (Venkatesh & Zhang, 2010). Therefore, it is worth noting that culture plays a powerful role in contributing towards people's behaviour (Leidner & Kayworth, 2006).

The UTAUT is similar to the CHAT in that both frameworks consider the cultural aspects of individuals when it comes to digital technology usage. This cultural influence informs digital technology users' personalisation experiences. The culture of using digital technologies is internalised by users, and becomes personalised, thus performed subconsciously overtime during digital tasks. Even so, the UTAUT has been credited for explaining huge variances in behavioural intention by digital technology users (Venkatesh et al., 2003). The UTAUT aids in understanding what influences users' acceptance of digital technologies. By means of the UTAUT, users' intention to use digital technologies for specific activities can be evaluated (Yahya et al., 2012). As a result of this accreditation, the UTAUT has become the most relevant and commonly used conceptual framework in exploring the experiences of using digital technologies across fields of research such as IT, banking, economic management, and education. The UTAUT has been found to have greater explanatory power than any other technology acceptance theory in terms of analysing experiences relating to digital technology use (Mansoori, 2017; Qingfei et al., 2008; Venkatesh & Zhang, 2010).

The models that were combined by the UTAUT to explain acceptance and behavioural intention of using digital technologies included the Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Combined TAM, Theory of Planned Behaviour (TPB), Diffusion of Innovation (DOI), Social Cognitive Theory (SCT), Motivational Model (MM), and Model of PC Utilization (MPCU) (Al-Qeisi, 2009; Alkhasawneh & Alanazy, 2015). The models emerged from various theoretical underpinnings such as sociology, information systems and psychology (Chaputula, 2016). Each of these models had its own sets of predictors about technology acceptance. The UTAUT framework comprehensively combined their elements to form one conceptual framework (Venkatesh et al., 2003). The UTAUT outperformed all the older eight technology models by incorporating only the strengths of their elements to form one logical and unified framework (Venkatesh et al., 2003; Alkhasawneh & Alanazy, 2015). Waehama et al. (2014), note that UTAUT includes more uniform constructs that influence behavioural intention and use behaviour, derived from previous models.

Therefore, the UTAUT avoided the limitations of prior models and emerged as the most encompassing technology adoption framework.

In this study, the constructs of the UTAUT, such as performance expectancy, effort expectancy, social influence, and facilitating conditions, help in understanding master’s students’ acceptance and behaviour of the digital technologies used in research. Universities keep presenting new digital technologies for the enhancement of teaching, learning and research (Aliyu, Arasanmi, & Ekundayo, 2019). The UTAUT provides relevant constructs on understanding digital technology experiences and acceptance for large organisations such as universities consisting of many people of different gender, age, and experience (Hsu, 2012). Such socio-demographics such age, gender and experience have been found by the UTAUT to be influencing moderators on ways in which people use digital technologies.

4.7 Constructs Found in UTAUT

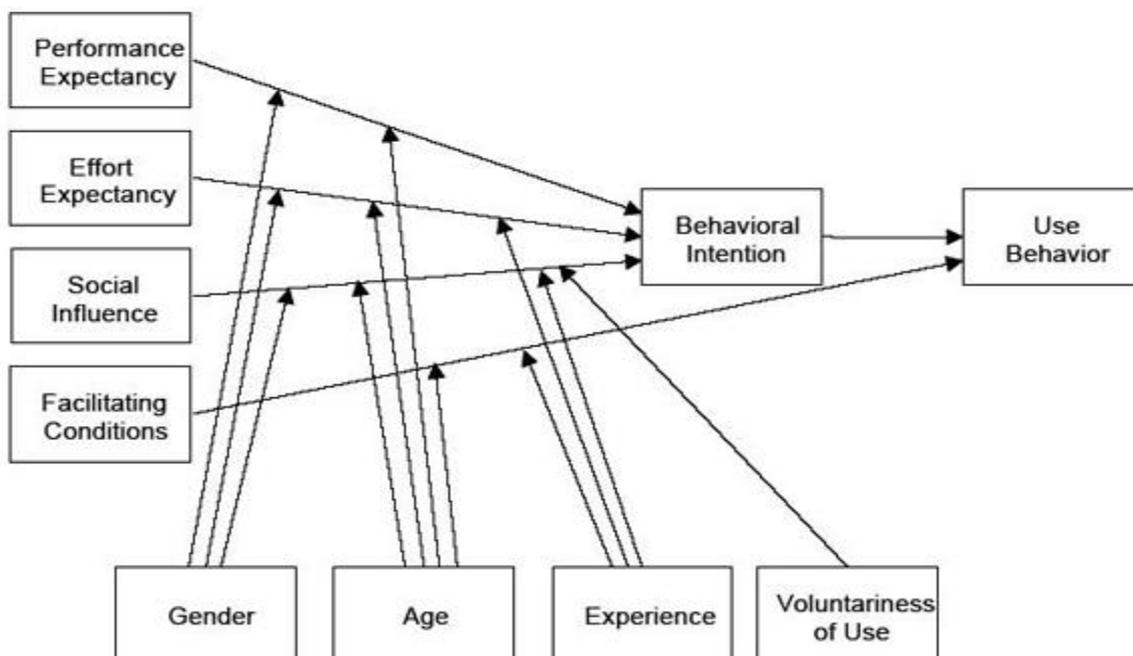


Figure 4.6: The Unified Theory of Acceptance and Use of Technology (UTAUT) taken from (Berry, 2017, p. 5).

As depicted in Figure 4.6 above, the first three constructs (performance expectancy, effort expectancy and social influence) have an impact on behavioural intention of using new and

existing digital technologies. The facilitating conditions construct, on the other hand has a direct influence on use behaviour. There are also four moderators (gender, age, experience, voluntariness of use) which have an effect on the constructs and their relation to behavioural intention and use behaviour. The arrows in Figure 4.6 indicate the relationships between constructs, moderators, behavioural intention, and use behaviour.

Behavioural intention is the extent to which a person plans either to perform or not perform targeted behaviour (Al-Momani, Mahmoud, & Sharifuddin, 2016). In the context of this study, behavioural intention can be described as master's students' probability of completing research activities using digital technologies (Choshaly & Tih, 2017). Use behaviour refers to a persons' performance of the targeted behaviour. For example, the actual use of digital technology in research is a target behaviour (Alwahaishi & Snásel, 2013). Therefore, the behavioural intention can be translated into use behaviour by engaging with the digital technologies to inform personalisation experiences (Alwahaishi & Snásel, 2013). Behavioural intention strongly defines the actual behaviour of using digital technology (Abubakar & Ahmad, 2014). The UTAUT argues that behavioural intention determines people's acceptance and actual use of digital technologies.

4.7.1 Performance expectancy: Affected by Age and Gender

The UTAUT model discusses the constructs that affect behavioural intention of using digital technology such as Performance expectancy, effort expectancy, social influences and facilitating conditions. This section elaborates on performance expectancy as a construct that influences behavioural intention also affected by age and gender. Therefore, according to Venkatesh et al. (2016) and Yahya et al. (2012), performance expectancy alludes to the extent to which users believe that digital technologies will help them accomplish tasks. Similarly, Aliyu et al. (2019), Mudaly (2012), and Venkatesh et al. (2003) postulate that performance expectancy speaks to the degree to which people perceive that digital technologies will enhance their tasks. This suggests that performance expectancy is the anticipation of using digital technology with the hope of finishing activities. The term users in UTAUT describes participants who use digital technologies for their various tasks. In this study, the users refer to the master's students who use digital technologies for their research tasks.

In addition, Berry (2017), Donaldson (2011), Tan (2013), and Baishya, Samalia, and Joshi (2017) comment that the performance expectancy construct draws its ideology from elements

of various models such as extrinsic motivation (MM), relative advantage (DOI), Perceived usefulness (TAM, TPB), and job-fit (MPCU). Furthermore, performance expectancy is the greatest contributor to behavioural intention in both voluntary and compulsory experiences of using digital technologies compared with the remaining two constructs (Venkatesh et al., 2003). For the purposes of this study, performance expectancy is seen as the degree to which master's students believe digital technologies will help them generate data and complete their dissertation write-up (professionalisation experience). This performance is expected because master's students have to use digital technologies in order to access relevant information for their research studies.

Performance expectancy is further affected by the gender and age of users. The difference in gender performance expectancy is socially constructed as a result of the roles given to males and females from birth (Mukaila & Sotayo, 2015). This suggests that socialisation experience is promoted in the gender differences. The way in which a person has been socialised on the use of digital technologies shows in their performance (use behaviour). On the one hand, the UTAUT observes males as greatly task-driven. Therefore performance expectancies are likely to be more advanced in male users than in females (Minton & Schneider, 1980). On the other hand, when it comes to age, studies by Morris and Venkatesh (2000a), and Venkatesh, Thong, and Xu (2012) assert that older users may experience difficulty in learning how to use new digital technologies; hence performance expectancy becomes less salient. This difficulty in use is related to the deterioration of cognitive abilities associated with aging (Minton & Schneider, 1980). The UTAUT argues that performance expectancy on behavioural intention is prominent in younger males because of their strong drive for technology success (Venkatesh & Zhang, 2010). However, through continuous effort and facilitated training, performance expectancy can be enhanced regardless of age or gender of the user.

4.7.2 Effort expectancy: Affected by Gender, Age, and Experience

Effort expectancy is the second construct negotiated by the UTAUT in relation to understanding users' behaviours and acceptance in using digital technology. This construct is further affected by the user's gender, age, and experience (to be discussed later). In this regard, Venkatesh et al. (2003), Van Dyk (2014), and Hsu (2012) discuss that effort expectancy alludes to the degree of ease that users associate with using digital technologies. Likewise, Venkatesh and Zhang (2010) explain that effort expectancy refers to the users perception of ease when

using digital technology. The ease of use covers the understandability, clarity and flexibility of using digital technologies (Venkatesh et al., 2003). Thus, the easier it is to use the digital technology, the more useful it is perceived in conducting activities (Dwivedi, Rana, Jeyaraj, Clement, & Williams, 2019).

According to Al-Qeisi (2009), Berry (2017), Chiemeké and Ewwiekpaefe (2011), Donaldson (2011), Kim and Crowston (2011), Mudaly (2012), and Venkatesh et al. (2003) effort expectancy is derived from ideas of the ease of use (TAM/TAM2/TPB), self-efficacy (SCT), and complexity (MPCU/DOI) constructs. In addition, effort expectancy is important for both voluntary and compulsory use of digital technologies (Venkatesh, Thong, Chan, Hu, & Brown, 2011). However, effort expectancy becomes less significant when the digital technology has been used for an extended amount of time (Venkatesh & Zhang, 2010). Effort expectancy is predicted to be more prominent during early phases of using new digital technologies when having a positive effect on user acceptance of the technology (Marchewka & Kostiwa, 2007). In this study, master's students use digital technologies in a mandatory context. Their studies require them to use digital technologies to generate data (existing literature and empirical). Furthermore, students' effort expectancies are expected to unfold in the early stages of using new digital technologies (if any) for the first time in their research studies. The UTAUT found effort expectancy less significant over an extended time in use of digital technology. Thus, effort expectancy can be argued to have a positive influence on behavioural intention (Venkatesh, Morris, & Ackerman, 2000).

Venkatesh et al. (2011) suggest that effort expectancy is linked to users' general belief about digital technologies. Users may have certain belief and expectations about the user-friendliness of particular digital technologies. Through the actual use of the digital technology, users can either confirm or disconfirm their beliefs (Venkatesh et al., 2011). This confirmation process has an indirect impact on users' acceptance of that particular digital technology (Chiemeké & Ewwiekpaefe, 2011). In this study, effort expectancy is linked to master's students' use of digital technologies. The continuation of use of digital technologies for research is likely to be influenced by how easy or difficult it is to access information (articles, e-books, websites). Therefore, effort expectancy affects user satisfaction and acceptance of a digital technology (Alwahaishi & Snásel, 2013). The acceptance (due to perceived ease) may cause the user to continue using the digital technology for their activities.

Regarding the issues of gender, age and experience as linked to effort expectancy, UTAUT substantiates that males are more willing to persist in understanding and overcoming the difficulties of the use of digital technologies; females rely more on effort expectancy (Venkatesh, Morris, & Ackerman, 2000). Al-Qeisi (2009) also argues that effort expectancy is stronger for young females and older individuals at initial phases of experiencing digital technologies. Similarly, Marchewka and Kostiwa (2007) postulate that effort expectancy is highly significant in female users, older people, and those individuals with less experience in using digital technologies. Effort expectancy can be suggested to inform users' personalisation experiences. Perceived ease differs according to each individual's prior knowledge and experience of using digital technology. Therefore, it can be concluded that the UTAUT predicts that males do not rely on the easiness of using digital technology. Rather females, older students, and less experienced users are likely to do so.

4.7.3 Social influence: Affected by Age, Gender, Experience and Voluntariness

Mudaly (2012) proposes that social influence refers to users' perception on how important other people believe digital technologies to be. Similarly, Venkatesh et al. (2003), Venkatesh et al. (2011), and Venkatesh et al. (2016) have indicated that social influence alludes to the degree to which a person perceives the importance of others' beliefs in using a new digital technology. Furthermore, social influence is adapted from ideas of subjective norms (TRA/TAM2/TPB), Images (DOI) and Factors (MPCU) (Donalson, 2011; Yahya, 2012; Venk et al., 2016). As with the previous constructs (performance expectancy; effort expectancy), social influence has its roots in ideologies of previous models which were modified to inform how other people in the society can influence a user's perception in using particular digital technologies.

The social influences that affect users' perception can be made up of social members that users associate with such as teachers, friends, family, and other students (Hsieh, 2011). Social influence is thus linked to the norms, beliefs, and behaviour of the society in which the user is found (Odeh, 2019). Additionally, these social norms and beliefs affect users' intention. Such

norms consider the opinions of their associates, such as friends, family and colleagues on using digital technologies for specific activities (Odeh, 2019).

Social influence has to do with users' acceptance of the opinions and views of acquaintances in relation to their behavioural intention. Also, users tend to respond more to others' opinions when they do not have sufficient experience in using digital technologies (Morris & Venkatesh, 2000a). These mostly inexperienced users comply with the opinions of the people they consider important, who either recommend or discourage the use of particular digital technologies (Alwahaishi & Snásel, 2013). In a voluntary context, the social opinion, beliefs and influences are internalised by digital technology users in order to inform their behavioural intention (Al-Qeisi, 2009; Venkatesh & Zhang, 2010). The internalisation of social influence suggests that users' store (mentally) the opinions provided by their associates. These influences subconsciously indicate how they use digital technologies, thus supporting personalisation experiences. Each user has different social influences that inform their personal experiences of using digital technologies. In this study, master's students' social influences may come from their supervisor, academic staff, friends, family, colleagues and other students. It is understood that master's students do not exist in isolation but are situated in a particular society that may influence how they use digital technologies in research.

The UTAUT further implies that social influence is moderated by age, gender, voluntariness, and experience. Social influence is found to have a great effect on female users in early stages of their experience with digital technologies (Al-Qeisi, 2009). Chaputula (2016) also suggests that older users tend to have high dependence on social influence especially if they have very little experience with digital technologies. Venkatesh and Zhang (2010) argue that, where digital technology is of voluntary use, social influence is most salient; people share information about digital technology use in both formal and informal ways. Therefore, the UTAUT predicts that social influence is affected by all four moderators with high prominence in older, female, inexperienced and voluntary users.

4.7.4 Facilitating conditions: Affected by Age and Experience

The three constructs (performance expectancy, effort expectancy and social influence) have been discussed, and their contribution towards behavioural intention has been outlined.

Therefore, the facilitating condition is the last construct negotiated by UTAUT as it directly affects use behaviour. Kaba and Toure (2014), Dwivedi et al. (2019), Chiemekwe and Ewwiekpaefe (2011), and Venkatesh et al. (2003) posit that facilitating conditions involve the degree to which users believe that there is an organisational and technical structure that exists to support them with the use of digital technology. Similarly, Mudaly (2012) explains that facilitating conditions refers to users' perception of the availability of technical infrastructure to support the use of new digital technologies. Facilitating conditions refers to the support and training that is available to users to advance their digital skills or offer assistance if they face difficulties using digital technologies.

The facilitating conditions construct emerged from three ideologies of previous models perceived behavioural control (TPB/ DTPB/combined TAM/TPB), facilitating conditions (MPCU), and compatibility (DOI) (Al-Qeisi, 2009; Venkatesh et al., 2003; Venkatesh et al., 2011; Venkatesh et al., 2012). Facilitating conditions are significant because this aspect is the only predictor that directly affects use behaviour, reflecting the actual use of digital technologies by users. Facilitating conditions include the extent to which users may become fully used to operating the technology (Venkatesh et al., 2012). The support avenues for efficient use of digital technologies may occur over a period of time. Users may experience technical difficulties at different stages of operating their systems. When performance expectancy and effort expectancy are not evident in users' early experiences with digital technologies, facilitating conditions become the most relevant in predicting use behaviour (Venkatesh et al., 2003; Al-Qeisi, 2009). Facilitating conditions only becomes prominent when users have not perceived the usefulness and ease of a particular digital technology.

The UTAUT reflects that facilitating conditions are moderated by age and experience, these factors having an influence on use behaviour that may require relevant facilitation and support (Venkatesh et al., 2003). Venkatesh et al. (2012) conducted a study to evaluate consumer acceptance and use of digital technologies. The findings indicated that older female users urged for more facilitating conditions than younger male users. The study brings in the issues of gender in their findings. However, for the sake of reviewing moderators that affect facilitating conditions, the main focus is drawn to the age influence in using digital technologies. Mansoori (2017) also found that older users experienced manifold challenges in understanding the use of digital technologies. Such users had settled into the traditional way of studying which worked

for them in the past (reading and writing manually). Qingfei et al. (2008) confirm that, unlike older users, younger and experienced users have the most positive experiences with digital technology. In terms of age, older users are therefore likely to rely on facilitating conditions more than younger users.

Expanding the notion of experience as a moderator affecting facilitating condition, Rahi et al. (2019) argue that necessary skills and knowledge about digital technology aid in relevant experience needed for adopting new technology. Similarly, Mansoori (2017) attests that deep knowledge and skills about digital technologies leads to advanced digital literacy and awareness. Should users lack such experience their intention to adopt new technology drops. They are propelled to rely greatly on facilitating conditions for assistance (Rahi et al., 2019). Venkatesh et al. (2012) argue that more experienced users usually have vast knowledge and skills in using digital technology, depending less on external support structures. The UTAUT proposes that young and experienced users rely less on facilitating conditions than do older and inexperienced users.

In this study, master's students' use of digital technologies may also rely on the availability of support structures within the university in order to help them enhance their digital skills or offer necessary training. It has already been argued by Khoza and Manik (2015), and Onaolapo and Oyewole (2018) that postgraduate students come with diverse needs when it comes to using digital technologies for research purposes. Therefore, universities may offer their students organisational and technical support such as digital technology training organised by ICS staff together with the school's librarian (professionalisation experience). For example, they may offer professional workshops for software such as NVivo, Endnote, and Turnitin for their students, especially if such digital technologies are mandatory to use in research.

4.8 Empirical studies on UTAUT

It has been evidenced from the above discussion that the socio-demographic features of users can influence the use of digital technologies. Thus, there have been a number of studies conducted using UTAUT as a conceptual framework to explore the users' experiences of using digital technologies across different contexts. The table below presents a summary of these studies.

Table 4.1: Summary of Studies that have been Conducted with the Conceptual Framing of UTAUT

Authors	Study title	Context	Approach and number of participants
Al-Awadhi and Morris (2008)	The use of UTAUT model in the adoption of E-government services in Kuwait	Kuwait	Quantitative & 880 undergraduate Students
Al-Qeisi (2009)	Analyzing the Use of UTAUT Model in Explaining an Online Behaviour: Internet Banking Adoption	UK and Jordan	Mixed method approach 430 internet banking users
Berry (2017)	Behavioral Intention and Use Behavior of Social Networking Websites among Senior Adults	USA	Quantitative & 105 Senior adults
Onaolapo et al. (2018)	Performance expectancy, Effort expectancy, and facilitating conditions as factors influencing smart phones use for mobile learning by postgraduate students of the university of Ibadan, Nigeria	Nigeria	Quantitative & 217 Postgraduate students (Honours, Master's, PhD) from social science, education and agricultural sciences
Al-Shafi and Weerakkody (2009)	Understanding citizens behavioural intention in the adoption of e-government services in the state of Qatar	Qatar	Quantitative & 250 undergraduate students
Chaputula (2016)	eReadiness of Public University Libraries in Malawi with Special Reference to the Use of Mobile Phones in the Provision of Library	Malawi	Mixed method approach & 370 students (undergraduates and postgraduates) 255 staff 5 librarians

	and Information Services		5 ICT directors
Odeh (2019)	Factors Affecting the Adoption of Financial Information Systems Based on UTAUT Model	Jordan	Quantitative & 322 small medium enterprise participants
Hsu (2012)	The Acceptance of Moodle: An Empirical Study Based on UTAUT	Taiwan	Quantitative & 47 EFL students
Rahi et al. (2019)	Integration of unified theory of acceptance and use of technology in internet banking adoption setting: Evidence from Pakistan	Pakistan	Quantitative& 398 Customers of commercial banks
Alkhasawneh and Alanazy (2015)	Adopt ICT among Academic Staff in Aljouf University: Using UTAUT Model	Saudi Arabia	Quantitative & 60 staff members
Donaldson (2011)	Student Acceptance of Mobile Learning	USA	Mixed method approach & 330 undergraduate students

In analysing the above Table 4.1, a number of inferences can be made. For instance most studies rely heavily on quantitative approaches. A few studies employ a mixed-methods approach (Al-Awadhi & Morris, 2008; Al-Shafi & Weerakkody, 2009; Alkhasawneh & Alanazy, 2015; Berry, 2017; Onaolapo et al., 2018; Hsu, 2012; Odeh, 2019; Rahi et al., 2019; Donaldson, 2011; Chaputula, 2016; Al-Qeisi, 2009). Moreover, some studies that have employed the UTAUT have mostly been conducted in other fields of research such as banking

and e-government; for example, (Odeh, 2019; Al-Awadhi & Morris, 2015; Al-Shafi & Weerakkody, 2009; Rahi et al. 2019). Other studies have been conducted specifically on higher education and learning. These studies are either based on undergraduate students, academic staff or on a large pool of postgraduate students (Chaputula, 2016; Donaldson, 2011; Onaolapo et al.,2018). The phenomenon of some of these studies was not experiences, but rather it was on other areas to do with the use of digital technologies. Lastly, the studies presented in Table 4.1 set in international and regional contexts. Therefore, there is a need for studies (that use the UTAUT conceptual framing) to be conducted in the South African context, employing a qualitative approach and a specific focus on master's students as participants.

4.9 Critique of CHAT and UTAUT

4.9.1 CHAT

The CHAT is highly eloquent theoretical framework offering guidance on students' use of digital technologies when engaging in various activities in a socio-cultural context. However, it has been criticised for its terminological shortfalls. Garrison (2001), argues that the meaning of 'action' during an activity in CHAT is unclear. It is uncertain whether it is self-action, interaction or trans-action. This argument by Garrison (2001) suggests that the concepts or language used when discussing CHAT is not clear. This critique is also suggesting that ambiguity in language used in CHAT may confuse the reader who ultimately will not understand what CHAT entails. Yamagata-Lynch (2007) adds that there have been translation problems and debates regarding the concept 'object' which is used interchangeably by CHAT to refer to goal, or motive. However, readers may think of an object as something of material value. This study addresses such language issues by defining or explaining the 'Activity' and 'Object' concepts and how they relate to this study according to CHAT. Additionally, the study has adopted the third generation of CHAT from (Engeström, 2001), thus amending some concepts to best suit the study. For example, the concept 'subjects' is amended to 'Actors' to suit this study. Also, each CHAT concept is discussed to give meaning in relation to this study. Despite this criticism, this study sees CHAT useful as a theoretical framework: it offers relevant guidance on students' experiences of using technologies to achieve specified goals. In addition, the theory is applicable in guiding both professionalisation and socialisation processes to inform the personalisation experience of participants.

4.9.2 UTAUT

UTAUT has provided a strong insight into varying constructs and moderators that may affect individuals' behavioural intention of using of digital technologies. Chaputula (2016) and Donaldson (2011) identify that UTAUT has 70% explanatory and predictor power over variance in technology use intentions. The UTAUT is the only recent technology acceptance framework that has included the distinction between constructs that affects a person's behavioural intention, and the mediating role of moderators. Nonetheless, this conceptual framework is still criticised for ignoring users' personal characteristics such as personal motivation, self-discipline, and enjoyment-drive. Such traits can be argued to be essential when considering the adoption and acceptance of digital technologies (Donaldson, 2011). This study overcomes this framework's limitation by including and emphasising personalisation experiences of using digital technologies. Personalisation experiences leave room for users' individual characteristics that inform how they may use digital technologies. The UTAUT is thus able to accommodate personalisation actions of digital technology users.

4.10 Conclusion

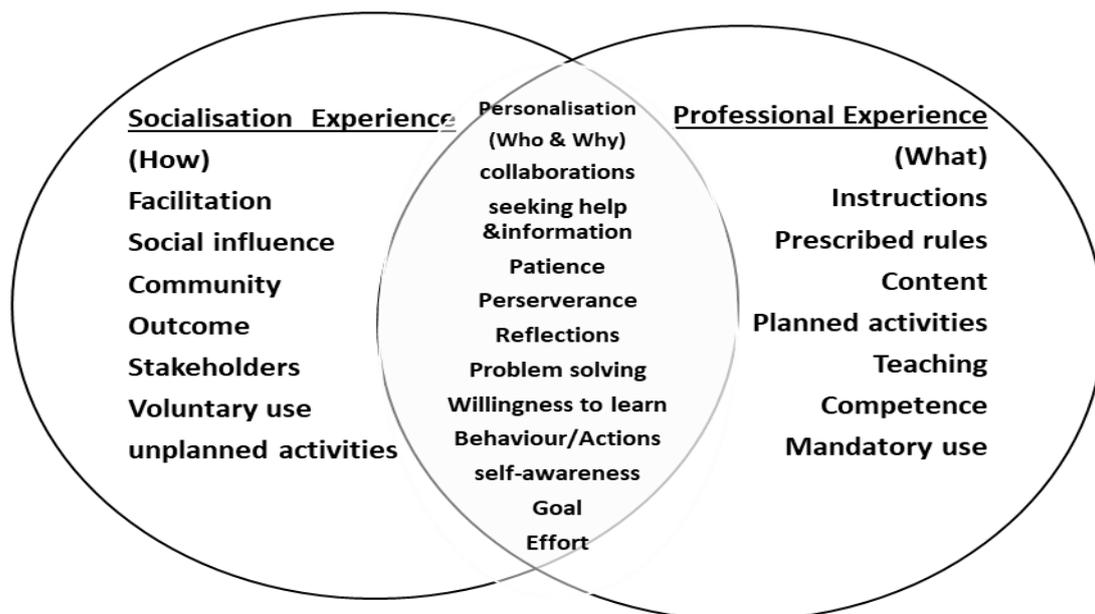


Figure 4.7: Persona-Tech analytical framework theorised using the concepts of CHAT and UTAUT regarding the use of digital technologies.

To conclude this chapter, the findings on CHAT and UTAUT were used to introduce a new analytical framework (Persona-Tech) relevant to the present study. The analytical framework visualised in Figure 4.7 above, is made up of concepts from both CHAT and UTAUT to aid in analysis of data generated from this study. The concepts have been grouped according to professionalisation, socialisation, and personalisation experiences. Therefore, master's students' use of digital technologies for research informs their personalisation experience as influenced by socialisation and/or professionalisation experiences to address individual needs.

Students have characteristics that help them to obtain quality personalisation experience in using digital technologies in research. These characteristics or values are grouped under personalisation experience, and include the effort students put into understanding each technology in use. Collaborations, finding assistance and knowledge, patience, problem-solving, desire to learn, self-awareness, and reflections are all factors which play a role in students' use of digital technologies. The '*What*' (professionalisation) question refers to the requirements needed for a master's research study. Such involves following formal procedures to understand the use of digital technologies (instructions, prescribed rules, content, planned activities, teaching, competence, mandatory use). The '*How*' (socialisation) question relates to how some of the social influences are incorporated into a research study. Such would include terms of use of digital technologies (facilitation, social influence, community, outcome, stakeholders, voluntary use). The '*Who and Why*' (personalisation) reflects the researcher's identity (in this case, the master's students) and rationale for using specific digital technologies in research. The '*Who and Why*' questions have been most relevant in the 4IR shift as they help students to find their identities and to self-actualise (Khoza & Biyela, 2019; Schwab, 2017).

The master's students (researchers) can learn how to use the vast digital technologies informally from the social influences of the community they are found in. Social influences have a high impact on voluntary use of digital technologies, and are further guided by facilitation from a peer, family member or any other persons within the researcher's community (socialisation experience). However, when the use of digital technologies is mandatory, specific instructions, prescribed rules, content and planning must be followed. Also, further teaching may be necessary for students to gain competence in using specific digital technologies for research (professionalisation experience). Thus, it is the researcher's (master's student) duty to identify and combine the strengths of both the experiences to create a unique personalisation experience informed by individual research needs.

CHAPTER FIVE

UNPACKING THE METHODOLOGICAL REALITIES OF THE STUDY

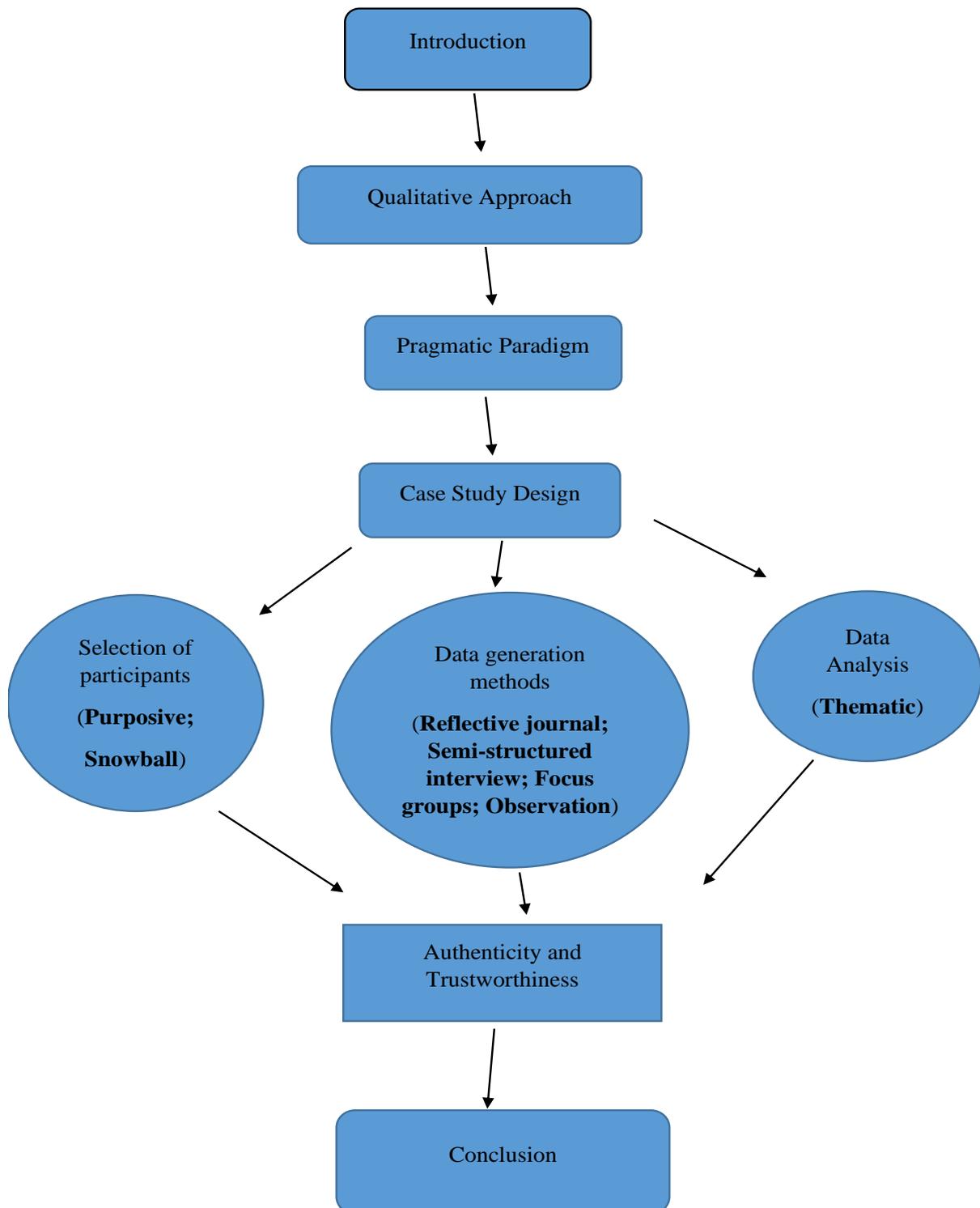


Figure 5.1: A structural outline of chapter five

5.1 Introduction

The previous chapter extensively discussed the theoretical (CHAT) and conceptual (UTAUT) frameworks that were employed by this study. CHAT was used as a primary theory that is a socio-cultural lens exploring the use of digital technologies in the construction of knowledge, and UTAUT as a secondary framework to unravel digital technology users' acceptance and beliefs about using various digital technologies. The theoretical findings and concepts from both CHAT and UTAUT were used to produce a new analytical framework for data analysis of this study. The analytical framework was formed by selecting concepts from both CHAT and UTAUT to yield a new philosophical lens to explore master's students' experiences of using digital technologies in research.

This chapter explores the research design and methodologies that were employed in this study. The discussion is necessary to uncover the purpose, approach and methods used to generate data about master's students' experiences of using digital technologies in research. In addition, this chapter begins by theorising the concepts of research methodology and design. Following that, is a brief overview of the research objectives and key questions of the study reminding the reader about the purpose of this research. Furthermore, there is a discussion on the philosophical paradigm (pragmatic) that was used in the study, followed by an elaboration of the methodological paradigm or approach (qualitative) which dominates the study. Case study research style is also negotiated together with the research methods and data analysis technique. Issues of authenticity and trustworthiness are substantiated in relation to the study. The following figure represents the approach that was used to discuss the above-mentioned issues that build up this chapter.

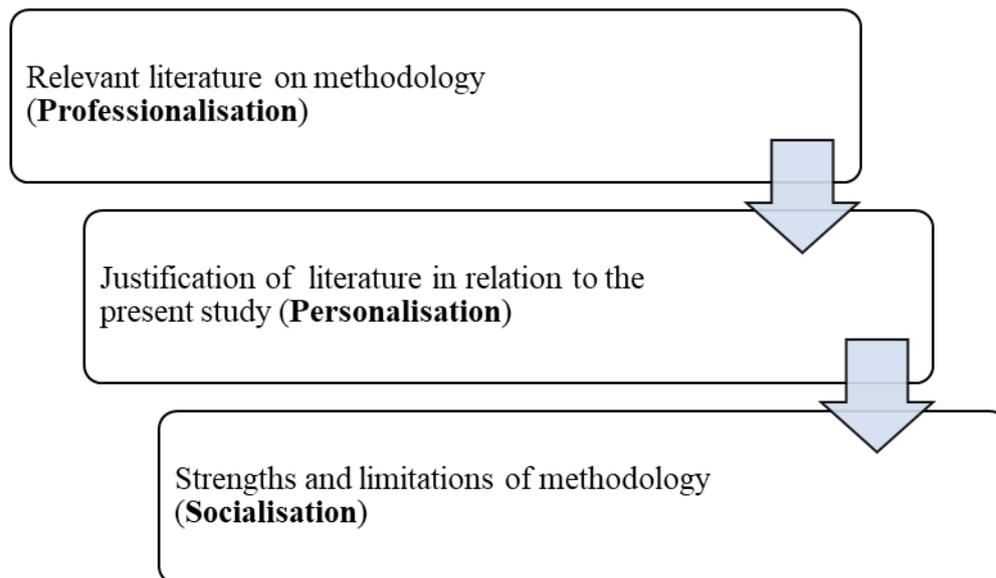


Figure 5.2: Flow chart representing the approach used to discuss key components of this chapter

5.2 Conceptualisation of methodology and design

Mamabolo and Tjallinks (2010), explain that research methodology refers to how research is conducted, including paradigms, generating data, organising, and analysing all information. Mohajan (2018) declares that research methodology indicates researchers' strategies and techniques used to address the objective and research questions of the study. Research methodology includes all the methods and analysis techniques that describe how the research was executed in a logical way to answer the key research questions. Research methodology provides substantiation and reasoning for conducting research a certain way to yield data about a particular phenomenon (Bricki & Green, 2007). Khothari (2004) identifies a research design as the entire plan for research methodologies to be used in a study. Thus, a researcher has to organise and plan for the research methods they choose to employ as part of their methodology.

5.3 Research purpose, Objectives and Questions

To remind the reader of the essence of the study, the following indicates research objectives and key questions of the current research.

5.3.1 Research objectives

5.3.1.1 To explore master's students' experiences of using digital technologies.

5.3.1.2 To explore how master's students apply their experiences of using digital technologies in research.

5.3.1.3 To understand why master's students experience digital technologies in particular ways.

5.3.2 Research questions

5.3.2.1 What are master's students' experiences of using digital technologies? (descriptive)

5.3.2.2 How do master's students apply their experiences of using digital technologies in research? (operational)

5.3.2.3 Why do master's students experience digital technologies in particular ways? (Philosophical/ Theoretical)

5.4 Philosophical Paradigm

5.4.1 Pragmatic paradigm

In educational research, the concept paradigm is used to explain the researcher's worldview (Mackenzie & Knipe, 2006). Kivunja and Kuyini (2017) declare that a research paradigm is a lens through which the researcher explores the world. Furthermore, Denzin and Lincoln (2008b) define the concept paradigm as a perspective that indicates where the researcher is coming from in constructing meaning embedded in research findings. Kivunja and Kuyini (2017) also suggest that a paradigm is a school of thoughts, shared beliefs, or perceptions that indicates the interpretation of research data. Arguably, research paradigms are essential in research because they provide a philosophical orientation of how a study should be conducted.

According to Bertram and Christiansen (2014), a research paradigm is a worldview that explains the suitable data generating methods and other research methodologies needed to conduct a particular study. Similarly, Guba and Lincoln (1994) allude to a paradigm consisting of a worldview that guides a research project according to the research design and methods employed. Kivunja and Kuyini (2017) also argue that a research paradigm is a conceptual lens through which the researcher explores the methodological features of a research project, thus determining methods that will be used for data analysis. One can then argue that a paradigm also reflects how data should be analysed and also highlights the appropriate methods of a

particular worldview. Therefore, a researcher must choose a paradigm applicable to the nature of the phenomenon (Ponelis, 2015). The choice of a particular paradigm in a study is essential because it guides researchers in understanding the explored phenomenon, data generation, and interpretation of findings (Davis, 2014). Moreover, the adoption of a paradigm into a study gives the research a worldview identity and removes ambiguities (Wolgemuth, 2016).

There are several research paradigms such as the positivist, critical, pragmatic and interpretive paradigms, to mention a few. As a result of paradigmatic dispositions, the present study made use of the pragmatic paradigm. Alise and Teddlie (2010), and Johnson and Onwuegbuzie (2004) argued that the separation of the qualitative (e.g., interpretivist) from the quantitative (e.g., positivist) paradigm orientation creates unnecessary ‘paradigmatic wars’. Alise and Teddlie (2010) further point out that a mono-paradigm approach is not enough. What is needed is a set of beliefs (worldview) that speak to the research problem. These beliefs do not have to be fixed to one research approach but must be most appropriate for exploring the phenomenon in question (Kivunja & Kuyini, 2017). Hence, the pragmatic paradigm ushers in a new era of a philosophical perspective that allows researchers to employ designs and methodologies most suitable to answer the key research questions; this without limiting them to a specific approach (Chaputula, 2016; Teddlie & Tashakkori, 2009).

When reviewing the background of the pragmatic paradigm, I found that its philosophical perception is embedded in the historical foundations of pragmatism that embrace plural methods to explore phenomena (Kaushik & Walsh, 2019). Kaushik and Walsh (2019) also posit that the concept of pragmatism is derived from the Greek word ‘pragma’, which can be translated to ‘something done’ in the English language, implying an action. Thus, the philosophy of pragmatism involves the study of human actions or behaviour (driven by experiences). Studying human behaviour propels researchers to discover meaning and understanding of people’s experiences (Biesta, 2010b). As a result of this worldview, researchers who make use of the pragmatic paradigm usually employ mixed methods to find and understand personalised meaning from participants’ experiences (Biesta, 2010a; Brierley, 2017; Denzin, 2010; Feilzer, 2010). Mixed methods methodology involves using qualitative and quantitative methods in one research study (Feilzer, 2010; Johnson & Onwuegbuzie, 2004; Shannon-Baker, 2016). Mixed methods draw from the strengths of both qualitative and

quantitative methods to answer the research questions (Johnson & Onwuegbuzie, 2004; Teddlie & Tashakkori, 1998).

In a study conducted by Paterson and Low (2011), the pragmatic paradigm was used to interrogate students' attitudes towards mobile library services for smartphones at the University of Edinburgh in the United Kingdom (UK). The study further used surveys and focus group discussions to gather 1,716 students' experiences. Survey methods were from the quantitative approach and focus group- qualitative. Mtshali (2015), reported that he used the pragmatic paradigm to explore 15 undergraduate students' experiences of using online support for a business management module at a particular university in South Africa. The study was initially only driven by qualitative methods (focus groups and in-depth interviews). However, owing to unforeseen biased findings triggered by the presence of the main researcher during data generation, the study had to additionally employ quantitative methods, excluding the main researcher from being part of the field experience. As a result, a neutral assistant researcher was found to disseminate online questionnaires to the students (quantitative). In this way, the study design changed to mixed methods. This research approach suggests that using the pragmatic paradigm provides researchers with the flexibility to use methods that are best suited to investigate or explore a problem of interest (Chaputula, 2016; Tashakkori & Teddlie, 2009). Furthermore, such flexibility creates space for researchers to amend their methods of collecting data, driven by the findings that emerge during data generation, as evident in Mtshali's (2015) study.

Therefore, pragmatism avoids 'paradigm wars' created by the strict discipline barriers that were formed between different paradigms (Creswell & Poth, 2016). Simply put, the pragmatic paradigm helps to address the contestation between socialisation and professionalisation of the paradigms. This paradigmatic orientation (pragmatic) therefore, was the most relevant for this study as it aims to bridge the gap between qualitative (socialisation) and quantitative (professionalisation) research. In this study, the pragmatic paradigm was also aligned with the personalisation experience. The pragmatic paradigm provides a neutral platform consisting of either qualitative or quantitative methods. In addition, the pragmatic paradigm accommodated participants' individual needs because they could draw from either professionalisation or socialisation experience regarding their personal use of digital technologies for research.

Research substantiates how much the pragmatic paradigm considers mixed methods methodology (Alise & Teddlie, 2010; Biesta, 2010b, 2010a; Brierley, 2017; Creswell & Creswell, 2017; Denzin, 2010; Feilzer, 2010; Johnson & Onwuegbuzie, 2004; Maxcy, 2003; Shannon-Baker, 2016; Teddlie & Tashakkori, 2009; Teddlie & Yu, 2007). However, this study is different in that it does not use mixed methods but employed the most suitable and relevant methods that helped in generating data to address research objectives. The study thus made use of four methods (reflective journals, semi-structured interviews, focus group discussions, and observations) strongly driven by the qualitative approach to generate findings (to be discussed later in the chapter). As Morgan (2014) argued, the pragmatic paradigm also promotes the use of the most suitable and practical methods to aid in the attainment of research objectives. This allusion suggests that the pragmatic paradigm enables researchers to choose the most effective methods to answer the research questions; whether it be multiple methods, single methods or mixed methods (Teddlie & Tashakkori, 1998).

Armitage (2007) maintains that in the pragmatic paradigm, researchers can use bilingual nomenclature derived from qualitative and quantitative terms. Tashakkori and Teddlie (2002) also believe that several terminologies from different approaches can be used within the pragmatic paradigm. The common use of terminologies suggests that the pragmatic paradigm is inclusive of the various concepts derived from qualitative and quantitative methodological paradigms or approaches. By virtue of the pragmatic paradigm, I was not restricted in terms of the concepts I used to describe the methodology and findings of the study. Operating within the pragmatic paradigm enabled me to use research concepts from any approach to address various aspects of the study. Kaushik and Walsh (2019) posit that every paradigm has unique perspectives in its epistemological and ontological groundings. Therefore, it is necessary to negotiate the epistemological and ontological dispositions of the pragmatic paradigm.

5.4.2 Epistemological perspective of the pragmatic paradigm

Edirisingha and Materiality (2012) pronounce that epistemology reveals how researchers uncover knowledge about participants' realities. Crotty (1998) argues that epistemology is the explanation and understanding of how one knows what one knows. Therefore, the epistemology of a paradigm provides a philosophical grounding for the kind of knowledge that fits into a particular reality to ensure the adequacy and legitimacy of findings (Ahmed, 2008).

Epistemology, therefore, reflects knowledge, assumptions and beliefs about participants' truths embedded in each paradigm. A researcher can thus use the epistemological perspective to broaden understanding of a particular topic or problem.

Epistemology in the pragmatic paradigm emphasises that participants' knowledge of issues must be discovered using approaches deemed appropriate by the researcher (Kivunja & Kuyini, 2017, p. 35). Similarly, Johnson and Onwuegbuzie (2004); Morgan (2007) assert that researchers can use any method that is effective in exploring participants' knowledge about their realities. To discover epistemological truths, this study used methods that were best suited to help in gaining knowledge about participants' realities of using digital technologies in research. For instance, I used focus group discussions for participants to socially construct knowledge about their realities, in which they shared their stories by conversing with me (researcher) and with one another about their experiences. Bearing in mind the epistemological positioning of the pragmatic paradigm, it is equally pivotal to discuss the ontological assumptions established in this study.

5.4.3 Ontological perspective of the pragmatic paradigm

Ontology refers to the nature of reality regarding a particular paradigm (Hudson & Ozanne, 1988). Edirisingha and Materiality (2012) further highlight that ontology deals with the whole nature of existence of phenomena. Ontology seeks reality by referring to a particular type of knowledge that exists which is external to the researcher. Moreover, the ontological assumptions of any paradigm respond to the questions: what is there to be known? or what is the nature of reality of a phenomenon? (Guba & Lincoln, 1989). Therefore, the ontological underpinnings of the pragmatic paradigm indicate that reality is not static- it evolves according to individual experiences (Kaushik & Walsh, 2019). The pragmatic paradigm, therefore, stresses the concept of multiple realities open to empirical study, differing from person to person (Creswell & Clark, 2017). Thus, human actions are not separate from experiences. Actions are reflections of human experiences, and every human acts uniquely in situations they experience. Therefore, people are internally, personally, or intellectually driven to produce new action with limited influence of external factors. Thus, the ontological positioning of this study was to explore and generate findings on the personalised experiences of each master's student when using digital technologies for research purposes. To obtain such realities, I probed the

participants during semi-structured interviews and focus group discussions, using the information they had indicated in their reflective journals.

5.4.4 Strengths of the pragmatic paradigm

According to Brierley (2017), and Johnson and Onwuegbuzie (2004), the pragmatic paradigm provides fewer philosophical assumptions. A researcher can therefore conduct a study in terms of its research objectives. Supporting the above statement, Morgan (2007) negotiates that the pragmatic paradigm provides a middle position and flexible methodologies for both qualitative and quantitative research. Participants' personalisation experiences (as shaped by socialisation and professionalisation) were used to address the study objectives. Thus, the pragmatic paradigm enabled me to generate data using methods driven by the qualitative approach. However, the pragmatic paradigm also created space for quantitative techniques for participants whose personalisation experiences were highly influenced by professionalisation. Particularly with the reflective journal, I included structured questions so that when some participants were not comfortable providing detailed reflections about their experiences, they were accommodated by the closed-ended questions. This method produced numerical results that were still accommodated within the pragmatic paradigm. I also used participants' structured responses to further probe them during individual interview sessions. The pragmatic paradigm is useful because it neutrally combines diverse methods in addressing a particular research problem (Teddlie & Tashakkori 2009).

5.4.5 Limitation of the pragmatic paradigm

Tashakkori and Teddlie (2002) argue that the pragmatic paradigm is a confusing paradigm that mixes methods and is not clear on the level of mixed methodologies from either the qualitative or quantitative approach. Equally, Burrell and Morgan (2019), Guba and Lincoln (1988), and Denzin (2010) concur that paradigms should not be mixed, this possibly fostering confusion to the reader in terms of the positioning of a study. Contrary to this, Patton (2002) negotiates that the pragmatic paradigm is useful because it recognises participants' realities, thus seeks sensible and creative ways to explore these realities. The pragmatic paradigm proves the awareness of the various assumptions, beliefs and approaches used to interrogate the personalised realities of what people experience (Armitage, 2007). It can be suggested that the pragmatic paradigm stimulates creativity to explore participants' experiences, driven by the aim of attaining study objectives. Hence, to overcome the "confusion" that could have

transpired as a result of using the pragmatic paradigm, I explained in detail all the methods, and procedures followed when I was conducting the study, using reflective journals, semi-structured interviews, focus group discussions and observation. I also provided pertinent substantiation for using these methods, considered the most suitable in exploring participants' experiences. Research design negotiates not only the philosophical paradigm but also the approach used to explore a specific phenomenon. This suggests the need to discuss the methodological paradigm or approach that was employed in this study.

5.5 Dominating Methodological Paradigm or Approach: Qualitative

Mohajan (2018), argues that every study should have a systematic, discipline-oriented and explicit approach that is the most effective in generating appropriate findings about a specific phenomenon. Eyisi (2016), emphasises that educational researchers can choose between quantitative (numerical) and qualitative (textual) research approaches based on the kind of findings they wish to obtain. This study operated predominantly under the qualitative approach, which Moriarty (2011) discusses as providing a detailed and in-depth understanding of the social world of participants. This approach further allows participants to draw from their real-life experiences. In a similar way to Moriarty discussion, Golafshani (2003) contends that the qualitative approach provides thorough data from real-world experiences. The explored phenomenon unfolds naturally from a participant's opinion, thoughts, and feelings. Creswell and Creswell (2017) argue that qualitative approaches allow researchers to 'dig' into participants' experiences in order to describe, interpret and understand their subjective behaviour pertaining to specific events. In this way, a researcher is able to provide a personal reflection about a particular phenomenon. In a qualitative study, a researcher can interpret participants' practices in order to share personal meaning from the findings (Denzin & Lincoln, 2008a; Punch, 2013). In this study, I employed the qualitative approach to understanding master's students' experiences of using digital technologies in research. Furthermore, I selected the approach to provide in-depth and detailed analysis of master's students' experiences of using digital technologies (personalisation experience). Qualitative studies describe people's experiences, feelings, perspectives and thoughts regarding social issues (Naderifar, Goli, & Ghaljaie, 2017).

Bricki and Green (2007) aver that the qualitative approach generates data using words for analysis. Golafshani (2003) also mentions that the qualitative approach generates textual and interpretive data mainly consisting of descriptive findings. Textual data consists of written paragraphs, diagrams, charts and pictures that researchers use to describe participants' experiences (Creswell, 2009). Therefore, qualitative research generates data that focuses on participants' various ways of viewing reality that they articulate in their own words (Hancock et al., 2001). It is the researcher's responsibility to gather meaning, deep insights, and understanding about participants' expressed realities (Hammarberg et al., 2016). Other researchers' roles are to ask, listen, observe, probe, and explain participants' perspectives per thick descriptive data to foster interpretation and deep understanding (Creswell, 2007). Providing descriptive data allows researchers to tell a story in words focusing on detailed narratives of participants' personal worlds (Sutton & Austin, 2015). This study provided in-depth textual data that aimed to understand of the master's students' experiences of using digital technologies in research. This way of conducting research further suggested the relevance of the qualitative approach in the current study. Furthermore, qualitative research uses inductive reasoning in which researchers generate data and then derive explanations from data findings. Arguably, this approach makes conducting research more explanatory enabling researchers to provide descriptive insights into participants' feeling and experiences.

Mohajan (2018) also believes that qualitative research aims to study human behaviour in relation to an identified issue. Any study that involves the exploration of human behaviour is therefore most effective when it occurs in the natural setting, where it develops an intense degree of detail (Creswell, 2009). Contextual approaches such as the qualitative describe participants' life experiences in natural settings to provide meaningful insight (Gentles, Charles, Ploeg, & McKibbin, 2015; Grove, Burns, & Gray, 2012). In this study, I generated data at the university in which the participants were enrolled. This was the setting they were familiar with. It was also a context in which master's students were often found, as they accessed some research resources at the university. The participants also agreed to have their interview sessions conducted at the university, this being a setting they used mostly for their research needs. I made appointments for each of our meetings (semi-structured interviews) at a time that was convenient to the participants.

Bricki and Green (2007) also emphasise that the qualitative approach aims to answer questions about ‘what’, ‘how’ and ‘why’ regarding a particular phenomenon. Similarly, Guest, Namey, and Mitchell (2013) postulate that qualitative research addresses the ‘how’ and the ‘why’ questions on human behavior and experiences. Thus, as a qualitative researcher, being able to answer how and why people experience matters in particular ways foster appropriate reasoning and meaning on the findings of the study (Eyisi, 2016). This study developed three key questions consisting of the ‘what’, ‘how’ and ‘why’ questions, therefore the qualitative approach was deemed most suitable in providing substantiations, interpretations and meaningful inferences about participants’ experiences. Nonetheless, the question “what are master’s students’ experiences of using digital technologies in research?” was also used to identify and address qualitative and quantitative issues that emerged from the participants, based on their personalisation needs.

For instance, I could identify how many master’s students used the same digital technologies. Additionally, I could also analyse participants’ experiences according to socio-demographics, such as age, and gender as propelled by the study’s analytical framework. Findings and analysis of the above nature produce some numerical findings that are accommodated by the quantitative approach. It should also be pointed out that research questions must be considered when selecting the paradigm, approach, and methods to use in a study (Chaputula, 2016). Parallel to this discussion, Mtshali (2015) stresses the essence of separating methods and findings according to key research questions. The decision to deploy the qualitative approach as dominant was influenced by Questions 2 and 3 of the key research questions producing a large amount of in-depth and textual data. As a result, thick, linguistic and descriptive findings dominated this study, hence the application of the qualitative approach.

5.5.1 Strengths of qualitative approach

Ospina (2004) discusses multiple strengths of employing a qualitative approach, which include following unexpected ideas, hence exploring experiences much more effectively. Aspers and Corte (2019) add that qualitative studies are conducted to generate in-depth philosophical meaning; as a result, new concepts and theories can be developed useful for future research. Therefore, qualitative studies offer advantages that may enhance the understanding of many complex realities that happen in the participants’ social, professional, and personal experiences. During fieldwork, I made conversations with participants and generated first-hand data within

participants' natural settings. In this way, I could simplify questions for participants to understand better, and probe further to gain more details about their responses.

This strength suggests that the approach supported the socialisation experience as I generated qualitative data in a dialogical manner from participants. Furthermore, by probing participants during the data-generation process (interviews and focus group discussions) I gained ideas that I explored more profoundly, and identified other experiences, such as participants' professionalisation, socialisation, and personalisation experiences as informed by their needs.

5.5.2 Limitation of the qualitative approach

Using the qualitative approach comes with strengths and some notable limitations. Bricki and Green (2007) therefore project that, with qualitative research, it may be difficult to state the objectivity of the researcher on the study findings. Researchers are involved in the field when generating data through conversations with participants. To overcome this limitation in this study, I used four data-generation methods to triangulate and validate findings, ensuring their trustworthiness. Pragmatic research does not subscribe either to the subjectivity or objectivity of researchers - it holds the middle position between qualitative and quantitative approaches. Ochieng (2009) argues that the language written by researchers to express their analysis of findings may sometimes become ambiguous to the reader. To avoid ambiguities, I used participants' direct verbatim from which to draw my interpretation. In addition, I used simple English words to convey the relevant messages from each finding. Conducting an empirical study that is dominated by the qualitative approach allowed me to explore participants' experiences in detail. However, I also needed to use a particular research style to support my study design. Hence, discussing the case study research style became necessary to expand on the present study design.

5.6 Case study research style

According to Meyer (2001), the case study research style has been widely used in organisational studies such as in the social sciences. Hyett, Kenny, and Dickson-Swift (2014) add that case studies have increasingly become popular in qualitative research, shaped by the chosen paradigm and study methods. Furthermore, Ponelis (2015) discusses that the use of the case study research style has gained vast practise and acceptance in education and doctoral

studies. Cohen, Manion, and Morrison (2011) hypothesise that case studies provide a thick description of participants' experiences including their thoughts and feelings. In addition, Cohen et al. (2011), and Ponelis (2015) further contend that the purpose of a case study is to provide a holistic and intensive description and analysis of a case bounded to a specific context, thereby giving insight into real-life situations. Since the qualitative approach dominated this study, I considered the case-study research style suitable. This style enabled me to analyse and understand participants' personalised experiences in order to provide in-depth and detailed data. This in-depth generation of data is aligned with the methodological and philosophical paradigm selected for this study (qualitative and pragmatic).

In the same spirit of alignment with the dominating approach, Yin (2017) also stipulates that a case study aims to answer questions such as 'how' and 'why' to provide in-depth data. Yin (2003) states that phenomena in case studies are explored over time to provide detailed data with meaning. Phenomena are studied over time in order to provide detailed, context-rich data. Cohen, Manion, and Morrison (2007, 2013) opine that case studies display a close view of reality and a detailed description of 'what it's like' to be in a particular situation. This study also sought to understand how and why master's students use digital technologies in particular ways in their research to provide more detailed data. Thus, I deliberately selected the case study research style as it fits best with the qualitative approach.

Baxter and Jack (2008), also affirm that case study research is useful when seeking to answer real-life phenomena made of complex realities. The 'cases' in a case study are based on participants' personal experiences regarding certain issues (Johansson, 2007). Gustafsson (2017) elaborates that case studies are more appropriate for research attempting to gain a deeper understanding of the explored phenomenon. Understanding participants' personal experiences to foster an in-depth understanding aligns with the intentions of this study. There being several types of case studies, the types should be highlighted, indicating the most relevant to this study.

5.6.1 Different types of case studies

The above discussion reflects that case studies are one of many ways of conducting research studies that aim to understand human behaviour and personal realities. Yin (2003, 2009, 2017) postulate that there are many types of case studies such as single, explanatory, instrumental, descriptive, multiple, exploratory and collective case studies. Three major case studies include

the descriptive, the explanatory, and the exploratory case studies. For the purpose of this study, I only discuss the three major case studies, these being the main categories of case study research. In addition, I briefly discuss the first two major case studies (descriptive and explanatory). I later expand more on the exploratory case study, this was deemed appropriate for the current research.

To begin with, descriptive case studies describe a real-life phenomenon in the context in which it occurs (Baxter & Jack, 2008; Merriam, 1998). Cohen, Manion, and Morrison (2007, 2013) aver that descriptive case studies give a thorough account of participants' personal narratives which are obtained in-depth from their experiences. Similarly, Marsella (2018) observes that descriptive case studies reflect participants' detailed involvement with a particular experience. In descriptive case studies, the researcher has to observe participants' experiences unfold in their natural settings (Zainal, 2007). The researcher, therefore, has to be present in the field to witness participants' experiences unfold. The researcher can then develop a document that fully illustrates these experiences (Armfield, 2007; Stake, 2005). Yin (2011) presumes that descriptive case studies are useful for research seeking to answer the 'what' question on the explored phenomenon. In other words, descriptive case studies present greater detail of a phenomenon within its context.

Explanatory case studies seek to understand 'how' and 'why' an experience has occurred in a particular way (Yin, 2003). Yin (2011) also emphasises that explanatory case studies provide explanations and in-depth data to answer the 'how' and 'why' questions regarding a specific phenomenon. Through explanatory case studies, the researcher is able to explain and make causal links on participants' complex realities (Baxter & Jack, 2008; Yin, 2003). Explanatory case studies explore how events happen. They also reveal which ones are influenced by particular outcomes (Hill, 2017).

In exploratory case studies, phenomena are explored, the outcome as yet unknown (Baxter & Jack, 2008; Yin, 2003). In support of this statement by Baxter and Jack (2008) and Yin (2003), Swedberg (2018) concurs that it is not easy to predict the outcome in exploratory studies. Researchers have to generate detailed data from participants' experiences before establishing any conclusions. This kind of exploration enables researchers to interrogate the topic deeply, by probing for more information from participants to generate detailed data (Zainal, 2007). Each exploratory case study's focus is to investigate participants' experiences driven by their

personalised perspectives, thoughts, and feelings to make new interpretations, theories, and conclusions (Swedberg, 2018).

Exploratory case studies are used mostly to frame future research (Yin, 2003). Researchers utilising exploratory case studies therefore have to generate thick data that they understand in order to be able to produce a theory that can guide future research (Zainal, 2007). The current study used an exploratory case study because it wanted to learn more about master's students' experiences with digital technologies. Such learning can foster in-depth understanding about students experiences. In other words, the study sought to understand master's students' experiences to indicate their personalisation experiences (as cases), which may lead to the production of new theories or recommendations for future research. This is a doctoral study whose main aim is to theorise findings, producing a new theory that may impact on future research. This aim further justifies the relevance of the exploratory case study for this research.

5.6.2 Exploratory case study in empirical research

Widespread research has been conducted using exploratory case studies (Hill, 2017; Lumpkin, 2012; Margarella, 2016; Ponelis, 2015; Swedberg, 2018; Urbinati, Chiaroni, Chiesa, & Frattini, 2020). Specifically, within exploring the experiences of using digital technologies, Hardman (2005a) conducted an exploratory case study to investigate students' use of digital technology in a mathematics classroom. Using the same methodology, Lumpkin (2012) explored lecturers' experiences of using digital technologies in a teacher education programme. In both exploratory case studies, participants were aware of the impact of technological innovation in their professionalisation experiences. In Lumpkin's (2012) research, the exploratory case study was used to provide a holistic description and analysis of how lecturers experienced the innovation of Web-based learning and LiveText digital technologies for teaching and learning.

Another exploratory case study by Margarella (2016) reported on the use of digital technologies (iPads) for sharing subject content and instructions (professionalisation) by three English teachers in the United States. The researcher used the exploratory case study together with observation and interview methods to generate rich data on participants' experiences of using iPad digital technologies. These teachers indicated that the devices posed challenges in classroom practice as teachers were not professionally trained on how to incorporate them into the classroom. An exploratory case study was recently conducted in Italy to show how nine

companies operating in different industries manage knowledge and information flows (Urbinati et al., 2020). Aligned with the exploratory study's aims of producing in-depth data, the study utilised a 90-minute interview to generate findings from twelve managers of each company. What is missing from the presented accounts of literature is that they (studies) do not indicate the philosophical lens (paradigm) in which the exploratory case studies are positioned (Hardman, 2005a; Lumpkin, 2012; Urbinati et al., 2020). This study bridged the gap by using an exploratory case study methodology within clear stipulations of the pragmatic paradigm to avoid ambiguities in the philosophical assumptions of the study.

5.6.3 Strengths of using exploratory case studies

After I have positioned this study firmly within exploratory case study research, it is pivotal to review the strengths bestowed by this methodology. Meyer (2001) argues that exploratory case studies provide the advantage of a holistic view that enables the researcher to study various aspects of a phenomenon such as beliefs, assumptions, and identities of participants to draw conclusions. Hyett et al. (2014) purport that exploratory case studies provide useful insights to refine or add to theory, thus advancing understanding a particular phenomenon. In a similar way to Hyett et al. (2014), and Siggelkow (2007) attest to exploratory case studies richly describing a phenomenon to aid in understanding. Thus, the use of exploratory case study helped me obtain thick and detailed data about master's students' experiences, aiding in understanding these experiences. The use of an exploratory case study also helped in identifying unique features such as participants' personalisation experiences of using digital technologies in their master's research studies.

5.6.4 Limitation of exploratory case studies

The employment of an exploratory case study methodology in research does not only come with the above-mentioned strengths - it also comes with some limitation(s). Cohen et al. (2013), Hyett et al. (2014) and Gustafsson (2017) concur that using exploratory case study methodology does not provide a specific/ uniform way in which to present findings. Gustafsson (2017) also stipulates that exploratory case studies do not develop testable generalisation; thus, they are usually criticised for not being scientific enough. To address issues of uniformity in data presentation, I used thematic analysis to present and analyse study findings. This approach provided a systematic way of data presentation. In relation to scientific generalisation, it is

essential to note that this is not a quantitative study, but one that is qualitative, and not aiming to generalise the findings.

5.7 Selection of Participants

According to Naderifar et al. (2017), selection of participants is a process by which a researcher chooses the participants of the study. Martínez-Mesa, González-Chica, Duquia, Bonamigo, and Bastos (2016), propose that participants are selected as suitable subjects to respond to the area of interest to the researcher. Particularly, in qualitative studies, the researcher has to find participants willing to share their perspectives, experiences or views about a specific phenomenon. Maree (2007) enlightens that in qualitative research, participants are selected by the researcher to obtain rich and comprehensive information which answers the research questions. Furthermore, choosing participants for a study is an essential step in any research (Marshall, 1996). In this study, I also had to follow specific methods in selecting fourteen master's students to share their experiences of using digital technologies in research.

Naderifar et al. (2017) further note that the methods of selecting participants are performed in either two ways probability, and non-probability sampling. According to Naderifar et al. (2017), in probability sampling, the researcher chooses a sample that represents a larger population. The results of a study can be used to generalise to the whole population. Examples of probability sampling include simple random, stratified random, systematic and cluster random sampling (Elfil & Negida, 2017). Non-probability sampling involves selecting participants available to the researcher; and generalisation of findings is not a requirement. Non-probability sampling requires a researcher to select a particular portion of a wider population to be involved in the study (Cohen et al., 2011). This population sample is expected to share experiences of a specific issue in order to generate thick data. There are many non-probability sampling methods from which one can choose. These include purposive, convenience, quota, and snowball sampling (Etikan, Musa & Alkassim, 2016). In this study, I employed purposive and snowball sampling to access master's students as participants (purposive-snowballing). The figure below represents the integration of purposive snowballing in order to obtain fourteen master's students that fully participated in the study. The study had anticipated to sample fifteen master's students. However, owing to some participation withdrawal discussed below, there were ultimately fourteen participants willing to participate.

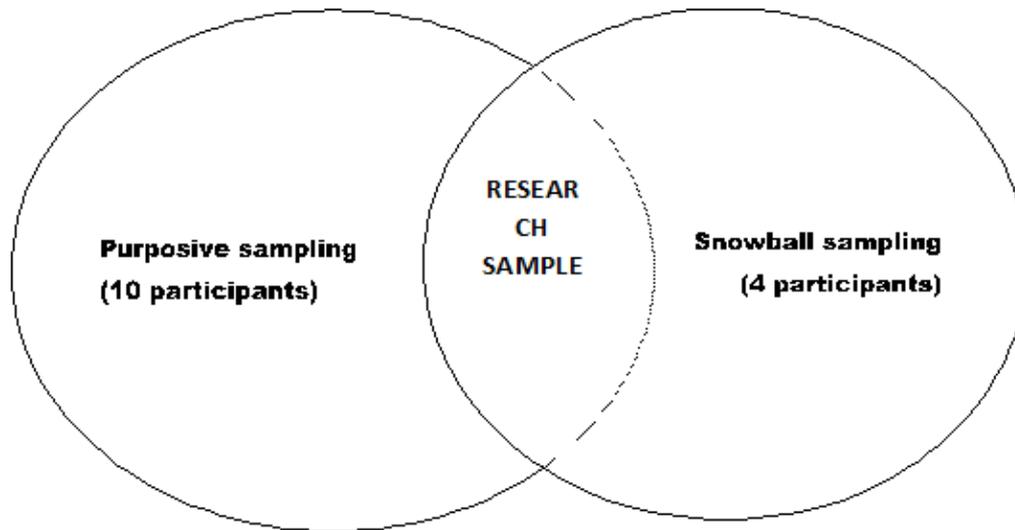


Figure 5.3: A visual representation of purposive snowballing as employed in this study

Arcury and Quandt (1998) posit that sample size involves the number of participants from which data is generated. Nayak (2010) emphasises that the number of participants varies according to the type of study objective and design. Marshall (1996) further notes that the suitable number of participants must be chosen to address the research question(s) sufficiently. Vasileiou, Barnett, Thorpe, and Young (2018) argue that the number of participants should be great enough to present a thick understanding of a phenomenon but also small enough to present deep case-oriented analysis in qualitative studies. Tuckett (2004) concurs that qualitative studies usually implement small numbers of participants to generate rich, in-depth, and detailed data about a particular phenomenon. Ritchie, Lewis, Nicholls, and Ormston (2013) add that qualitative studies that use the interview method should have fewer than fifty participants, so that the researcher can manage the complexity of analysing data. Thus, the participation of fourteen master's students was deemed manageable for this qualitative study.

In addition, in this study, I selected master's students enrolled in Tempo University (pseudonym), School of Education (SOE), which has multiple disciplines of research studies. As already discussed above, I purposively selected ten Master's in Education (M.Ed.) students (with four snowball sampled) across disciplines offered at the institution. I was only exploring the experiences of using digital technologies, which is a uniform practice across disciplines.

Hence, the students sampled in this study were from disciplines such as Curriculum Studies (CS), Education Leadership and Management Policy (ELMP), Social Sciences Education (SSE), Teacher Development Studies (TDS), Educational Psychology (EP), Science and Technology Education (SATE), History Education Studies (HES), Languages and Media Studies (LAMS), Gender Education (GE) and Mathematics and Computer Science Education (MACSE), respectively.

Trotter II (2012), discusses the limitation of using a small number of participants in that it creates concern over the generalisability of the study findings. However, generalisation of data is not a component of qualitative research. The table below presents participants profiles.

Table 5.1: Representing a Summary of participants’ profiles

Participant Name	Age	Gender	Discipline	Stage in master’s research
1. Dudu	36-40	Female	Maths and Computer Science Education	Generating data
2. Jessie	20-25	Female	History Education Studies	Submitted, waiting for results
3. Akinola	26-30	Female	Curriculum Studies	Finalising dissertation
4. Nthabi	26-30	Female	Curriculum Studies	Finalising dissertation
5. Sinowethu	20-25	Male	Social Sciences Education	Generating data
6. Rose	26-30	Female	Gender Education	Finalising dissertation
7. Joseph	20-25	Male	Language and Media Studies	Finalising dissertation

8. Crystal	26-30	Female	Teacher Development Studies	Generating data
9. Thabo	20-25	Male	Gender Education	Writing literature review
10. Gcinile	26-30	Female	Social Sciences Education	Proposal writing
11. Shawn	26-30	Male	Science and Technology Education	Submitted, waiting for results
12. Nkosi	26-30	Male	Gender Education	Finalising dissertation
13. Moosa	26- 30	Male	Maths and Computer Science Education	Finalising dissertation
14. Azania	36-40	Female	Curriculum Studies	Submitted, results received

5.7.1 Purposive sampling

The study made use of purposive sampling as a method of accessing and recruiting the initial group of participants to be part of the study. According to Tongco (2007), purposive sampling is a type of non-probability sampling that is very effective in studying the experiences of a targeted group of people in relation to a specific topic. Yin (2015), adds that purposive sampling involves the selection of participants based on their identified relevance and rich experience that can contribute towards answering a study's research question(s). The researcher has to make a deliberate choice of participants who are willing to provide quality information about their experiences of a specific phenomenon (Bernard, 2017). Using purposive sampling signifies that a researcher employs a strategic choice about with whom, where and how to conduct their research in order to meet their study objectives (Palys, 2008).

Palinkas et al. (2015), further argue that purposive sampling is widely used in qualitative research because of its strategy in selecting information-rich participants required for the production of in-depth data. Similarly, Gentles et al. (2015) postulate that, over the years, purposive sampling has gained prominence in qualitative research, with major significance in case study methodology. This is because purposive sampling gives researchers the opportunity of intentionally selecting participants who can provide rich cases about a particular research topic (Patton, 2014). The information-rich cases provide a great deal of knowledge and experience which a researcher can use to address the purpose of enquiry (Patton, 2014). Max Van Manen (2016) posit that purposive sampling used in qualitative research allows for the selection of participants based on their knowledge and verbal eloquence to describe their experiences in relation to the explored phenomenon.

In a qualitative study conducted by Makumane (2018) purposive sampling was used to recruit five teachers to share their enactment strategies of an integrated curriculum in Lesotho. The teachers shared their enactment experiences through reflective journals, semi-structured interviews and observations. This study used purposive sampling with the support of convenience sampling to recruit relevant participants. However, purposive sampling is not only employed in qualitative research. Etikan, Musa, and Alkassim (2016) further explain that purposive sampling is a method that is applicable to both quantitative and qualitative research approaches.

Idoniboye-Obu (2013) conducted a study solely using purposive sampling to target 139 PhD students, generating data about their use of online library resources at a particular university in South Africa. This study employed both qualitative and quantitative approaches (mixed methods) to generate findings further using questionnaire and interview methods. The studies above (Makumane, 2018; Idoniboye-Obu 2013) validate that purposive sampling is employable in qualitative and mixed methods studies involving both qualitative and quantitative approaches. Nonetheless, these studies either use purposive sampling independently (Idoniboye-Obu, 2013) or with convenience sampling (Makumane, 2018). In addition, many other studies make use of the popular combination of convenience and purposive sampling to select the most accessible participants to address their research needs (Chikoko, 2015; Khoza & Biyela, 2019; Khoza & Mpungose, 2018; Ngubane-Mokiwa & Khoza, 2016). This study was different in that it used purposive sampling together with

snowball sampling to gain participants. In this way, purposively identified potential participants (10) could further recommend other master's students (5) in order to meet the required number of participants (15) for the study.

When using purposive sampling, the researcher must understand that the available participants need to be willing to participate in the study (Bouida et al., 2016). Furthermore, the willingness and availability to participate in a study suggest that participants can share their experiences, opinions, and perspectives freely, being fully aware of their contribution (Bernard, 2007). It is essential to consider an ethical consent and strategic approach when recruiting participants through purposive sampling. This implies that once the target group has been identified, the researcher has to be strategic when inviting participants to be part of the study. In other words, they need to present their study to interest the potential participants and make them willing to be part of the study. Therefore, after I had purposively identified potential participants in various areas of the campus (research commons, ICT mentorship workshops, and campus residences), we informally discussed our research studies, indicating the topics and stage of study currently at. I further convinced prospective participants to be part of the study after capturing their interest in my research.

Although, efforts were made to recruit fifteen participants purposively for the study, I was only able to recruit **ten** participants as the initial cohort. The research commons is a well-appointed space provided for master's and PhD students to engage with their research activities (Daniels, 2010). It is a space fully equipped with digital technologies such as computers, Internet connections and printers to help students with their studies. Thus, the research commons provided an open space for me to recruit participants: most master's students use it to conduct their research projects. I could thus access **four** master's students which I sought for participation in the study. I also invited to participate in the study **three** potential participants at one of the ICT workshops held on campus by the subject librarians. I purposively targeted the research commons and the ICT workshops because I knew that these were guaranteed spaces where I could meet potential participants. Finally, I met the remaining **three** master's students on one of the campus residences. I purposively identified them because I was also on campus and could easily approach them there.

Altogether, I recruited **ten** participants through purposive sampling. I was able to choose master's students across disciplines and at different stages of their research. The expectation was that each participant would bring their unique experiences of using digital technologies at whatever stage of research they were in. The use of digital technologies is not specific to any discipline. Such technology is uniformly practised across all disciplines in the School of Education (SOE). Even though- purposive sampling enabled me to select and recruit ten participants, this was still an insufficient number. Participants targeted were fifteen for the study. Snowball sampling was used to supplement purposive sampling, in order to reach the required number of participants. However, before discussing snowball sampling as used in this study, it is important to also evaluate the strengths and limitations of purposive sampling.

5.7.2 Strengths of Purposive sampling

Purposive sampling has been useful in qualitative research because it helps with obtaining a better understanding of the studied phenomenon (Palys, 2008). The enhanced understanding comes of the researcher selecting participants rich in experience, and those who are well informed on the phenomenon of interest (Etikan et al., 2016). Purposive sampling benefited this study because in-depth textual data was generated from master's students who were willing to expand their knowledge and experience on using digital technologies in research. In this way, I could learn a significant amount about master's students' unique personalisation experiences regarding the use of digital technology in research. Such further enabled me to foster appropriate, understanding, interpretation, and analysis of findings.

In addition, purposively recruiting master's students in my location (campus) did not require me to travel or spend money to identify them. As a result of this cost-effectiveness, purposive sampling became one of the most relevant selection methods for this study.

5.7.3 Limitation of purposive sampling

While others advocate the use of purposive sampling in research, Sharma (2017) by contrast, highlights a limitation posed by the use of this sampling method. Sharma (2017) argues that purposive sampling is prone to bias by a researcher, they being responsible for judging suitability for the study. To address the issue of bias in this study, master's students not purposively identified by the researcher were provided a chance to be part of the study by being

nominated by participants already recruited (Snowball sampling). This combined use of the two methods of sampling (purposive and snowballing) ensured that fourteen master's students were recruited to generate thick data to answer the key research questions. Therefore, snowball sampling strengthened purposive sampling by expanding the opportunities for other potential participants to be part of the study (further discussed below).

5.7.4 Snowball sampling

In this study, the second method used to find participants was snowball sampling. According to Heckathorn (1997), snowball sampling was initially introduced by Coleman (1958), and later extended by Goodman (1961) as a convenient method of seeking people's participation in a study through nominations or referrals. Dragan and Isaic-Maniu (2013) articulate that snowball sampling is a method by which a researcher identifies participants based on specific characteristics. These participants in turn, recommend or indicate other participants that may be willing to participate in the study. As Browne (2005) emphasised, with snowball sampling, the recruited participants use personal networks to ask friends and acquaintances to join the study. Browne (2005) and Naderifar et al. (2017) also posit that snowball sampling is used when the targeted sample is not fully accessed, or when studies have low numbers of potential participants. Likewise, only ten out of fifteen ideal participants were purposively identified by the researcher in this study. Snowball sampling ensured that the recruited participants recommended the remaining five.

Snowball sampling thus became a convenient way of obtaining sufficient participants (Naderifar et al., 2017). The first group of master's students obtained through purposive sampling was insufficient to address the study objectives. I had initially anticipated selecting fifteen participants to generate thick descriptive data. As I could not access all fifteen participants at once, I relied on snowball sampling to supply the remaining five participants. The recruited participants nominated five other master's candidates whom they thought would be willing to be part of the study. I had to ask the original recruits to recommend any other master's students known to them to reach the fifteen participants needed for the study. Snowballing thus helped me to obtain five other participants to join the study. The five recommended participants agreed to be part of the study: all signed consent forms. I emailed them the reflective journal (see Appendix A) after signing the consent form. Thereafter,

participants could begin to reflect on their experiences of using digital technologies in research. Only **four** responded back. Efforts were made to contact the last participant through emails, WhatsApp and calls; however, she did not reply to any of them. The study proceeded with **fourteen** participants. This was a sufficient number to aid in generating thick detailed data to address the key research questions. In this way, the study managed successfully to recruit a total of **fourteen** master's students.

Heckathorn (1997) announces that, over the years, snowball sampling has largely been employed in qualitative studies. Dragan and Isaic-Maniu (2013) also note that snowball sampling is a good research method for studies that describe cases which cannot be generalised. This is in line with the qualitative approach, which provides in-depth understanding on a particular phenomenon (Moriarty, 2011). Dusek, Yurova, and Ruppel (2015) investigated the use of social media to distribute survey research. The study employed snowball sampling to recruit a total of 263 participants from the United States and Russia through LinkedIn software. The participants used social networks such as LinkedIn to nominate others to participate in the survey until the target population was reached. This study serves as evidence that snowball sampling is also employable in quantitative studies, provided it is relevant to the recruitment of participants in order to meet research needs. In this study, snowball sampling was used with the pragmatic paradigm which accommodated qualitative and quantitative approaches. Nevertheless, it is essential to note that snowball sampling comes with many strengths that further appropriated it for this study.

5.7.5 Strengths of snowball sampling

Browne (2005) states that if snowball sampling is used with focus groups, participants usually feel more comfortable with the researcher and with one another during the discussions. The comfort can be stimulated by being grouped with people who recommended them to the study (Browne, 2005). When participants are comfortable around one another, they can speak freely about their experiences without fear of retribution. This study made use of focus group discussions as one of the data generation methods. While I was aware of Browne's sentiments apropos of focus grouping based on familiarity, I used some humour to make participants comfortable, even though some did not know each other. However, because of the appointment negotiated for the discussion, some individuals who recommended each other ended up in one focus-group discussion.

Atkinson and Flint (2001), posit that snowball sampling uses informal ways to reach the targeted participants. During informal invitations, people can use creative ways to convince others to join a particular study (Balon, 2011). In this way, recruiting participants through informal and social methods could encourage them to participate in the study. This method is a strength of the current study. This supports the socialisation experience of obtaining participants which was useful in recruiting the final four participants. There are, however, limitations to using snowball sampling. Therefore, the limitations of snowballing should be discussed, further elaborating how this limitation was overcome in this study.

5.7.6 Limitation of snowball sampling

The use of snowball sampling may present some limitations that the researcher would have to overcome. The main limitation Browne (2005) highlights is that snowball sampling may have negative experiences. The initial sample participants could discourage potential participants from being involved. To overcome this limitation in this study, I ensured that all participants were aware of their rights to withdraw from the study should they wish to do so. As a result of this awareness one participant chose to withdraw from the study a short while after signing the consent form. The study had to continue with the remaining fourteen participants, which were sufficient to address the study needs.

5.8 Data-generation Methods

According to Naderifar et al. (2017) there are a number of ways that data can be generated in a study; this includes interviews, narratives, focus group discussions, reports and observations. It is entirely up to the researcher which methods to use for data generation in order to address research objectives. This qualitative case study used reflective journals, semi-structured interviews, focus group discussions, and digital observations to produce in-depth data about master's students' experiences of using digital technologies in research. The data generation process in this study took place from February 2020 until June 2020 at which time the world was faced with the Corona-virus (COVID 19) pandemic.

The World Health Organisation (WHO) reported that the COVID-19 was initially observed in Wuhan city, China during December 2019. In the early months of the year 2020 the virus spread

quickly around the world, notably in both developed and developing countries such as Spain, Italy and South Africa. On the 11 March 2020, the WHO officially announced the outbreak of the COVID-19 pandemic. In April 2020 there were already 1.5 million reported cases globally. As a result of this unknown virus the world has been faced with major public health issues that required clear changes in human behaviour, the virus being easily spread through physical contact. Thus, physical distancing became a centralised practice globally in order to help combat the spread of a virus that had occurred abruptly. The requirements to distance caused an expanded use of 4IR digital technology resources in higher education practices such as research, to continue with activities regardless of physical distancing and national lockdowns.

As a result of the lockdown, universities were forced to shut down. As with all other citizens, students had to find innovative ways of dealing with their research projects. In these circumstances, what came as a solution was the embracing of the Fourth Industrial Revolution (4IR) resources such as Zoom, Skype, LMS, and the Internet of Things. When the 4IR resources are introduced into research, they are introduced as were those of the previous revolutions to address professionalisation and socialisation experiences at the expense of personalisation experiences.

The coronavirus of 2019 (COVID-19) demanded that I rely on digital technologies as means of replacing physical contact sessions. I had still to continue generating data through semi-structured interviews and focus group discussions. Below is a discussion of how each data generation method was employed in this study.

5.8.1 Reflective journal

Reflection is an essential process that aids in the understanding of experiences. It also enables one to discover meaning based on the reflected findings. According to Hsieh, Jang, Hwang, and Chen (2011), reflection is a process by which people reveal their experiences in order to analyse, describe, and evaluate their practices. In research, a reflective journal is used by participants to reflect and document their experiences which are further employed for analysis. Hiemstra (2001), outlines that reflective writing is a research tool that has gained strength over the past three decades in the field of education. Particularly in qualitative research, reflective journals have been used as a reflexive approach to unravel participants' experiences (Ortlipp, 2008). Reflective journals are notably recognised for enabling thorough reflection of

experiences (Bain, Ballantyne, Packer, & Mills, 1999). Janesick (1998), further emphasises that reflective journals have a reliable and long history within the study of humanities. Qualitative researchers gain finely detailed findings from using reflective journals as a method of collecting data.

Bashan and Holsblat (2017), offer that reflective journals are a source of narrative research written by participants as part of documenting lived experiences. Dunlap (2006) and Bashan and Holsblat (2017) add that reflective journals provide an opportunity for participants to express their thoughts and feelings about their experiences regarding a particular phenomenon. Chikoko (2015) conducted a study to explore six pre-service teachers' professional identities of teaching in the Early Childhood Development (ECD) phase. Chikoko (2015) used reflective journals as one of her data generation methods allowing her to generate rich findings on participants' identities. In Chikoko's study, the reflective document provided to pre-service teachers contained several questions that served as guidelines for them to reflect on, which helped in attaining study objectives. These reflective journals were given to the participants for a period of two weeks towards the end of the data collection process to capture and conclude all their experiences on the kind of teacher they wanted to be.

Exploring research methodology skills of twenty master's students at a particular university in Malaysia, Fung and Hoon (2013) used reflective journals to generate data about participants' research experiences. The researchers of this qualitative study collected weekly journal entries from participants until thirteen entries were reached, to answer the research questions. Furthermore, the topics for participants to reflect on were provided each week based on the knowledge and skills learnt regarding the conduction of research. The use of reflective journals by Chikoko (2015) and Fung et al. (2013) validate that this method is employable in qualitative research studies to produce rich and in-depth data. However, what can also be noted is that researchers use reflective journals in ways that best suit their unique studies.

Therefore, to make reflective journals meaningful and relevant for this study, I used them at the beginning of the data generation period. This opportunity allowed participants to document their experiences of using digital technologies in research and in their everyday lives. The reflective journals contained questions that were designed to guide participants on what they were expected to reflect about, especially to help achieve research goals (see Appendix A). Reflective journals allowed participants to provide their own descriptions of the events that

occurred when they were using digital technologies to conduct their research studies. These findings were used to address the study's first research question, "what are master's students experiences of using digital technologies in research?" aimed at gaining a descriptive response.

The reflective journals were sent via emails to the participants, who were instructed to use a period of three weeks on which to reflect. After two weeks, eight participants had sent back their reflections. I had to remind seven others (via emails) of the submission of their reflective journals. Of the seven participants who had not submitted their reflective journals, six returned these two weeks later. The last participant (one) withdrew from the study. No other reflective journal was received. As a result of this participant's withdrawal, the study was left with fourteen participants. Emailing the reflective journals to participants was the most convenient and suitable way of doing so, as participants were dispersed in different locations.

5.8.1.1 Strengths of reflective journals

Janesick (1998) discusses that using reflective journals aids in producing meaning and understanding shaped by narrative, perspective, culture, and unique participant identities. The reflective journals in this study yielded in-depth and descriptive data that helped me understand master's students' experiences of using digital technologies in research. It is also noted by Hiemstra (2001) that reflective writing allows the researcher to review and acquire progressive clarification of insights by rereading the reflections. Driven by the endeavour to deeply understand master's students' experiences, when each participant submitted a reflective journal, I read it and found details that I used for probing during the semi-structured interviews. This helped in providing more clarity on their experiences. Furthermore, such probing delivered in-depth data for analysis.

5.8.1.2 Limitations of reflective journals

Bearing in mind the limitations of using reflective journals in research, Bain et al. (1999) explain that the contents of each reflective journal may vary greatly thus making it difficult to interpret and analyse data. To overcome this limitation, I allocated more time for data analyses and interpretation. In addition, the reflective journals were designed with questions to guide participants on their reflections. Although they were allowed to write freely and openly about

their experiences, students were also guided to meet study objectives. They were given a duration of three weeks to make use of the journals, reflecting on their experiences of using digital technologies in research. The time frame ensured that participants did not neglect the journals; rather they worked towards a specific deadline.

Chikoko (2015) states that reflective journals may take longer to be returned than the stipulated time. The researcher further states that reflective journals were required to be returned after two weeks in her qualitative study. However, they were only returned on the third week. To address delays in submitting reflective journals, I constantly reminded the participants about the submission date of the reflective journal. For those participants who needed an extension to work on their reflections, I provided them with an extra week whilst I conducted semi-structured interviews with those who had already submitted their journals.

5.8.2 Semi-structured interviews

In this study, data was also generated by using semi-structured interviews in order to continue gathering rich data on participants' experiences. Creswell (2007) contends that through interviews, researchers can generate rich, descriptive and comprehensive data that can be used to stimulate an understanding about the participants' world, and their construction of different ideologies. In addition, interviews can be conducted via one-on-one sessions which would involve the researcher seeking information directly from the participant (Cohen et al., 2011). Harrell and Bradley (2009) contribute that interviews can also be conducted over the phone, depending on the nature of the study, and the level of access to participants. This method, therefore, enables researchers to generate thick data by searching for information about participants' experiences through face-to-face or telephone conversations. Essentially, interviews are methods used to generate verbal data that can be used by researchers to understand participants' experiences and perceptions (Blandford, 2013). Furthermore, interviews allow researchers to 'dig in' to participants' experiences to make meaningful knowledge connections and interpretations based on the interview conversation (Blandford, 2013).

Evans and Lewis (2018) remark that semi-structured interviews are one of the most prominently used methods of generating data within qualitative research conducted in social sciences and education. Such interviews allow the researcher to explore participants' subjective

experiences, perspectives, and viewpoints. These subjective experiences are achieved when researchers include open-ended questions in their interview schedules allowing participants to respond without any restrictions (Cohen et al., 2007). An interview schedule is a document containing a set of clearly defined questions and instructions used by the researcher to seek understanding of participants' realities in order to generate meaningful data (Cohen et al., 2007) (see Appendix B). Whiting (2008) adds that the open-ended questions included in a semi-structured interview schedule allow for participants to respond freely. Mathers, Fox, and Hunn (1998) stress that semi-structured interviews consist of open-ended questions that the researcher asks on the explored phenomenon. Mathers et al. (1998) further argue that these open-ended questions provide participants with the opportunity of answering questions in greater detail to generate thick descriptions of their experiences. These substantiations suggest that semi-structured interviews allow for a detailed discussion between the researcher and their participants in such a way that provides an opportunity for additional issues to emerge. These detailed discussions can be used by the researcher to make meaning out of the participants' realities.

By asking open-ended questions during the semi-structured interview, the participants can disclose their epistemological realities, which a researcher can later use to search for meaning. The epistemological realities of participants may come from their experiences, feelings, and beliefs about a particular phenomenon, which taps deeply into their personal identities (DeJonckheere & Vaughn, 2019). Beyond open-ended questions, a researcher also needs to develop the ability to probe the participants further about their realities. Probing involves seeking further information about the issues projected by the participants during the interview session (DeJonckheere & Vaughn, 2019). Probing is also used when a participant provides unacceptably brief responses to issues. The researcher then has to probe further to encourage a detailed discussion (Mathers et al., 1998). This probing is useful in obtaining more in-depth data that aligns with the research objectives (DeJonckheere & Vaughn, 2019; Evans & Lewis, 2018). Probing that occurs during semi-structured interviewing gives the participants the freedom to elaborate further on their original idea. It also provides the researcher with the opportunity of following up on their enquiry, to meet their research needs (Mathers et al., 1998).

O'Keeffe, Buytaert, Mijic, Brozovic, and Sinha (2016), assume that semi-structured interviews also include close-ended questions which may generate some type of quantitative data. While

this data may not offer accurate and direct measures and calculations, it can provide useful information in answer to a study's key research questions (O'Keeffe et al., 2016). Semi-structured interview can be more or less structured according to the research demands of a particular study (Blandford, 2013). Semi-structured interviews favoured but not limited to qualitative studies. Semi-structured interviews can also be employed in mixed methods studies that consist of both qualitative and quantitative approaches. For example, a mixed method study conducted by Idoniboye-Obu (2013) used semi-structured interviews to support the qualitative approach in order to generate some textual data in her findings.

In order for the researcher to ensure that they capture everything (dialogue) during the interview, they need to audio-record the session. Cohen et al. (2007) emphasise that it is essential for the researcher to audio-record interviews and use the recordings to transcribe data during analysis. Similarly, DeJonckheere et al. (2019) and Mathers (1998) concur that the researcher must record all interview sessions to capture their discussion with the participants on the explored topic. Audio-recording interviews ensures that data is captured effectively. Such makes it easier for the researcher to focus on verbally prompting participants to provide detailed responses (Jamshed, 2014). In addition, audio-recording allows the researcher to focus on the interview contents and listen actively to the participant rather than focusing on writing down notes per longhand, disturbing the focus and affecting active listening (Jamshed, 2014).

When conducting semi-structured interviews, it is also crucial to consider the duration of the interview session. Therefore, Jamshed (2014) submit that each semi-structured interview should last 30 minutes to an hour. In this study, the semi-structured interviews lasted for about 45 minutes on average. Additionally, employing a semi-structured interview allowed me to obtain data in a dialogue form, an essential characteristic of qualitative research. The extensive data generated from the semi-structured interviews also helped in answering the third research question. This question aimed at providing reasons for why master's students experienced digital technologies in particular ways. Additionally, each semi-structured interview session was conducted independently; no participants were interviewed during the same time. The following table shows information giving details of each interview

Table 5.2: Details of Semi-structured Interviews conducted with Participants

Participant	Type of semi-structured interview	Duration	Venue
Dudu	Face-to-face	01:04:01	Research commons meeting lounge
Nkosi	Face-to-face	00:52:09	Residence lounge
Akinola	Face-to-face	00:50:23	Research commons meeting lounge
Shawn	Face-to-face	00:43:35	Research commons meeting lounge
Joseph	Face-to-face	00:53:55	Residence lounge
Gcinile	Face-to-face	01:10:50	Residence lounge
Jessie	Face-to-face	00:42:48	Research commons meeting lounge
Crystal	Telephone	01: 00:28	N/A
Nthabi	Telephone	00:33:43	N/A
Azania	Telephone	00:46:41	N/A
Sinowethu	Telephone	00:52:58	N/A
Thabo	Telephone	01:07:51	N/A
Rose	Telephone	00:54:09	N/A
Musa	Telephone	00:45:04	N/A

The first seven semi-structured interviews were conducted face-to-face with the participants; however, the last seven interviews were conducted telephonically during school holidays and the mid-term university break due to the COVID-19 pandemic. This telephonic interview method was due to the physical distancing and lockdown in South Africa from March 2020. The South African government and the university at which the master's students were studying prohibited any physical interaction between groups (2 or more) of people. I then resorted to

telephone interviews as an alternative, so that I could continue to generate data. I negotiated a date and time which suited the participants - I phoned the students at the stipulated times. All fourteen semi-structured interviews were conducted after participants had submitted their reflective journals. Appointments for both telephone and face-to-face interviews were negotiated via emails and WhatsApp. The participants chose the date, venue (face-to-face only) and time for the interview. Four face-to-face interviews were conducted in a meeting lounge in the research commons. Three participants felt more comfortable for the interview to be held in their residence lounges. The reflective journals were analysed and used as starting point for further inquiry. Each interview was audio-recorded and later transcribed to be used for analysis. NVivo software was used to analyse data and create suitable themes from the transcribed data.

5.8.2.1 Strengths of semi structured interview

Opdenakker (2006), articulates that the strength of the semi-structured interview is that it allows the researcher to depict body language and social cues, such as voice tones. Another strength noted by Opdenakker (2006) is that, with semi-structured interviews the researcher is there to give clarity and probe, offering extra information to help the participant answer the questions. Using an audio-recorder to record an interview has the advantage of being more precise than writing down notes on participants' answers (Opdenakker, 2006). The strengths noted above were evident in this study. I was able to probe participants on what they had written in their reflective journals. Furthermore, in some interview sessions (conducted face-to-face), I observed their facial expressions, such as frowns, laughs, and smiles, supporting their explanations of and emotions about issues discussed. Moreover, in this study, the audio-recorder was placed in an area that did not constantly remind participants that they were being recorded.

Cohen et al. (2007) confirm that semi-structured interviews are good; they allow the researcher to prepare questions ahead of time. The researcher is thus familiar with the questions and becomes competent at asking them during the interview. Creating an interview schedule was a great strength of this study: I formulated questions that were aligned with the research objectives. I also separated the interview schedule questions according to each key research question to ensure alignment. It became easier to ask the questions because I had prepared them myself. I was, therefore, confident when asking the students during the interviews.

5.8.2.2 Limitation of semi-structured interview

However, semi-structured interviews also come with some limitations, as postulated by Van Teijlingen (2014). Semi-structured interviews may invade participants' privacy. The researcher may include their own perception or alter responses. By confirming study findings with other researchers, such as my supervisors, and explicitly describing all methods used, this study adhered to qualitative trustworthiness and authenticity. Furthermore, participants were given the opportunity to review their interview transcripts. In addition, to avoid invasion of privacy, the participant chose where they wanted the interviews to be conducted within the vicinity of Tempo University, which was the central location of the study.

5.8.3 Focus group discussions

According to Wilkinson (1998), the focus group discussion is a method that has increasingly become prominent in qualitative research. This prominence is due to that focus group discussions allow participants to provide detailed answers about their experiences throughout the session (Gibbs, 1997). Hydén and Bülow (2003) add that focus group discussions are interactive. Such interactive discussions promote social communication between the researcher and participants and between participants themselves. In this way, participants' share their views and experiences collectively as a group. It can be argued that this collective discussion further generates a rich understanding of participants' experiences.

Mathers et al. (1998) add that the researchers should identify participants with common factors when forming focus groups, placing these in one group for further detailed discussion. Additionally, Gill et al.'s (2008) explain that focus groups should be conducted in a safe, quiet, comfortable, and private area. In-line with Gill et al. (2008) discussion, Kitzinger (1995), Tong, Sainsbury, and Craig (2007) assert that the researchers should provide a comfortable setting for participants. Such includes having refreshments, and encouraging participants to interact with one another before beginning with focal questions. The researcher's role is to become a facilitator of the discussion, with the main interaction forming between the participants who build on one another's responses (Blandford, 2013). Thus, it can be argued that engaging in focus group discussions promotes a socialisation experience in which participants respond to

each other in a social manner drawing from deep experiences that others' responses may influence.

This study employed focus group discussions as a method of generating data, supplementing individual semi-structured interviews. Focus group discussions were seen as ideal for the study because they provided me with an opportunity of probing the participants further on what was discussed in their semi-structured interviews. Thus, data generated from the focus group discussions were also used to address the third research questions. This question expanded on the reasoning participants provided for experiencing the use of digital technologies in the way that they did. The focus group discussions had their own interview schedule, with a set of open-ended questions covered during each session (see Appendix C). I conducted two focus group discussions in May 2020, when South Africa was already in lockdown due to the COVID-19 pandemic. The two sessions were held on Zoom software which uses video calling to connect people.

Each focus group discussion consisted of five participants, with the researcher (myself) being the sixth person to facilitate the discussion. Powell and Single (1996) contend that a focus group should comprise five to ten participants in order to have constructive engagements from different people bringing their unique experiences into the discussion. Other scholars such as O. Nyumba, Wilson, Derrick, and Mukherjee (2018) suggest that a focus group discussion should have three to twenty-one participants. This variation in number of participants indicates that there is no distinct or uniform number used in studies for focus groups. However, the researcher can be guided by the restrictions indicated above. For these reasons, I selected five participants to be in each group discussion of the ten remaining in the study. The study recruited fourteen participants, four withdrew, stating reasons of social anxiety, busy schedules, and unfamiliarity with Zoom, leaving me with only ten participants keen to be part of the focus group discussions. I found five participants per focus group discussion to be manageable to facilitate and sustain an informative conversation.

I provided these participants with data bundles. I pleaded with the participants to find a quiet and comfortable place where they would join me through Zoom video calling. The data bundle ensured that we stayed connected via our Zoom session. Zoom requires one to have either data bundles or Internet access in order to host live videos. Additionally, participants were grouped randomly, based on the kind of responses they provided during semi-structured interviews, and

according to the date and time at which they were available. It took some time to negotiate the suitable date and time to conduct the focus group discussions, each individual being occupied with various duties in their respective homes. After careful negotiation with each participant, a date was established for the sessions to be conducted. The first discussion took place at 13h00 and lasted for fifty minutes; and the second discussion took place at 16h00 and lasted for one hour. Both sessions were recorded through Zoom, and later transcribed for data analysis. Similarly, to semi-structured interviews, the transcribed data from the focus group discussions were analysed per the aid of NVivo software. The following table provides information about the focus group discussions, as employed in this study.

Table 5.3: Details of focus group discussions conducted in this study

Focus group discussions		
Session 1		Session 2
Duration: 00:49:42		Duration: 01:03:47
Participants (below)		Participants (below)
Azania		Crystal
Jessie		Rose
Moosa		Shawn
Sinowethu		Gcinile
Dudu		Joseph

Using Zoom for the first time came with some challenges, such as connectivity issues. Participants were on Zoom in their homes, in different locations. Hence, the network signals differed from area to area. Those in the rural parts of KwaZulu-Natal (KZN) experienced connection issues in which videos froze, exiting the discussion and entering again. I made jokes in between dialogues to put participants at ease; I did not dwell on the connectivity issue. I ensured that I facilitated the discussion in such a way that participants would continue with their conversation even though some were entering and exiting the discussion. We welcomed

such participants back and updated them on what we were discussing. Nonetheless, using focus groups strengthened participants' perspectives on their experiences of using digital technologies in research.

5.8.3.1 Strengths of focus group discussions

Wilkinson (1998) discusses that the collective interaction between participants through focus group discussion enhances the understanding of participants' concepts, experiences and meaning. This is not the only strength of focus groups; Kitziinger (1995) also points out two strengths in using focus groups as a data generating method. One, is the strength of having participants talk more about their experiences, especially those who may have been reluctant to talk during individual interviews. Secondly, focus group discussion also saves time by offering a convenient way of generating data from several people at the same time. Likewise, in this study, focus group discussions enabled me to develop greater insights in participants' experiences of using digital technologies through collective interaction between one another.

5.8.3.2 Limitation of focus group discussions

Gill et al. (2008) state that, as a limitation, participants may feel uneasy with one another in a focus group discussion. The tension may result in them not discussing their feelings and opinions openly. However, Wilkinson (1998) adds that this matter can be addressed by introducing many different forms of communication, for instance jokes in between discussions, teasing, and stimulating debates. To address this limitation, I ensured that the discussions were geared towards a socialisation experience so that participants would talk more comfortably about issues. Even before I could make a joke in between our conversations, some had already comically shared their experiences, causing others to burst into laughter and commenting further. I argue that these actions contributed to participants' putting one another at ease and opening up more about their experiences.

5.8.4 Observation

Observation as a method is widely used in qualitative research and in various fields such as social sciences (Walshe, Ewing, & Griffiths, 2012). Thus, observations are valuable in studying participants' actions and behaviours, which may further enhance the understanding of specific

phenomena (Mertler, 2008). Other scholars such as Kawulich (2005), and Marshall and Rossman (1989), similarly impress that observations allow qualitative researchers to describe events and behaviour that participants engage in to produce meaning. Thus, it is worth noting that observation helps with providing visual and written explanations on a particular phenomenon (Walshe et al., 2012).

In research, both direct and indirect observation may be conducted by researchers in their studies. Direct observations are when the researcher observes events that occur when researchers are present at the scene (Ciesielska, Boström, & Öhlander, 2018). Indirect observations occur remotely. The researcher must then rely on observing events found in videos, on social media and in documents (Ciesielska et al., 2018). Furthermore, Anguera, Portell, Chacón-Moscoso, and Sanduvete-Chaves (2018) postulate that indirect observation based on social media, allows a researcher to observe participants' written texts or posts produced on a variety of platforms such as WhatsApp, or Twitter, or per email. This indirect observational analysis provides rich information that a researcher can use in their study brought about by the introduction of digital technologies (Anguera et al., 2018).

On the one hand, Driscoll (2011) explains that, during an observation, a researcher can become part of the community whilst observing and recording behaviour (participant observer). On the other hand, Baker (2006) asserts that a researcher can choose to maintain the role of being an outsider, making observations even when they are not present at the event (non-participant). This study used the indirect, non-participant observation method to observe participants' social media accounts, thus exploring their behaviours when engaging with various digital technologies. These observations occurred throughout the data generation period (February-June 2020). Participants' digital actions were observed carefully, to decide how their behaviours influenced their experiences of using digital technologies in research.

Therefore, through participant consent, I conducted indirect observation where I observed participants' Facebook, WhatsApp and Twitter accounts, in which their digital practices unfolded in an unrehearsed manner (Kawulich, 2005; Walshe et al., 2012). I visited each participant's page to observe their digital practices. I observed how they used their social media through their posts; and I paid attention to how they engaged with these digital technologies through these posts. This observation gave me an idea of their familiarity with digital technologies, enabling me to note whether they used social media to post anything research

related. In this way, the second research question, seeking to find out how master's students apply their experiences of using digital technologies in research was addressed through this observational method of generating data.

Thus, I added participants as friends on Facebook and followed them on Twitter to observe their interaction with the above-mentioned software applications. I did not engage with them in their post; I silently observed their social media behaviour through the access they granted to me (non-participant observer). Therefore, with the participant's permission, I screenshot (captured) some of their social media posts to obtain data from the observations. I also ensured protecting the participants' identities by hiding their names and using pseudonyms to present their screenshot social media action (ethical considerations). However, very little data was obtained through this kind of observation- what participants posted on their social media did not relate to the information needed for this study. Thus, to supplement this kind of digital observation, I provided screenshots of some software that participants referred to in their experiences so that the readers could visualise these digital technologies, becoming visually aware of them. For example, if a participant spoke about Endnote, I provided a screenshot observation of Endnote to indicate a visual representation of the software. Furthermore, Driscoll (2011) discusses that a researcher who employs observation as a method is encouraged to use a 'double-entry notebook', which separates observation (facts) from researchers' thoughts, feelings, and judgments. I also used the 'double entry notebook' on my observation schedule, to differentiate between the actual observation and my interpretation of the screenshot (for social media observation).

5.8.4.1 Strengths of observation method

Walshe, Ewing, and Griffiths (2012) noted that observations are more advantageous than any other research method because they generate data focuseing on understanding, roles, behaviour and actions of participants. De Munck and Sobo (1998), asserted that observations afford the researcher access to what they term as 'backstage culture,' which can be used to provide detailed descriptions about participants' behaviours. McKernan (2013), and Walshe et al. (2012) similarly declare that observations are an advantageous research method since they reveal unrehearsed actions that may not have been described by other methods of generating data. Likewise, in this study, the observation method helped in gathering information that the

participants had left unsaid during their reflections, interviews, or focus group discussions. This method also helped in terms of readers visualising the different software used by participants to conduct their research studies.

5.8.4.2. Limitation of observation method

Kawulich (2005) discusses that, when observation as a research method is used alone, the researcher may fail to report other cultural aspects of the participants. To address this limitation, this study did not only use observations, but also employed three other research methods (reflective journal, semi-structured interviews and focus group discussions) to generate data. Kawulich (2005) also asserts that as a limitation, the researcher may not be accepted in the community for observation. Such may be stimulated by the community's discomfort in having an outsider there. To avoid this limitation, I explained the confidentiality process to the participants and made them aware that their identities were not going to be revealed in any way. They were also free to withdraw at any time of the study if they wished to do so.

5.9 Data Analysis

This study employed the pragmatic paradigm, dominated by the qualitative approach thus, after the data was generated and transcribed, it was analysed to provide deep meaning attached to participants' experiences. Data analysis has to do with the researcher making sense of data by providing interpretation and meaning (Kawulich, 2004). In other words, the researcher's duty is to reduce large data by summarising, organising and categorising them, in order to make sense to the reader (LeCompte & Schensul, 1999). Therefore, this study used inductive (thematic analysis) and deductive approaches (analytical framework) to analyse the data. Inductive approaches involve observing and searching for patterns within data findings to develop explanations (Zalaghi & Khazaei, 2016). A researcher has thus to identify relationships within findings, developing significant themes (Thomas, 2003; Zalaghi & Khazaei, 2016). As part of an inductive approach, this study employed thematic analysis. According to Turunen, Vaismoradi, and Bondas (2013) thematic analysis is a qualitative and descriptive approach which is used to identify, analyse and report patterns (themes) within the data. Similarly, Braun and Clarke (2006) allude to thematic analysis as a method of identifying, analysing and providing themes within data that organises and sets out rich and in-depth data. Maguire and

Delahunt (2017) highlight that the aim of thematic analysis is to select themes or patterns in the data sufficiently significant to address the research questions.

The ‘theme’ derived has to capture essential aspects about data in relation to the research question. Therefore, selecting themes means identifying key concepts presented within participants’ responses and presenting them to support the main findings of the study. The researcher’s duty is to make a note of the main issues, and present them as data themes (Tierney & Fox, 2010). In essence, thematic analysis aims to present cohesively categorised and meaningful data that would make sense to the reader (Maguire & Delahunt, 2017). Thus, ‘thematising meanings’ allows the researcher to draw interpretations and make decisions that are consistent with data generated from a study (Alhojailan, 2012). Clarke and Braun (2013) argue that thematic analysis should be perceived as a main tool for qualitative research analysis because of its raw interpretation of findings.

Since all studies are unique, and there is no uniform way to present findings thematically, Braun and Clarke (2006) have provided six phases that may aid in making data clearer when using thematic analysis. Tierney and Fox (2010) further stipulate that the researcher must provide codes that form categories presented in the data as part of the thematic analysis phases. The following table displays the phases used in a study when formulating themes that emerge from data findings.

Table 5.4: Braun and Clarke’s Six-phase Guide for using thematic analysis.

<p>Phase 1: Familiarisation with data This phase consists of transcribing and reading data to note initial ideas.</p>	<p>Phase 4: Reviewing themes This phase deals with checking whether the themes work in relation to the coded quotations and the whole data set, generating a thematic map of the analysis.</p>
<p>Phase 2: Generating codes In this phase, interesting features of data are coded in a systematic way thus collating data relevant to each code.</p>	<p>Phase 5: Defining themes In this phase there is an ongoing analysis to refine the details of each theme. The overall story and analysis generate clear definitions and names for each theme</p>

<p>Phase 3: Searching for appropriate themes</p> <p>In this phase codes are generated as potential themes, meaning that all data relevant to each potential theme are coded.</p>	<p>Phase 6: Write-up for analysis</p> <p>This is the last phase in which final analysis is employed. There is a selection of clear, convincing extract examples. Such produces a scholarly report on the final analysis relating to the research question and literature.</p>
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The six phases negotiated by Braun and Clarke (2006) above, provide the researcher with guidance on how to present clear, detailed data. However, as previously stated, thematic analysis does not consist of a uniform procedure that researchers may follow. This lack of uniformity may come as a limitation as far as thematic analysis is concerned. Maguire and Delahunt (2017) argue that the various approaches to thematic analysis may come with confusion over the nature of thematic analysis and how it can be used in studies. Braun and Clarke (2006) also point out that the absence of clear procedures to follow in thematic analysis suggests that ‘anything goes’. It is because of this limitation that Braun and Clarke (2006) suggested the six phases to guide researchers that employ thematic analysis in their studies. In addition, to address this limitation, I used the NVivo software to create suitable themes that emerged from findings and analyse data from participants’ reflective journals, semi-structured interviews, and focus group discussions. NVivo is a data analysis software developed to manage and analyse large qualitative data by coding research transcripts (Zamawe, 2015). Data coding is a process in which researchers note essential information within their data by attaching categories (Hyde, 2000). The coding of data allows the researcher to understand their research findings better, presenting them according to identified themes (Zamawe, 2015). Using NVivo in this study made it easier to manage and code large data generated from three methods. I was able to identify themes that emerged from the findings, appointing relevant meaning.

When the data were coded and themes were identified, I sought deductive approaches to provide further analysis of the data. Braun and Clarke (2006); Maguire and Delahunt (2017) also emphasise that thematic analysis can be used in combination with many other qualitative analysis techniques or theoretical perspectives to analyse findings. Deductive approaches in research refer to the use of specific theories and frameworks to analyse study findings (Hyde,

2000). Researchers can thus use any theory proven suitable to interact with their data findings (Welman, Kruger, & Mitchell, 2005). The selected framework or theory can be employed as a lens through which to understand the generated data (Jabareen, 2009). Thus, to adhere to deductive approaches, the Persona-Tech analytical framework (produced from theoretical perspectives of CHAT and UTAUT) was used to provide further insight in understanding master's students experiences of using digital technologies in research. Furthermore, I used concepts from the analytical framework to interpret and find deeper meaning from participants' experiences.

5.10 Authenticity and Trustworthiness

Morrow (2005) explains that qualitative research aims to produce quality findings that are enhanced by authenticity and trustworthiness. Shenton (2004) argues that the concepts of authenticity and trustworthiness address similar issues of validity and reliability in quantitative research. In order to attend to these issues, Guba (1981) suggested four ways to evaluate trustworthiness of findings in qualitative studies including dependability, confirmability, transferability and credibility. Similarly, Lincoln and Guba (1982) indicate that dependability, transferability, confirmability and credibility ensure trustworthy and authentic qualitative findings. Since this was predominantly a qualitative study, I maintained authenticity, and trustworthiness of findings, in the following ways (below), using the concepts of credibility, dependability, transferability, and confirmability.

5.10.1 Credibility

Holloway and Wheeler (2002) define credibility as the truth embedded in the research findings. Similarly, Guba (1981) asserted that credibility indicates whether the research findings are true, interpreted correctly, or reflect participants' original views. Qualitative researchers view credibility as congruency of findings in relation to participants' reality (Merriam, 1998). In other studies credibility has been equated with internal validity of findings, in which the study measures what it intended to measure (Merriam, 1998; Shenton, 2004). In other words, researchers need to make sure that their study findings align with participants' epistemologies. This study maintained credibility by transcribing data generated from semi-structured interviews and focus groups in order to provide detailed textual findings. The semi-structured interview and focus group discussion transcripts were sent back to the participants to verify

whether what was transcribed reflected their realities. Moreover, participants were given a chance to listen to their interview and focus group discussion recordings when requested to do so. The confirmation of the recordings helped in ensuring that data used in the study reflected participants' true reality as attested to during the interviews and focus group discussions.

5.10.2 Dependability

Dependability parallels with reliability in quantitative studies. According to Shenton (2004), dependability refers to the processes of providing a detailed report within the study, thereby enabling future researchers to repeat research using similar methods. Providing detailed descriptions of data generation methods enables the readers to develop an in-depth understanding of these methods and their effectiveness in research (Shenton, 2004). Moreover, dependability may be achieved by using 'overlapping methods' such as individual interviews and focus group discussions (Lincoln & Guba, 1985). Therefore, to adhere to dependability as a means of ensuring the study's trustworthiness, I used four overlapping qualitative methods to generate rich data from participants' experiences. These four methods include reflective journals, semi-structured interviews, focus group discussions and observations. Furthermore, I theorised on each of these methods, showed how they were used in other studies, and provided clear descriptions on how they were employed in the present study. In other words, detailed processes (objectives, data generation methods, data analysis methods) of this study were outlined, and relevant appendices attached for the reader to trace.

5.10.3 Transferability

Anney (2014) argues that transferability of findings refers to the degree to which findings can be transferred to people in other contexts. Lincoln and Guba (1985) suggest that the role of the researcher is to provide enough contextual data to allow the reader to make the transfer of findings to their own context. Moreover, Shenton (2004, p. 70) recommends that the researcher needs to provide a thorough description of the phenomenon to allow the reader to understand findings, thereby comparing them to their own situations. To address the issue of transferability, this study engaged critically with literature and concepts discussed centred around the phenomenon. This critical engagement was achieved by discussing theoretical concepts for the reader to be able to understand (e.g. professionalisation, socialisation and personalisation experience). I developed deep meaning of participants' experiences through these theoretical concepts to foster understanding for data presentation and analysis. By

presenting descriptive data, it may be easier for the reader to relate to or transfer the study findings to similar situations.

Golafshani (2003) and Merriam (1998) postulate that, in quantitative studies, findings are applied to other situations through external validity. This transferability occurs when findings of a study are generalised to other contexts. However, Shenton (2004) argues that it is difficult to generalise contextualised studies conducted with small numbers of participants. Thus, transferability in qualitative research allows readers to compare study findings with situations similar in nature (Golafshani, 2003). As this was an exploratory case study, the detailed findings provided from master's students' experiences can be transferred, if the context is similar to that of the study.

5.10.4 Confirmability

Tobin and Begley (2004) explain that confirmability has to do with establishing that findings are not of the researcher's imagination. Therefore, Anney (2014) postulates that confirmability can be achieved by confirming the findings of a study with other researchers. Shenton (2004) stipulates that findings should be based on experiences of participants, not preferences of the researcher; hence the decision for choosing particular methods should be explained. In addition, weaknesses and strengths in the methods chosen should also be revealed. In this study, four data generation methods were employed which includes reflective journals, semi-structured interviews, focus group discussions and observation. The methods chosen for this study were explained, and a thorough critique of the methods was provided to aid in confirmability of the study. The study was also reviewed by two supervisors, who guided the researcher throughout the thesis writing process. The supervisors provided constructive feedback to ensure that the findings were not biased or made up by the researcher. When the study was finalised, an editor ensured that study findings were feasible and free of grammatical errors. This aided in the better understanding of findings.

5.11 Ethical considerations

5.11.1 Ethical clearance

Jamrozik (2004), explains that it is important to seek ethical clearance from relevant committees when conducting research that involves human beings. Sales and Folkman (2000),

stipulate that ethics in research involves preparing researchers to manage research processes with privacy, informed consent, and absolute confidentiality. Ethical consideration recognises and addresses ethical issues that revolve around morality arising from conducting research studies (Gregory, 2003). Therefore, in this study, a letter was sent to the Registrar of Tempo University seeking ethical approval. Full ethical approval was granted by the university on 05 February 2020 (see Appendix F). Thus, I began with generating data through reflective journals, semi-structured interviews, focus group discussions and observation.

5.11.2 Informed participant consent

Nijhawan et al. (2013) explain that informed participant consent is a legal and ethical need for research studies involving human participants. Shahnazarian, Hagemann, Aburto, and Rose (2013) add that participant consent is an agreement to be part of a research project. Each participant must sign a consent letter, understanding what the research is about. Thus, participants involved in research should be informed of the benefits, duration of the study, risks, and their individual rights (Nijhawan et al., 2013). In this study, participants were informed of the nature of the study and of their volunteer participation (see Appendix E). Informed consent letters were sent out to the identified potential participants via emails, so that they could familiarise themselves with the objectives of the study, and their rights as participants. These rights included their freedom to withdraw at any time of the study if they wish to do so. After making a decision to be part of the study, each participant sent back their signed consent letter, once fully informed of the study. When participants returned their signed consent letter, I provided them with a reflective journal so that they could begin to reflect on their experiences. As a result of being aware of their withdrawal rights, one participant withdrew from the study before even engaging with the reflective journal.

5.11.3 Anonymity and confidentiality

Crow and Wiles (2008), indicate that researchers must keep participants and location of study anonymous by using pseudonyms. Keeping participants' identity anonymous is important so that data presented about them may not be traceable (Saunders, Kitzinger, & Kitzinger, 2015). In this study, the participants and the university were given 'false names' or pseudonyms to ensure that there is no public exposure of the university and participants' identities. This anonymity helped in adhering to ethical considerations about maintaining confidentiality of parties involved in research. Anonymity means participants must not be identifiable to anybody

reading the final dissertation; therefore, pseudonyms must be provided, and the name of the university not compromised (Gregory, 2003).

5.11.4 Researcher's orientation in the study

As a researcher, I am guided by research ethics stipulated in studies and relevant university committees. Conducting this study, I upheld and adhered to these ethics, as mentioned above. In addition, I maintained a role in which did not interfere with the research findings in any biased manner, with all interpretations based on findings of the study, as stipulated. Moreover, I treated participants of the study equally and fairly at all times, so that they believed themselves valuable members of the study. I presented myself as a fellow research student, and not as one of the university's tutors, to prevent participants from reluctance to share their honest experiences. I also treated participants with respect and dignity. This ensured that participants felt comfortable sharing their experiences with me, therefore not feeling intimidated. During the semi-structured interviews and focus group discussions, I created a safe space (virtual or physical) in which they could trust me. Participants could then open up and freely share their experiences. I had emphasised that their identities would not be revealed, and their recounting of experiences would only be used for research purposes.

5.12 Limitations of the Study

According to Simon and Goes (2013) limitations of a study involve potential weaknesses that are out of the researcher's control. In addition, Labaree (2013) highlights that limitations of a study include constraints to generalisability, utilisation of findings, and applications to practice owing to chosen design and methods. This study was based on a small number of participants from one university in KwaZulu-Natal; thus, findings of the study were not generalisable to larger contexts. However, in addressing this limitation, in the study I used criteria of increasing trustworthiness of findings such as transferability, I articulated that findings of this study could be transferable to situations of similar context. In addition, some of the participants selected for this study knew me (the researcher) on a personal level as we were postgraduate students at the same university. This acknowledgment could have caused the participants to provide responses that were "favourable" to the researcher. To address this issue of producing favourable findings, I used four data generation methods to triangulate or validate findings. For example, I followed up on issues participants raised in their reflective journals or during semi-

structured interviews. This follow-up method helped in evaluating and ensuring that the information they provided did not contradict the responses given in the methods that followed (interview and focus group discussion).

5.13 Conclusion

This chapter presented the methodologies used in this study. The chapter began by outlining the objectives and key research question which were essential to be addressed in this study. Detailed descriptions of the research paradigm, style, approach, and sampling were indicated. Four data generation methods were also discussed, including the reflective journal, semi-structured interviews, focus group discussions and observations. Data generated through these methods were analysed inductively (thematic analysis) per NVivo software, and deductively through the Persona-Tech analytical framework. This form of data analysis ensured an integrated interpreting of findings of the study, using theoretical constructs together with themes that emerged from the findings. Issues of trustworthiness were discussed, focusing on the four concepts of credibility, dependability, transferability, and confirmability. Ethical considerations, as followed in this study, were identified and explained. The chapter concluded by explaining and addressing the limitations of the study. The following chapter presents the findings generated from the methodologies explained above.

CHAPTER SIX

DATA PRESENTATION AND DISCUSSION PART ONE

6.1 Introduction

The previous chapter provided a detailed discussion of the research design and methodologies employed in this study. This chapter presents data analysis of master's students' experiences of using digital technologies in research. This chapter presents the analysis at a descriptive level using data from reflective journals, semi-structured interviews, focus group discussions and indirect digital observations. This means that the data findings are interpreted and analysed using literature negotiated in Chapters Two and Three of the study and the researcher's understanding of the data to foster meaningful discussion. The data from the semi-structured interviews and focus group were transcribed, the transcripts were read and re-read to familiarise myself with the data and to create suitable themes. As a result of this familiarisation with data, five broad themes and thirteen sub-themes emerged with the aid of NVivo. The NVivo software helped with creating relevant patterns which were identified from the data, giving rise to specific themes and sub-themes that are presented in this chapter (and in Chapter Seven). However, this chapter forms part one of the descriptive data analysis which discusses two broad themes and seven sub-themes in detail (see Table 6.1). Direct quotes from participants (verbatim) were presented using their pseudonyms and alphanumeric codes at the end to indicate where in the transcript the quote is found. The alphanumeric code consists of the research method's first letter, the first letter(s) of the participant's pseudonym, and the page number where the verbatim is found. For example, if the data excerpt was extracted from the focus group discussion, giving Dudu's words on page four of the transcript, the excerpt will reflect as [FD4] (see Table 6.2). However, Table 6.2 only gives the alphabetical codes, excluding page numbers. The interpretations of the study findings were based on the researcher's understanding; however, it was not limited to such, as there are many perspectives to understanding phenomena. The following table points out the broad themes and sub-themes as used in this chapter.

Table 6.1: Organisation and Presentation of broad themes and Sub-themes that emerged from master’s students’ experiences of using digital technologies in research

Broad themes	Sub-themes
THEME 1: Students’ positive experiences of using digital technologies	1.1 The usefulness of prior experience on digital technologies
	1.2 Digitalised research experience, especially during COVID-19 lockdown (convenience, access, and continuity)
	1.3 Learning from other digital technologies (application software and search engines)
THEME 2: Students’ negative experiences of using digital technologies	2.1 First-time experience using digital technology
	2.2 Haphazard introduction of emerging digital technologies, especially during the COVID-19 period
	2.3 University-recommended digital technology
	2.4 Experiences in storing research information in software and hardware digital technologies

Table 6.2: Codes used to identify participants' verbatim remarks in transcripts. N/A indicates that the participant did not participate in the focus group discussion; thus, the code is not applicable.

Participant name	Code used for the reflective journal	Code used for the interview transcript	Code used for the focus group discussion transcript
1. Dudu	RD	ID	FD
2. Jessie	RJe	IJe	FJe
3. Akinola	RA	IA	N/A
4. Nthabi	RNt	INt	N/A
5. Sinowethu	RS	IS	N/A
6. Rose	RR	IR	FR
7. Joseph	RJ	IJ	FJ
8. Crystal	RC	IC	FC
9. Thabo	RT	IT	N/A
10. Gcinile	RG	IG	FG
11. Shawn	RS	ISh	FSh
12. Nkosi	RN	IN	N/A
13. Moosa	RM	IM	FM
14. Azania	Raz	IAz	FAz

6.2 Theme 1: Students' positive experiences of using digital technologies in research

This broad theme emerged from the data findings. The theme presents discussions about what was perceived as positive experiences from master's students' use of digital technologies in research. In this theme, the participants describe their research activities involving digital technologies that contributed to positive experiences. The broad theme is sub-divided into three sub-themes,- namely: the usefulness of prior experience with digital technologies; digitalised research experience, especially during the COVID-19 lockdown (convenience, access, and continuity); learning from other digital technologies (see Table 6.1). The following sections discuss the three Sub-themes in greater detail.

6.2.1 Sub-theme 1.1: The usefulness of prior experience on digital technologies

A number of participants confirmed that their prior experience with digital technology had prepared them for their use of digital technologies during their master's study. Even though this preparedness occurred in different ways, to a greater extent, it aided their positive experience of using digital technologies in research. In response to prior experience of using digital technology, Moosa revealed:

As an undergraduate student one of my major modules were Information Systems and Information Technology so that's where I gained a lot on how to use any digital technology (RM2). Further expanding on how specialising in Information System in his undergraduate studies has influenced his master's study, Moosa added: I told you about this thing of referencing using Microsoft Word, yea, so I am not using Endnote, I only use Microsoft for referencing-APA 6th style. That is one of the things I learnt through the study of Information Systems, so I am now using that a lot for my research (IM4). Microsoft Word is more like the backbone of my study; I use it to write anything that has to do with my research. With regards to its features, I would say I understand most of its features now because kade ngaqala ukuwusebenzisa (I started using it a long time ago), from my first year in 2012 and the following year I studied the entire Microsoft package (IM3). Moosa's choice to not employ Endnote in his master's study was influenced by his prior use of Microsoft Word referencing, which he was used to in his previous studies. Seemingly, Moosa understood Microsoft Word referencing well, which became useful for his master's study. As much as he was aware of Endnote

referencing, he chose to adhere to what he was familiar with and what worked for his personal study. Amory (2014) and Khoza (2017a) argue that the professionalisation experience refers to the use of digital technologies strongly driven by formal learning. In this case, having studied and used Microsoft Word for some time contributed to Moosa's expertise in referencing using this particular software (a professionalisation experience). In other words, Moosa had already personalised this particular professionalisation experience of manual referencing in such a way that it could no longer be changed by the introduction of Endnote by his university.

Azania also explained how her Honours study exposed her to some of the search engines that were useful in accessing relevant articles for her study. She said: *I knew about Google scholar from my Honours study experience, otherwise I didn't know anything about it before. I didn't know how to search and discover articles; I only knew about it during Honours when one of our lecturers taught us about it (IAzI)*. She further stated that: *I can now use Google scholar in my cell phone to search for articles everywhere and anywhere (RAz10)*.

On a similar note, Crystal found that her use of SPSS software during her Honours study had enabled her to understand how it works. When she officially started to use the software for her master's study, the experience helped her. She became aware of some of the software's features. She shared:

For my Honours, most of the work was input by someone else on the SPSS software and then we were shown how to use it but it was mostly done and sent to us, we were only choosing from the graphs, standard deviation and mean which worked for our own studies. We were also guided [by the lecturer] when working with a particular graph and it was more like given to us having done by someone. So, I would say it helped me because I was aware of it but not fully aware of how to create graphs (IC7).

She further clarified:

Also, for my Honours, we would work together as a group trying to manipulate the data on the SPSS software. So, I think we assisted each other because one would understand how one tool works and another wouldn't so we would sit and try to do it together that is how we would learn. Those are the group members I studied with during my Honours (IC6). A scrutiny of participants' experiences indicates that various stakeholders assist students in understanding

the use of digital technologies. For example, Azania and Crystal expressed how their lecturers introduced them to, or assisted them with using specific digital technologies. When students engage in their research studies, they belong to a community of various stakeholders playing different roles (Nussbaumer, 2012). In this case, the lecturers played the role of sharing their expertise on specific digital technologies with their students which became useful to some (Azania and Crystal), even for their master's studies. Crystal particularly alluded to collaborating with other students, in understanding the operations of the SPSS software. This implies that they were able to form a community of practice focusing on sharpening their SPSS technological skills (Bostancioglu, 2018; Chigona, 2013).

Moreover, Gcinile talked about her undergraduate experience from the perspective of enrolling in a computer literacy module that prepared her for the use of digital technologies at university. Gcinile said:

During my first year at University, I did a module called Computer Literacy. Computer Literacy introduced me to the basics of using a computer, for example, making slides and typing using Microsoft Word. When I bought my laptop, I had an idea about how computers are used (RG2).

When asked whether she uses what she was taught in her previous undergraduate study in her master's study, she replied:

Yes, for instance with slides and PowerPoint, I am about to go defend my study now and I had to prepare slides using the information that was provided by the computer literacy experience to prepare PowerPoint presentation for my proposal defence. With Microsoft Word, I am able to type my master's thesis and make sure that I save my work before it gets lost (IG3).

Gcinile's response shows confidence in using skills and knowledge obtained from her previous engagement with PowerPoint and Microsoft Word during her undergraduate study. Her articulation further reveals that she was able to use the strength of her professionalisation experience to influence her current master's study (knowing how to create slides). In other words, Gcinile's self-actualisation in using PowerPoint and Microsoft software was influenced by her professional/academic use of digital technologies in her previous studies. Joseph also emphasised the significance of the computer literacy module by indicating that it helps students

familiarise themselves with the use of a computer. Furthermore, it removes the fear of working with any digital resource. He shared:

I experienced computer literacy during my first year doing B.Ed. study, that module is very important because not everyone is accustomed to using a computer. Some students you find that it's only their first time to see and use a computer so studying computer literacy helps a lot with typing and working around a computer. Most of the time one is afraid to explore things such as a computer maybe because it will break. That module makes you get used to using a computer and it makes you think more about how it functions (IJ7).

Discussing the issue of alleviating fear of using digital technologies, Nkosi responded:

Let me say this. By having a teacher in primary school who taught me not to fear a computer, it allowed me to explore it as much as possible. When someone teaches you something, for you to learn, enjoy, understand and say this is a tool I can use, you need not to fear it. Once that person teaches you that you can do anything with that tool, you become creative with it but once someone teaches you from the word go that you need to fear a computer. When you are alone and as you grow up you have a sense of fear about such technologies or whatever tool. You might end up having anxiety, a panic attack or put your master's studies on hold and people won't understand why. kanti nje (it is just) i-computer (INI3).

Both Joseph and Nkosi's responses reflect the merit of being taught not to fear a computer, albeit from different perspectives. Nkosi had the advantage of his previous schooling experience that taught him the value of not shying away from digital technologies such as computers. Additionally, Nkosi raises possible consequences of dreading digital technologies at master's research level, which is that this response may lead to anxiety or panic attacks. A similar instance was observed in a narrative study conducted to explore information systems students' experiences of computer programming. The findings indicated that students expressed anxiety, stress, and panic as a result of hostility towards the programming course that some were doing for the first time, with others doing it at a higher level (Rogerson & Scott, 2010).

It seems that students' previous experience with digital technologies sometimes occurs before enrolling in university studies (as reflected with Nkosi). In this regard also, Rose and Crystal

further spoke about their experiences prior to (and during) university studies that affected their use of digital technologies. Rose talked about using digital technologies from a young age, when she was taught by her family how to use a computer that she still has, and uses in her masters study to write her dissertation. She asserted: *When it comes to using a desktop or laptop, I started using them at home, at a young age, which was not that hard as my older siblings helped me understand them. Thereafter, when I was a first-year student at university, I took a computer literacy module which introduced me to more than just typing and browsing. For example, it taught me how to use PowerPoint, sending and receiving emails, downloading and saving documents and more. (RR2).*

When she was probed on applying her previous experience to her use of digital technologies during her master's study, Rose added: *For instance, when I type, I know where my Word document is. You know when you open your laptop and you have to search for what document, I know where to find it which is in the folder on my laptop. It doesn't take me long to get to it and it is much easier for me because I already had an idea (IR3).*

Crystal presented a similar case when revealing the following:

For me I think, growing up and being exposed to different types of cell phones such as Nokia 3310 to other different phones, I would learn new words, receiving and ending calls. For me, that is where it all started, I learnt about those phones and then moved to computers and then during university we attended that computer literacy module which assisted me a lot in knowing how to use Microsoft Word and Excel. All of these experiences slowly prepared me for what lay ahead (FC1).

Crystal further added:

The phone helps you type a lot so the keypad prepares you for typing your thesis even though it may be different in a laptop, but a phone keeps you prepared for typing and it helped me get in touch with the keys of the keyboard and seeing how a keyboard looks like so when we upgraded to a laptop, I was still familiar with those keys (FC2).

The above accounts from Rose and Crystal suggest that using digital technologies from a young age boosts one's familiarity with such resources. In addition, it seems as though the three participants who enrolled in computer literacy (Gcinile, Rose, Crystal) appreciate this subject

for formally introducing them to most digital technologies that are also used for master's research (such as Microsoft Word and PowerPoint, to name two).

Extending the discussion on the usefulness of previous experience with digital technology, Akinola brought in an experience on the use of Turnitin: *With Turnitin, fortunately for me and my friend, we were coming from undergraduate study where we used these digital technologies, and I could still remember how to use these digital technologies now during my master's. Most of the older students are helped by us especially with the issue of Turnitin (IA2)*. Akinola's claim suggests that she saw as an advantage, her earlier experience with Turnitin prior to her masters' study. This advantage is shown in her choice of words such as "*fortunately for me....*" Thus, in her speech it appears that Akinola was aware of the positive contribution of her previous experience with Turnitin, even in comparing her experience with other students who may have not used the software before. Also, being able to "*still remember how to use specific digital technologies*" emphasised the usefulness of previous exposure to technologies.

Referring to her experience with PowerPoint software, she asserted: *I can say PowerPoint is a tool that is very interesting and fantastic for me because it is not something that is new to me in my postgraduate study since we had been introduced to it by our activities of using PowerPoint in groups or individual work during undergraduate study. Even in my Honours study it was the same story. I am familiar with it (IA5)*. Akinola's comment validates her previous assertion that having prior introduction to digital technologies adds to positive experience. Also, it is not only positive experience but feelings too.

6.2.2 Sub-theme 1.2: Digitalised research experience, especially during the COVID-19 lockdown (convenience, access, and continuity)

Concerning Sub-theme Two, participants revealed their experiences with digital technologies, indicating that it had allowed them to access useful information at their convenience, especially during the COVID-19 pandemic. Even though they were confined to their homes, they discovered that various digital technologies enabled them to continue their research studies with ease. In this regard, Rose expressed a positive experience with using digital technologies at home during the COVID-19 pandemic. Rose affirmed that it eased her process, and she was thus able to continue conducting her research:

Digital technologies have had a positive effect on my research because I am still able to do my work even though we are in lockdown. It makes me feel happy to use digital technologies in these circumstances because it has become easy for me to do my work at home. I have my phone and laptop that I can use to type my work and conduct research (IR11).

When asked how she interacted with the people involved in her study, Rose responded:

We normally use WhatsApp and emails for both the students and supervisor. It makes communication easy and convenient with my supervisor and other students (IR12).

On a similar note, Thabo emphasised the cohesion he achieved by digitally communicating with his research group and supervisor during the COVID-19 pandemic. Thabo:

Digital technologies have helped a lot. For me it is the same experience as when I am on campus; it is just that I am working in the convenience of my home. I am still able to communicate with my group and my supervisor on WhatsApp. We usually share useful information there and I connect with my friends asking questions from there. I take pictures on my laptop and send them to my friends asking them to proofread my work (IT11).

Thabo also confirmed how convenient it is to operate from home:

Digital technologies have been good because I don't need to go to campus to access digital technologies, but I have them with me at home. I open my laptop and hotspot using my phone and I am able to work (IT11).

According to the comments above, both Rose and Thabo could meet their personal research needs using various digital technologies even during the COVID-19 pandemic. They continued their research on laptops and cell phones, with Thabo concentrating on writing, and Rose, on editing. Thabo and Rose have also used WhatsApp to converse with their fellow students and supervisors respectively. According to Khoza (2011), using emerging technology for personalisation experience allows one to draw on internalised historical and cultural practices stored mentally. Therefore, Rose and Thabo's continued use of WhatsApp for communication reflects that it had become a habit for them to chat about research-related issues with their peers and supervisors via this particular software application. The participants (Thabo and Rose) had

internalised the use of WhatsApp for their own research needs, such as keeping in contact with important stakeholders when they couldn't meet them in person. WhatsApp is an application software that allows users to communicate with one another in a social setting (Mpungose, 2020b). As a result, participants' socialisation experience attributes drive their personal experience of using WhatsApp for contact during lockdown. Figure 6.1 below gives a screenshot of WhatsApp, providing a visual representation of the software.

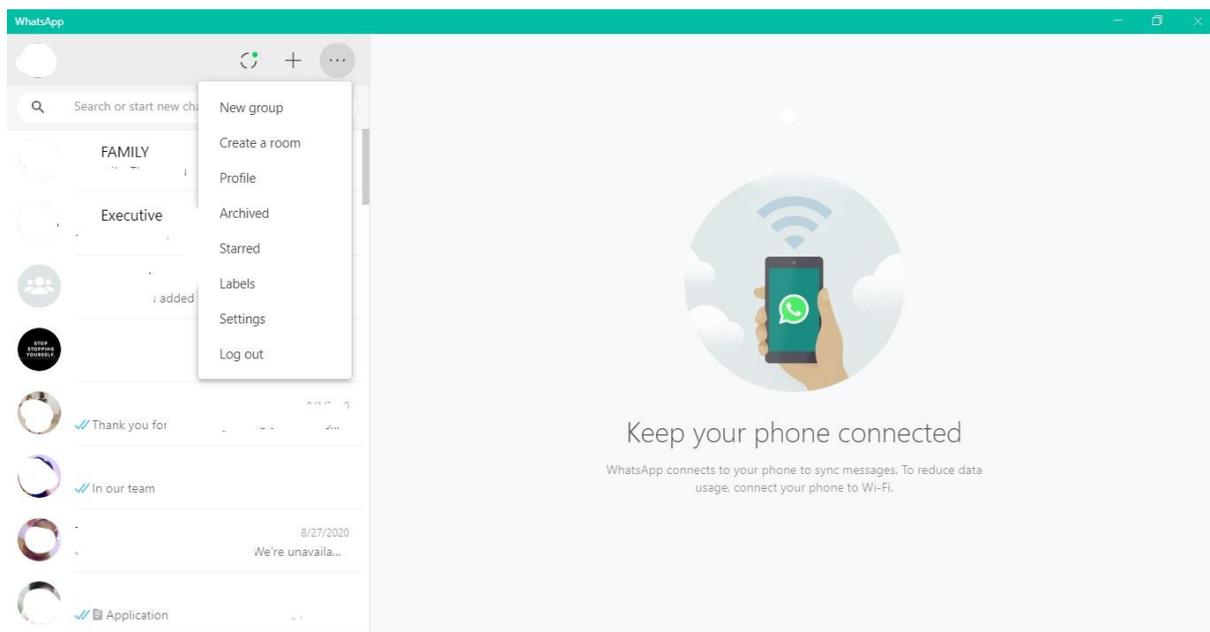


Figure 6.1: WhatsApp software observation (installed in a computer)

Dudu was also pleased that the use of digital technologies enabled her to keep working on her studies during the COVID-19 lockdown. Dudu expressed:

Digital technologies are a life saver. There is a lot of work that would have gone to waste due to the lockdown but with digital technologies we were able to save our work/thesis. Otherwise, this COVID-19 period would have been a waste of time. We are able to do our work remotely and communicate with our supervisors and fellow students. We can basically consult anyone that we wish to consult during this time (ID18).

Dudu explained that she was able to keep up with essential administrative tasks by engaging with her supervisor and research-office stakeholders to monitor the progress of her ethical clearance application:

Because of digital technologies I was able to send an email to the research office with a screenshot of my application [ethical clearance application] on the Research Information Gateway (RIG) online system. I sent the email via my phone and they received the status of my ethical application (ID17).

Applying for ethical clearance in the clearly defined online system-Research Information Gateway (RIG), is a university-mandated and structured procedure for master's students. Therefore, when using digital technology is mandatory, students gain some professionalisation experience by following particular procedures (Khoza, 2017a). As a result of having access to digital technologies, Dudu was able to monitor the progress of her ethical application using her smart phone (hardware) and email (software), even though she couldn't go to the university research office directly owing to COVID-19 movement restrictions.

Crystal stated how digital innovations have aided her in continuing her research project. Crystal said:

Digital technologies are good and are coming in handy. Maybe in the past I have taken them for granted and I hadn't really recognised their significance but using them now for my research during Coronavirus, they have made things much easier. I am able to cope with my work because I do research activities like searching for articles even when I am home. So, I think they are good, and they might grow further because of what is happening in our country and the world at large (IC12).

Crystal's response indicated her 'appreciation' of digital technology. Crystal praised its usefulness during the COVID-19 times. During the lockdown, Crystal was still able to complete some of her study activities. Furthermore, undertaking her research during the COVID-19 national lockdown made her aware of the changing nature of emerging technologies. This experience shows that, as emerging technologies change, users must adapt to new ones in a timely manner (Dlamini, 2015). In her last statement Crystal also indicates her thoughts on the future of these technologies. When Crystal was asked how she felt about working from home, she said that she felt relieved.

Crystal:

It feels good to use digital technology during these times because I feel a sense of connectivity with my supervisor, and I know that I am going somewhere with my research. I wasn't just left in the dark and not hearing from her. So, it makes me feel calm and at ease that technology could do that for us (IC11).

Similarly, Akinola expressed gratitude for having an Internet connection available to her at home because she could continue with her work during lockdown or any other period throughout her master's studying.

Fortunately, where I am there is Wi-Fi so I am able to work when I want to search for articles or anything that can help me for my study because I am able to get access through the Wi-Fi and I can also send emails. I communicate with my supervisors and colleagues through my emails (IA9).

As with Rose and Thabo, Dudu, Crystal, and Akinola stayed in touch with various stakeholders in their research community, most notably their supervisors, who kept them optimistic about their research during the COVID-19 lockdown. A community is made up of people who are responsible for assisting master's students in achieving their research goals (Kuutti, 1996). In the context of this study, the supervisor is the most significant and prominent member of a postgraduate student's research community. Digital innovations have made it easier for students to remain in contact with this important stakeholder. These participants (Rose, Crystal, and Dudu) may have developed "coping with uncertainty" as a new identity (value) that has aided them in addressing their research needs, even during the COVID-19 lockdown (Sokhulu, 2020). Although digital technologies were generally convenient, ensuring access and continuity for the four participants' research studies (Crystal, Dudu, Rose & Akinola), some participants identified difficulties using these resources at home.

Thabo brought up the extra data costs for those without Wi-Fi at home.

Thabo:

The only problem I have is that I don't have access to Wi-Fi. When lockdown started, we had to buy data for ourselves in order to connect to our laptops. As time went by,

we were sponsored with data by the university. When we left campus, it was announced that we were going to get data, but we waited months for it (IT10/12).

Thabo also spoke on some of the practical issues that come with an uneven mobile data network signal:

During the day network connectivity in my area gives me some issues. I have to refresh my laptop or phone, and then I am good to go again (IT11).

In a similar vein, Gcinile asserted:

Not all of us live in good conditions where we have access to Wi-Fi, so that on its own is a challenge because we had to utilise our own data bundles so that we could access information via Google. That is what is problematic about COVID-19 and working from home. Since March I have had to buy my own data, as the university gave us data bundles very late (IG9).

Thabo and Gcinile's experiences show that access to the Internet is needed for digital technology to enable the effective continuation of academic research. Master's students' research activities can be hampered by or even terminated if they do not have access to the Internet. Such deprivation may result from financial restrictions or network connectivity problems. Gcinile and Thabo had to develop the value of "patience" in their personalisation experience personality as a result of having to wait for data package support from the university (Sokhulu, 2020). Their experience also shows a problem-solving identity. The two students had to purchase their own data in order to continue operating, not having obtained their data packages (Sokhulu, 2020). Furthermore, the lack of data accessibility during the COVID-19 lockdown leads to academic isolation, as researchers are unable to communicate with their research community's various stakeholders in searching for and accessing information.

Sinowethu's idea of convenience referred to choosing one application software over the other for communication purposes. Sinowethu: *WhatsApp is more convenient than email. Using WhatsApp is easier than having to login, signing in through Microsoft, signing into your email and reading your emails. It's unlike using a cell phone because it is always in your hand (IS5).*

In the same vein, Shawn stressed the convenience of WhatsApp, highlighting its promptness in response. Shawn:

For instance, with WhatsApp you just send a message to a person asking how do I do this? and the person will respond promptly to direct you rather than calling for a meeting where a person will take maybe a day to get back to you. With digital technologies it may even take five minutes if the person is online. Also, with internet you get the message instantly (ISh7). In essence, WhatsApp seems to have provided easy access to stakeholders involved in both Sinowethu's and Shawn's research studies, making it convenient and a preference for communication.

Jessie noted that digital technologies enabled communication and access to some scholars in her field, thus retrieving relevant articles. *Jessie: I communicate with my supervisor and I also communicate with people from other universities that have written articles that I need, and I cannot access online because the university did not pay for them. So, I can write an email to them requesting those articles from them (IJe7).* In this way Jessie benefited by saving money and obtaining the articles she sought from the identified scholars. Jessie shared a peculiar experience that none of the other participants spoke about. Jessie accessed articles directly through seeking them from their authors. As a result, digital technologies allowed her to reach out to stakeholders who were far away, thus expanding her research community members. With Azania, convenience and access had to do with being able to engage with her research activities wherever she was. Azania explained:

When I am home, I use my laptop and router, when I am at work, I use my phone. I saved my articles on my phone then when I am at work, I just read them. So, as I email myself articles, I also save them on my phone, when I get time at work then read those articles using my phone. I also do have Google chrome in my phone which I use to collect articles when I find time at work. Even in the taxi, I do the same thing, I just open my phone and start reading articles and Google articles (IAz3). In this regard, convenience and access is associated with having relevant digital technologies that allow the student to participate in her study activities in different contexts, as long as she has the time and space to do so.

6.2.3 Sub-theme 1.3: Learning from other digital technologies (application software and search engines)

This sub-theme emerged from participants' experiences of learning from online platforms on how to use specific digital technologies and learn how to write their dissertations. Participants shared that when they could not understand the use of any technology, they searched online to

seek help from others who may experience a similar issue. With the most utilised application software being YouTube, Moosa said:

I also had to go on YouTube and stuff because I find that even at master's level most people (that I know of) still struggle with Excel. I always believe that in YouTube you find what you are looking for. If you have a question about something you always find a response on YouTube or Google. There are a lot of other people that have experienced the problem I experience so they write about it on the forums online. So, you will always find solution to whatever challenge you are facing. Since we are moving towards the Fourth Industrial Revolution, there is no escape from learning how to use these things. (IM8).

Shawn, on YouTube:

I watched the Internet, there are some videos that are there about Endnote. I went on YouTube and typed APA citation. It provided me with a list of videos showing what to do if I want to cite using the APA style. So, they teach you there on YouTube a lot. There are so many things that I learnt on YouTube besides the use of Endnote, for instance the chemistry content. Like the things that I did not know. So, they were easy for me to explain in my study. Since I am researching on the chemistry part of agriculture (ISh4).

Further elaborating on his experience, Shawn explained:

You know YouTube has got a lot, so there you find doctors, professors and supervisors that spend their time teaching people how you are expected to present a proposal for master's and PhD. They give you a lot of information, they are genuine people, and they are professional by giving you clues and steps on how to present your proposal. What is it that you need to focus on, they mention that the methodology is the important part of your research. YouTube was working very best for me (ISh5).

Thabo shared similar sentiments as Moosa and Shawn but referring to learning about theories.

Thabo:

Now I use YouTube to understand the theories I will be using within my chapter two which discusses theoretical frameworks. I am using three theories which I was never taught about them so as a student you just have to find means and I found YouTube useful in that way for me. On the platform you get someone to teach you without you going to your lecturer and supervisor to teach you about these. You learn on your own

with someone on YouTube unpacking on a particular phenomenon. It feels amazing because you don't have to beg people to teach you about stuff. You don't have to contact your supervisor to inform them on your misunderstandings. You become more of a creative learner and learn on your own. You grasp more when you learn on your own (IT4).

Crystal was asked how she used YouTube. She had indicated that it is (in the reflective journal) an application software she utilised in her study. Crystal:

I actually went onto YouTube to check how to create the table of contents and the details of how to go into it just to refresh myself. So, I would say my first time learning it was with my lecturer, she taught us how to do it but then I forgot, and I had to refresh via YouTube. It is useful because it guided me in a step-by-step manner on how to go about creating headings because I was having a problem with the numbering and the typing font. So, it really helped me out with that. (IC2).

Additionally, Crystal stated:

So, I use YouTube to find out information, when I don't understand something. I go there and find out many things about how to use digital technologies such as Grammarly, SPSS and Endnote (IC8).

What one finds from the participants' articulation is that they somewhat relied on YouTube to provide them with solutions or information on issues they were experiencing with specific digital technologies (Moosa, Shawn, and Crystal, in particular). It seems that through learning from this software they were able to attend to their study needs. Additionally, Thabo and Shawn seemed to have gained professional knowledge about their study contents by searching such contents from YouTube, which was useful. As a personalisation experience, both participants were able to identify an application software that attended to their professional needs. Thus, using words such as "*YouTube was working very best for me*" (by Shawn) and "*I am using three theories which I was never taught about them so as a student you just have to find means and I found YouTube useful in that way for me*" (by Thabo) indicate their satisfaction with learning certain contents from YouTube. Furthermore, the experiences imply that the participants had identified the types of digital technologies (a software in this case) that were useful for their studies (a personalisation experience). Their personal research, thus drives students' needs to explore the various digital technologies they use for their studies (Budden, 2017).

On Moosa's assertion, it appears that master's students enrol with diverse needs in terms of the use of digital technologies. Some students "*struggle*" with certain software. Moosa did not rely on his fellow students, but on YouTube and other online search engines to seek help when he also experiences some barriers to digital technology use. Moreover, a few participants in their pronouncements suggested that there are online communities (consisting of various stakeholders) that one can learn from. For example, Shawn recounted that some academics shared useful information on defending one's study online through YouTube. Thabo also indicates his positive feelings about finding relevant information online. His choice of words such as "*you become more creative and learn on your own*" shows a sense of developing autonomy through searching for information himself using available online resources, rather than being too dependent on people around him.

Rose's experience differed from the other participants. Rose:

For my theoretical framework section, we were advised to look at YouTube and to look at researchers such as Butler. My peers advised to do so because they said it was easier for them to learn from YouTube and it gave them a clear understanding about their topics. [Well] for me, I didn't put much interest to it. I couldn't go about using it. That's it for me. It was time consuming. For me I find it better if I read something (IR9).

Rose appears to be a member of a peer social group that guides one another on how to use digital technologies to gather valuable knowledge for their studies. However, what is interesting about Rose's experience is that she was self-aware about what worked for her study. Words such as "*I couldn't go about using it, that's it for me, it was time consuming. For me, I find it better if I read something*" indicates self-awareness, that even though she considered her peers' recommendations, she soon realised that theirs was not an ideal way for her to attend to her learning needs. The following figures (Figures 6.1 and 6.2) present a visualisation of the YouTube online platform that was used by the participants.

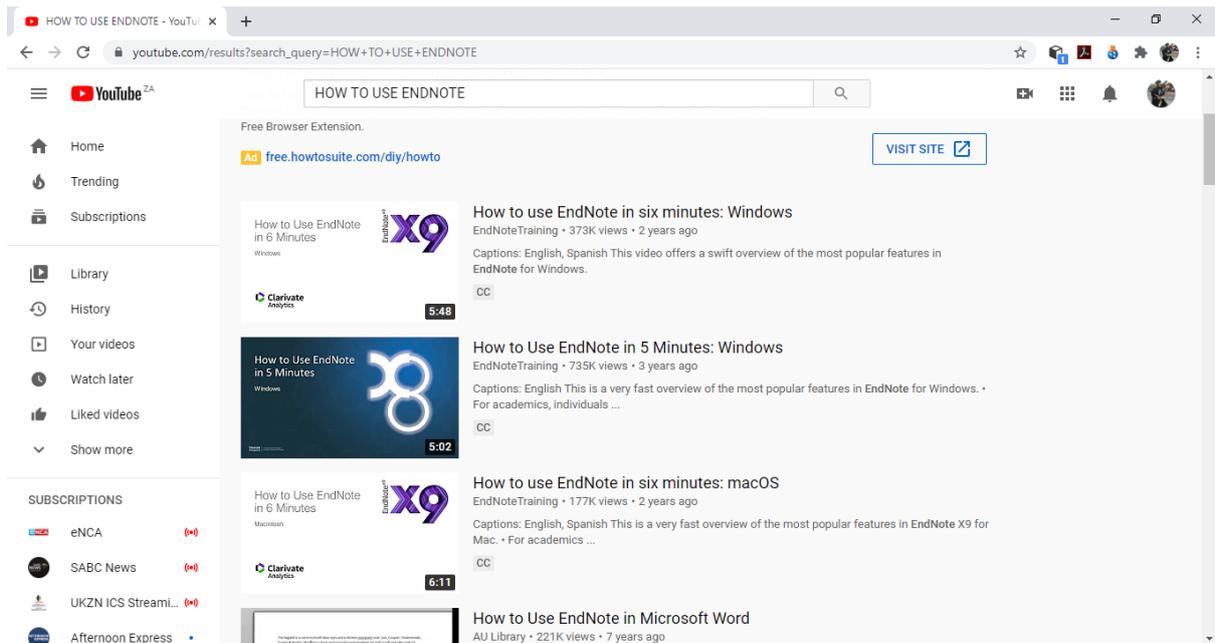


Figure 6. 2: Observation of YouTube

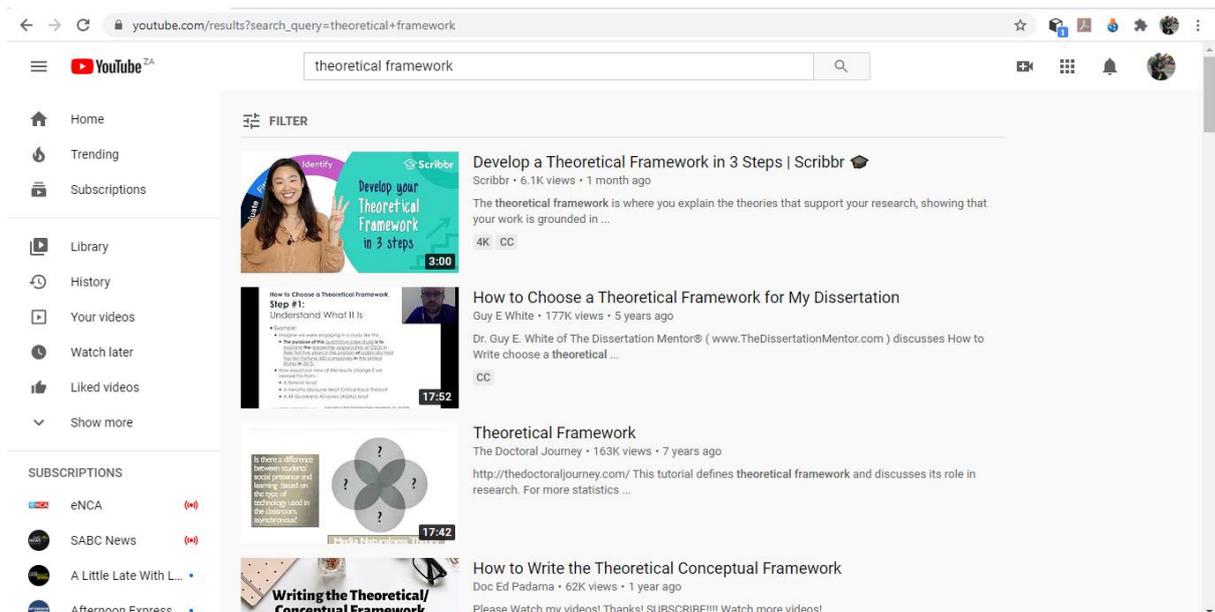


Figure 6.3: YouTube software

6.3 Theme 2: Students’ negative experiences of using digital technologies

This broad theme presents what was understood as participants’ negative experiences of using digital technologies in research. This broad theme is sub-divided into four sub-themes: first-time experience using digital technology, the haphazard introduction of emerging digital technologies, especially during the COVID-19 period, university recommended digital

technology, and experiences of storing research information in software and hardware digital technologies (refer to Table 6.1). The four sub-themes are discussed in detail below.

6.3.1 Sub- theme 2.1: First-time experience using digital technology

When participants were asked about their experiences of using some digital technologies for the first time during their master's, they focused mainly on Endnote, SPSS (software) and a tape recorder (hardware). What was interesting about this sub-theme was that, as some participants referred to their experiences, they also expressed how they felt when they were using these digital technologies for the first time. In most cases, these feelings were in line with participants' negative experiences. Jessie shared the following about her first-time experience with Endnote software:

Firstly, I was scared, and I felt a heavy burden over my shoulders because it was my first-time using Endnote and I didn't even know that there was a click for it on my laptop when I open the Word document. So, when you open the Word document there is a section that is written Endnote and I don't know why I didn't notice it. Maybe I am in denial or I don't pay careful attention to my laptop because I work with what I know but it was very hard for me. I remember when I went to the library assistant and he asked if I know this Endnote. I told him I don't know anything about Endnote, and he asked me if I have been to any Endnote sessions and my answer was no. He gave me a quiz with question about where to find Endnote. I told him I don't know anything about Endnote it is just that my supervisor told me to use Endnote and it happened that people told me that you specialise in it. He showed me Endnote on the Word document and I felt so embarrassed because wow, I have had the laptop for so many years and I haven't seen the Endnote icon on a word document. When he told me about Endnote, I had a lot of emotions such as being scared and feeling like I will not master this thing. So, it was fear of the unknown since it was my first time and I used it when I was about to submit my thesis (IJe2/3).

Akinola also admitted to having negative experience and feelings with using Endnote. Akinola:

Endnote is a new technology for me in postgraduate master's study. So, I felt very frustrated using it. I wanted to use this thing because it makes life easier but unfortunately, I didn't know how to use it. So, I used the manual way [of referencing] which is far better with the aid of Google scholar. I was also talking to my colleague the other day and she was saying that Endnote is frustrating, and she just preferred to use the manual way of referencing (IA3).

When she was probed on whether she received any form of guidance/teaching on how to use Endnote, Akinola elaborated:

I went to the computer lab managers and they installed it for me. They only install it for you, they don't teach you. I still had to go to library staff for them to show me how to use it. For example, how to create an Endnote library. So, somewhere somehow along the way, I was challenged because Endnote would stop working when my laptop needed an update. So, that was challenging for me (IA3).

Joseph and Rose agreed that using digital technology (hardware or software) as a first-time experience may stimulate fear of the unknown.

Joseph: *I think it is the anxiety of not knowing if it is going to work or not. So, it is just a matter of not knowing if it will work for your study or not (FJ6).*

Rose: *It is true you do get an anxiety when you don't know if the software is going to work to your advantage or not. So, the suspense is always there if it is going to be positive or negative experience (FR6).*

Figures 6.4 and 6.5 below indicate an observation of the Endnote software that the participants employed in their studies.

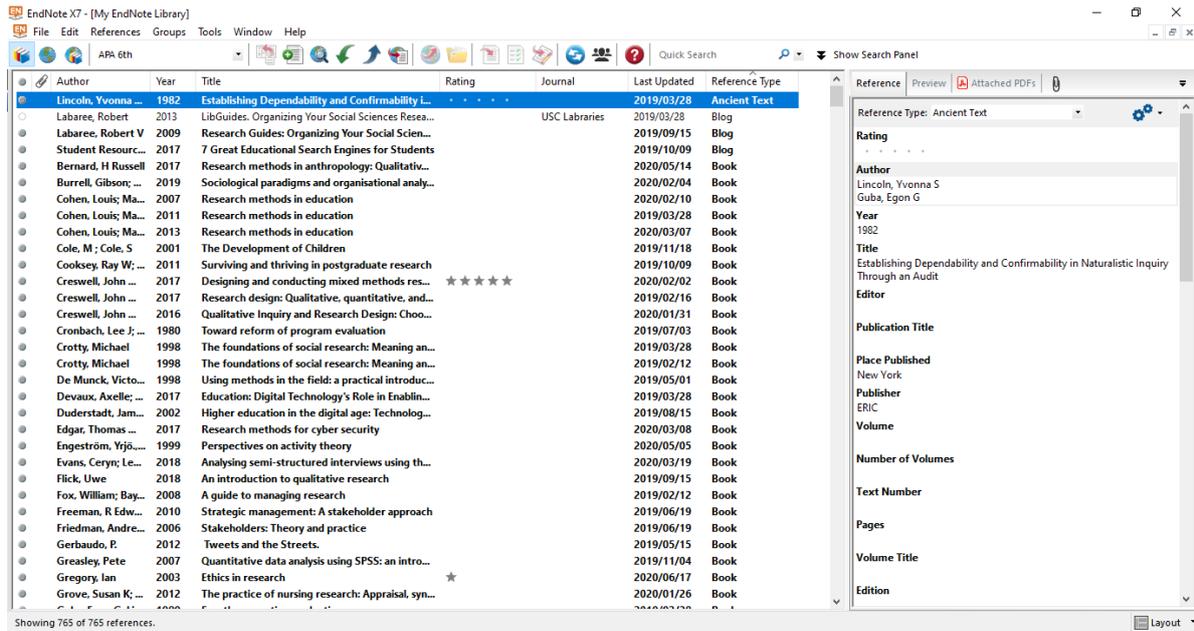


Figure 6.4: Snapshot observation of Endnote software

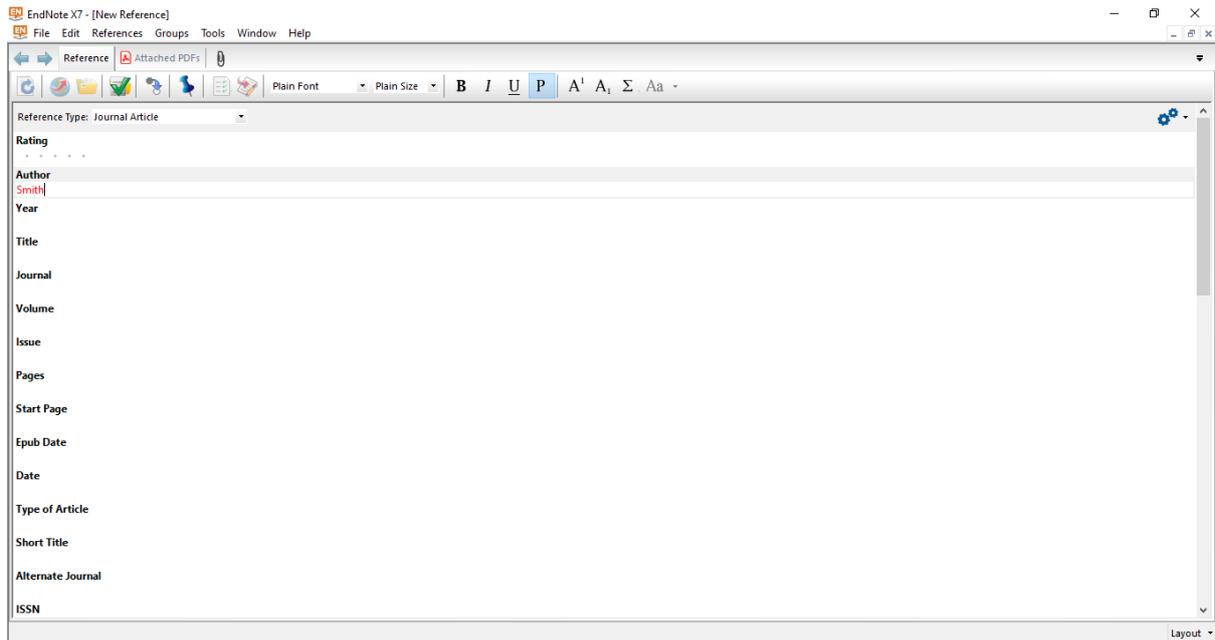


Figure 6.5: Endnote screenshot observation of how to add references manually using the software

On the one hand, Akinola appears to recognise the significance of Endnote in terms of easing the process of referencing. However, because she was using it for the first time and experienced issues along the way, she gave up on it, and reverted to a form of referencing that she was comfortable with. This suggestion is evident in her comment, reflecting words such as “*makes life very easier*” (significance) and “*Endnote would stop working*” (a negative experience). While Akinola believed that Endnote was giving her problems, what I have found through analysing her excerpt is that it may have not been the software that had issues, but her laptop. Her statement of “*Endnote would stop working when my laptop needed an update*” triggered this understanding. In other words, it is her laptop that was problematic, further affecting the functioning of Endnote software. Thus it was because it was her first-time experience with the software that she suggested that issues from it. Yanli (2013) acclaims that Endnote makes referencing easier and improves postgraduate students’ thesis writing experience. This claim is supported in Basak (2015) research work and is also evidenced in Brahmi and Gall (2006) earlier study. In these studies, participants attested to the ease and usefulness of Endnote software in their research studies as it helped them organise references. Unfortunately, this was not the case with Akinola, who preferred manual referencing to using Endnote. It also seems that the training Akinola received from the librarian did not assist her sufficiently in sustaining the use of Endnote in her study. Akinola ultimately returned to manual referencing rather than continuing with Endnote.

Jessie also seemed to have received some form of training to prepare her for the use of Endnote. Basak (2015) also argues that training has a significant impact on using digital technologies in research. The training that Jessie received per the library assistance could have been useful to her. In her case, she did not discontinue using Endnote. In other words, she was patient with the process of learning the use of Endnote in order to be able to use it in her study. What is also striking about her experience is the negative feeling (fear) she expressed about using the software. What could have brought in this fear is the burdensome feeling which was triggered by using Endnote for the first time at a late stage of her research. She had not been aware of the Endnote feature on her Microsoft Word document, even though it had been there all along. In addition, unlike Akinola’s experience in which the use of Endnote seemed optional, for Jessie, her use of the software appears to have been imposed by the supervisor. This imposing is evident in her speech when she declares that “*my supervisor told me to use Endnote*”. This assertion also reveals that some students follow the supervisor’s instructions on the types of digital technologies to use in research.

Another participant (Nkosi) recognised the essence of Endnote software in research but could not continue to use it, as he was already halfway through his study. Contrary to Jessie's experience, Nkosi had an option to stop using Endnote as he was halfway through his research. He shared the following:

So, with Endnote, it's a digital technology for research. I first did it myself and then I faulted a bit then someone [a friend] also taught me about it. Now because I'm at the middle stage of my research I cannot use it, I find it difficult using it but if I had encountered it at the beginning of my research, I would have grasped its use and learnt it then use in my research. So, I almost succeeded with teaching myself how to use Endnote (IN2).

Nkosi was probed further on discovering and using Endnote. Nkosi shared:

I understand how it works and it does make sense but I'm like not now. It makes sense and it easier when you integrate Endnote with your Word document, you begin to type and reference at the same time. As you write and reference in text the Endnote keeps your references but now with me... when I write down the reference [manually], my mind is able to capture it and what the article is about and the person who is writing it. So, I am able to actually know the scholars in the field and what they have to say just by writing the reference and writing down those notes. So, Endnote prohibits me from doing that, internalising key information about my research. Not just theory but even paradigms and stuff (IN3).

Nkosi's experience suggests that Endnote came with a limitation in that he could not internalise some of the research contents that he considered important. This limitation also contributed to the *difficult* experience leading him to stop using the software. Nkosi also seems to be self-reliant when referencing in his study: he prefers to do it himself manually instead of using a software. In addition, for Nkosi, Endnote was not suggested by his supervisor. Such might have impacted him being able to stop using it as it was not formally introduced in his research. Thus, it appears that if Endnote is not officially introduced to students, they have the option to stop using it (Akinola and Nkosi). However, if using Endnote comes as an instruction from the

supervisor, students have to continue to use it despite their negative experience with the software (Jessie and Shawn).

One participant (Shawn) talked about his progressive experience with Endnote as instructed by his supervisor. In the extracts below he explains how he started off with a negative experience. However, through interacting more with the software, that experience was transformed into a positive.

Shawn said:

Aaah! (Expression) I would feel so discouraged at times. You know when my supervisor says “this Endnote is not supposed to be like this, I told you to do this and that”. So, I would say to myself, but this is a software, there is no way I can edit it. He would say “remove these initials, I don’t want these initials on the citation, change them”. I would think how then do I remove these initials because they were done by Endnote, I just extracted the document from the internet and it automatically referenced in Microsoft Word. Therefore, if it doesn’t remove the initials what must I do? I would be so challenged at times but luckily, I had a lot of people who gave me a lot of support (ISh5).

Shawn’s experience indicates that he received a professionalisation instruction from the supervisor. He is also expressing a socialisation statement (having used Endnote on his own before the instruction). Thus, when people use digital technologies socially (without instruction), they break the laws/rules and blame something/someone. In this case, Shawn blamed the software after breaking the laws of referencing: the software produces initials in the citations if there is inaccurate information in the library.

Further commenting on his progressive experience, that is, after realising the significance of professional instructions, Shawn revealed:

For instance, with Endnote, you may say Endnote is difficult, but then you need time to practice it after having been taught. There are so many things that you can do using Endnote because it is an automated thing. So, I can say the experience that I have had is very good. Now I am so proud of myself, like I really want to help other people on how to use digital technologies because I am like an engineer now (ISh5).

Therefore, Shawn first expressed his concerns about using Endnote for the first time. It seemed that he did not understand how the software operated. What may have made him warier of Endnote working for his study was the instructions he received from his supervisor. His supervisor did not explain the instruction, instead merely indicating referencing expectations. Nonetheless, Shawn appeared happy with himself after receiving the support he needed from his associates. As evidenced by the words such as “*I am so proud of myself*” and “*I am like an engineer now,*” Shawn has internalised Endnote’s use in such a way that he can share his knowledge and skills with others. When a user becomes competent at using new digital technology, this brings about transformation in practice (Yamagata-Lynch, 2007). In Shawn’s case, the change was evident in his confidence in using Endnote gained over time with support from relevant stakeholders, such as his friends.

When it came to using new digital technologies in research, Crystal referred to her experience with the SPSS software, which she used to analyse quantitative data findings that were presented in the form of graphs. The following extracts reflect what she had to say of her experience with the software:

For master’s I’d say what is new is the creating graphs now on my own [on the SPSS software], but we were shown this software during Honours. However, someone else assisted with the input of data. For master’s, it is my very first time inputting the data on my own which is a tedious and time-consuming experience, but we did use this software last year during Honours (IC3).

Crystal was asked how she experienced with the software for her master’s study. Crystal said:

I would say it is confusing because creating that standard deviation and mean, you don’t really know how to interpret it. So even if you do create it, you don’t know what you are interpreting. Is it proving what you said or disapproving it? In that case, the interpretation is quite confusing (IC4).

Crystal added:

I definitely need some more training and my lecturer did say that when I am down at campus again, I should let her know in advance so that she can set up a date with other students where she can show us how to use SPSS (IC4). Crystal was probed

further, seeking to discover whether she knew any persons responsible for SPSS training at the university. Crystal responded:

Not that I know of. I just know that there are people at the computer labs who are responsible for installing these software on your laptop but other than that I don't think there is anyone who can assist besides the supervisor (IC5).

Similar to Akinola's experience (for Endnote), Crystal received some exposure to SPSS. However, this exposure did not seem to be enough for her in her master's experience. Crystal needed more teaching sessions on the use of SPSS. Also, it appears that if minimal software training is received, the student experience is often exhausting and negatively affected. Moreover, Crystal seems to have a high dependence on professional training for SPSS to be useful in her current master's study. On the same note of first-time use of digital technologies, Nthabi also spoke of her experience using a tape recorder (hardware). From the extracts below, Nthabi experience seemed to have followed the socialisation route, as started by trying the tape recorder use on her own. Later, Nthabi realised that she did not know the correct laws/rules of the technology (trial and error methods). In other words, she had used the tape recorder without formal training (professionalisation experiences) (learn and do/use according to the prescribed/correct rules). Thus, the socialisation experience involved learning to use digital technology on one's own through trial and error, being helped by other people's opinions (do and learn). Drawing from her experience, Nthabi explained:

So, for when you are collecting data, we are supposed to use the tape recorder. It was my first time using it and it was a bit challenging because I remember this one time, I was conducting an interview and I thought it was active or switched on. That experience was so bad because we had to start again but we learn every day, hey. I was so disappointed because the previous day I had practice to use it since it was new to me, so I thought I had mastered this thing only to find out the next day that I did not press the start button. It was so bad but at least my participant was not that hard on me (INT3).

Nthabi was asked if she had learned to use a tape recorder previously. Nthabi said:

I had the manual that came with the tape recorder and I was on my own. I needed to put in so much effort into using the tape recorder. So, I only used it for the interviews, and it was my first time and probably the last to ever use it (INT7).

Nthabi expressed dissatisfaction with using a tape recorder. She had experienced difficulties when she used the hardware for the first time while interviewing a participant. Dwivedi et al. (2019) negotiate that people consider digital technology useful if easy for them to use as a first-time experience. This finding was in contrast to Nthabi's experience. Nthabi confronted challenges when she used the tape recorder for the first time, putting her off using it again. One could argue that the tape recorder may have been useful to Nthabi, allowing her to conduct the interviews; however, seemingly, this was not an easy experience. Descriptions such as "*that experience was so bad because we had to start again*" and "*I needed to put in much effort*" suggest the frustration with using the tape recorder in Nthabi's experience. Using the tape recorder driven by the socialisation experience, Nthabi had to learn on her own through trial and error, leading to a negative experience when actually conducting her interview.

The participants' experiences, therefore, seemed to be negative in terms of professionalisation experiences (learn and know the rules first before you use it) compared with the socialisation experience (use it and try to understand the rules through trial and error). Furthermore, in the other accounts discussed above, participants started with the socialisation experience and later sought the professionalisation experience (they went to LAN or library managers to learn the correct methods of using technologies after they had failed to use such technologies independently). These participants ultimately experienced personalisation, it becoming habitual to socialise with technologies and then ask for professional training. These habits generated some personal values such as independence (Nthabi), patience (Jessie), self-reliance (Nkosi), progression and transformation (Shawn), satisfaction (Nthabi and Azania), effort (Azania), and dependence (Crystal).

6.3.2 Sub-theme 2.2: Haphazard introduction of emerging digital technologies, especially during the COVID-19 period

This sub-theme arose from participants' responses to ways in which they used emerging digital technologies to adapt to the COVID-19 lockdown restrictions. When asked about the usage of

emerging digital technologies as a result of the COVID-19 pandemic, Gcinile clarified that, without in-person assistance, it was difficult to develop familiarity and proficiency in new and emerging digital technology:

Other than Zoom, there are no new digital technology devices that I use. I defended my study using Zoom, and I was assisted by my supervisor to prepare because I didn't know anything about Zoom until I met with her. Before meeting her, she said we must consult one of the students who had already downloaded Zoom, but I did not have data at that time, so I had to buy data for myself and then do the dry run with her prior to the defense date. We had our meeting and that is how I got to understand the use of Zoom. With technologies sometimes you need to talk to people to understand how they are used. So, she made things easier for me (IG9).

From Gcinile's response, it seems as though the university did not have a formal introduction to Zoom for master's students. This haphazard implementation of Zoom was apparent in how peers supported Gcinile to understand usage. The use of Zoom in research was apparently not properly introduced to students by the university- as Gcinile had to rely on the skills and expertise learned from other students when she had to defend her thesis via Zoom. Thus, Gcinile needed to develop good interpersonal relationships with her fellow students and supervisor in order to learn effectively from them. Before defending her proposal through Zoom, Gcinile performed a dry run with her supervisor and a fellow student (through collaboration). This dry run made it easier for her to understand the software. Dudu also identified an ad hoc approach to integrating and implementing emerging digital technologies. Dudu:

The full digital practice is something that just happened haphazardly. Some digital technologies were not introduced properly, and we couldn't familiarise ourselves with how to work with them. For example, I had used Zoom once as a participant of a study, but my supervisor did highlight to us that we could meet via Zoom if we wanted to. We haven't used that platform yet, but I think I would be able to use it because I have seen how it works, and it is something that is useable. I only communicate with my supervisor via WhatsApp and emails, and we haven't arranged any Zoom meetings (ID17/18).

Experiences of Gcinile and Dudu showed that students learned to use Zoom in a variety of ways. For example, Zoom was one of the many emerging digital technologies that could be

used to maintain connectivity during the COVID-19 lockdown constraints. It was up to the student to determine whether the software was useful for their studies (a personalisation experience). Mpungose (2020b) emphasised the importance of students identifying digital innovations that are beneficial to their studies, to meet their individual learning needs — in this case, their research needs. Therefore, it is essential for students to be self-aware and be aware of their study needs.

Thabo's comments regarding Zoom showed that he was aware of his personal research needs, but that he did not believe Zoom was appropriate for his research. He elaborated: "*I have heard about Zoom but I don't know what it is, I have never used it, and I don't intend to use it.*" Despite hearing about Zoom, Thabo was adamant about not using it for his research. Thabo's decision not to use Zoom may have been motivated by him reading literature and writing his literature review at the time. At this point in his study, Thabo may not have seen the need for Zoom. What is striking about his argument, however, is his outright reluctance to use it, despite the fact that he is still at the early stages of his research, and still formulating it; despite Zoom being useful for engaging with stakeholders to discuss and present research. Thabo appeared to be resistant to new technology beyond simple Internet use, and he appeared closed to technology in general.

Even though Zoom was haphazardly implemented by the university at which the master's students were enrolled, Crystal stressed its practical utility for improving other technical skills during the lockdown:

Last week we had a Zoom meeting so we could see each other, and we were discussing issues about this other software that I am working with. I am working with SPSS for my thesis and she [the supervisor] showed me via Zoom screen sharing how to make certain graphs and how to insert certain data in the software in order to strengthen my research (IC10).

Crystal and her supervisor were able to explain and transfer technological skills as a result of using Zoom's real-time, face-to-face chat. Students' willingness to treat emerging technology as a medium in which advancement can occur at any time, according to BrckaLorenz, Haeger, Nailos, and Rabourn (2013), allows them to adopt or seek emerging technologies to meet their needs. Therefore, Crystal was able to integrate Zoom into her research experience. Crystal could meet with her supervisor remotely, being aware of how emerging technology can

progress and evolve. Crystal's use of Zoom software was also clearly guided by a professionalisation experience, using it to address issues relevant to her research and in acquiring additional SPSS skills. During the lockdown, several universities called for the use of Zoom digital technology (Major et al., 2020). However, even though it is unclear who suggested that Crystal use Zoom, her experience with the software is obviously motivated by professional interaction. All four participants in this Sub-theme seemed to have tolerated the confusion brought on by the COVID-19 pandemic by creating new identities and using emerging digital technologies that 'worked' for them in their individual studies to help them meet their personal study needs. The following figures provide a visual representation of the Zoom software.

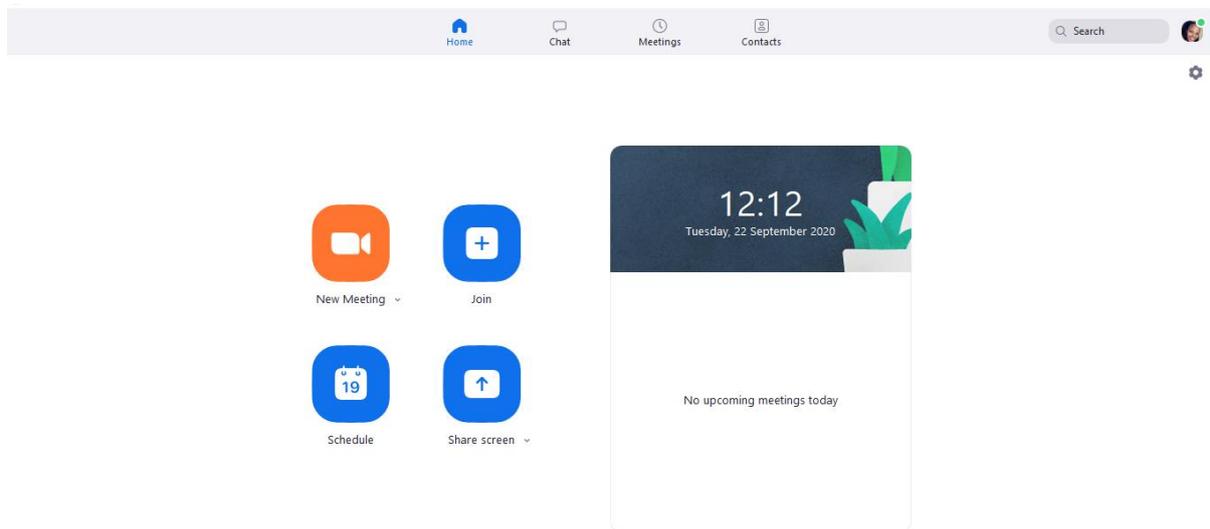


Figure 6.6: Zoom software snapshot indicating the home page

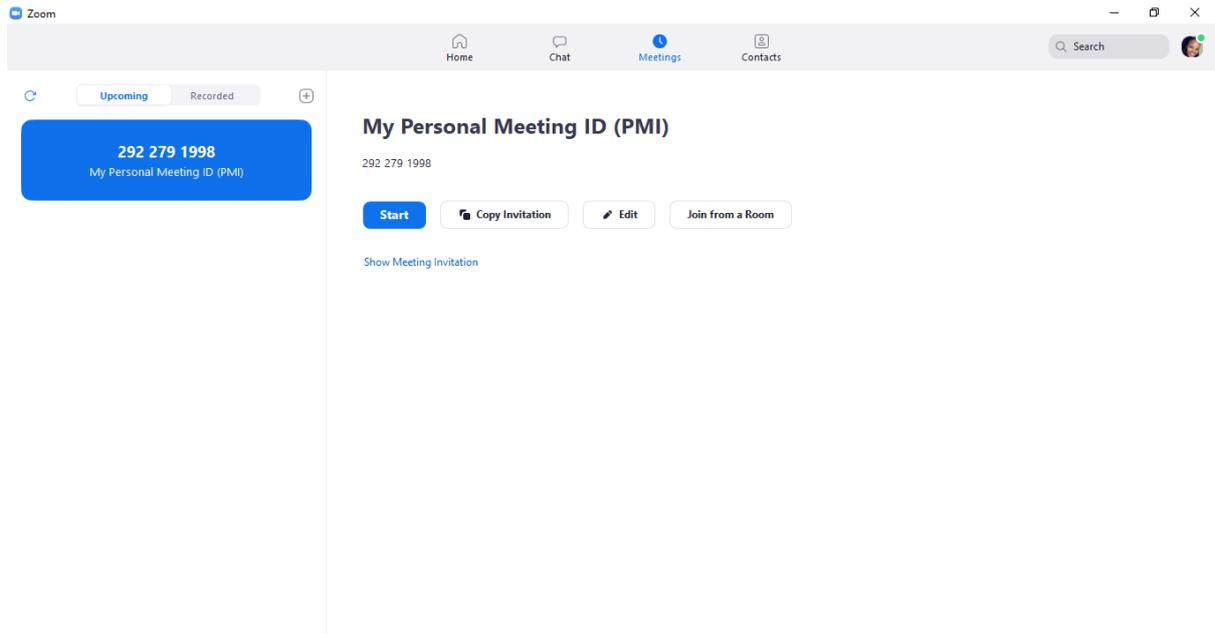


Figure 6.7 Snapshot of Zoom indicating a scheduled meeting

6.3.3 Sub-theme 2.3: University-recommended digital technology

This sub-theme discusses participants' experiences with digital technologies recommended by the university (Turnitin and Grammarly software). Student experiences mainly highlighted that these software were compulsory for them to use, some indicating their supervisors' strong suggestion of using them. Furthermore, what was prominent in this Sub-theme, was that the majority of participants expressed their frustration with using Turnitin software. Turnitin is a software that was developed to detect plagiarism on academic journal articles, assignments, and theses (Zuma, 2020). Plagiarism refers to academic theft in which a person duplicates the ideas of another without acknowledgment (Vithal, 2020). When asked about her experience with the Turnitin software, Azania expressed the following:

Oooh Turnitin!! It's a nightmare, an animal that nearly killed me. I used Turnitin to check plagiarism and my experience is that it is good because it tells you if you have copied someone's work or if you have paraphrased or referenced properly but you have to do it regularly, chapter by chapter so you are aware of your plagiarism percentage. If you put your work in Turnitin at the last phase of your research, you are in trouble. Take myself for example, I put my work on Turnitin when I had to submit the following week and I received 60 something percent. So, I had to start off everything again. My confusion was that it also highlighted chapter headings as plagiarism too, for example

chapter four, the methodology and everything. So, I had to re-do especially where I did not reference properly. It went down to 9 percent and then I was fine, but the experience nearly gave me a heart attack because I had to spend about four weeks doing that activity of correcting plagiarism. I had to have 10 percent plagiarism in order to have my thesis marked (IAz5). It is compulsory digital technology because it is within the university policies and I don't think they can mark your thesis without a Turnitin certificate. You have to attach the Turnitin report at the end of your thesis (IAz6).

Azania's experience with Turnitin suggests that she understood the purpose and significance of the software, even though she did not have a smooth experience with it. Her sentiment "*it is good because it tells you if you have copied someone's work*" indicates that she understands the usefulness of Turnitin in research as far as detecting plagiarism is concerned. However, her experience was negative in having to edit her work to lower the Turnitin plagiarism similarity. This process appeared to be a long and daunting one. Azania experienced some challenges. Azania's experience of turning in her work at the end when she completed writing her thesis made it burdensome and time-consuming. Depicting her experience with Turnitin as a "*nightmare*" or as "*an animal that almost killed her*" indicates her negative experience with the software. This "nightmare" experience also seems to have been triggered by the confusion of having to re-work the chapter headings (e.g. the methodology chapter), which come as mandatory headings for a master's' thesis outline.

In addition, Azania seems to understand the socialisation aspect. When people socialise, they talk about percentages drawn from other people's opinions (not university rules). The common percentage at this particular university appeared to be around 10% to 20%. Having read and understood the plagiarism policy of the university in which the master's students were enrolled, I found that there is no rule that informs staff and students about the 10% similarity index, plagiarism not being quantitatively measured (Vithal, 2009). Thus, the percentage only indicates similarities, not plagiarism. Therefore, when Turnitin is used for the professionalisation experience, it becomes a resource for detecting similarities in order to punish the offenders who plagiarise. When Turnitin is used for socialisation it becomes a resource for detecting content similarity, in order to educate the students (Zuma, 2020). In Azania's case, she had to learn how not to plagiarise when writing, by lowering the similarities

indicated by Turnitin. One has to check from the similarities whether there are parts of the thesis plagiarised.

Rose also pointed out frustrations with her experience of using the Turnitin software:

It has been fun and hectic at the same time, as well as frustrating because as much I have used Turnitin in my undergraduate experience, but it is more challenging to use it in my master's study. This is because I use it frequently after every chapter, so I put each chapter on Turnitin and it brings feedback. I then have to do corrections and turn my work in again until it is at zero percent or one percent which is very much frustrating. It says when you're doing your research there's a certain percent of plagiarism that you have to have and our supervisor doesn't even want ten percent but way less than that. So, Turnitin looks at whether you have stolen someone's work, or it is your own. When you take your study and put it on Turnitin it will identify all the work that is not your own and it will tell you where that work comes from including the author and place of publishing. So, it looks at all those things. I'd say most of the time you do write something in your own words only to find out that somebody has written the same thing before without you knowing. And then it identified as plagiarism. And what's more frustrating is when you write your title, and it tells you that it is not your own words. All those things are too frustrating (IR9).

When Rose was probed on what makes the experience of using Turnitin fun, she said:

It is fun because when you write your research and submit it makes you gain more knowledge. For example, finding different ways of writing, different ways to define different things, changing the words, it's all fun (IR9).

Similar to Azania's experience, Rose had something good to say about her experience with Turnitin. In a sense, it was "fun" for her to discover new ways of writing when she had to reduce the number of similarities by paraphrasing her work. Nonetheless, while Rose shows this fun side of her experience, she opened up more about her negative experience with Turnitin, in which frustrations were prominent. This exasperating experience appeared to be enforced by her supervisor, who required her to have a zero percent Turnitin similarity report. Such differed from that required from Azania (10%). Rose's experience validates what I discovered from reading the university plagiarism policy: there is no officially stipulated

similarity percentage index stated; hence supervisors will instruct students differently. Thus, students usually comply with the opinions of the people they consider important in their studies regarding the use of particular digital technologies (Alwahaishi & Snásel, 2013). In this case, Rose followed her supervisor's (an important stakeholder in her research) instruction to decrease the Turnitin similarity percentage to almost zero for every chapter, which became frustrating for her.

Furthermore, having Turnitin highlight that her study title was plagiarised seemed to have caused more resentment for Rose and appeared to be a limitation of the software itself. The Turnitin software for Rose was a *hectic* experience. Such negativity may have been exacerbated by her frequently having to submit her work to Turnitin, chapter by chapter. This frequent submission was something new in her master's experience, especially having used Turnitin before (undergraduate study). Rose's experience differs from Azania's, who submitted her entire dissertation on Turnitin only upon completion.

Another participant (Jessie) spoke about a negative experience with Turnitin. Unlike Azania and Rose, who first indicated something good about Turnitin (during master's study), Jessie drew her response solely from her negative experiences with the software in research. For example, in the following extract, Jessie questions the trustworthiness of Turnitin software because of the challenges she faced while using it. She noted:

Whoa!! (Expression) Why must we open healing wound because I was starting to heal. Number one, I feel like Turnitin is not reliable because how can it highlight words such as teaching, learning and education because we are all in the same campus or School of Education, so all of us will use such terms. So, basically, I used Turnitin to check plagiarism percentage and why I always feel like uyasigoqa la (it is not reliable) is because there are a lot of students that are supervised by my supervisor so why then highlight my supervisors name as plagiarism? I am not stealing that I am supervised by Dr [mentions name of supervisor]. So, my experience with Turnitin has been bad especially with my postgraduate masters' study because I didn't need Turnitin for my Honours study. For my undergraduate study it was good because it a matter of paraphrasing and synthesising the articles. For my master's study the percentage was still high even though I had paraphrased but it went to 16%. Removing the 6% was a

nightmare, I felt like I had done a lot and it should just sit at 10% but it didn't because it kept on highlighting those common concepts such as education, the university and the entire declaration. Everyone had submitted so we submit the same declaration from the university, it also highlighted my student number because I have submitted to Turnitin before. I still use the student number I used for my undergraduate study. It feels absurd, like I copied my student number really? It wanted me to change those words and there is no way I can change teaching and learning because it is going to change the whole meaning of what I am trying to discuss. I ended being angry and frustrated and what I did was I removed the declaration page, cover page and references. Only then I had received 6% and then I didn't change anything (IJe10).

While Jessie recognises the good experience with Turnitin during her undergraduate study, she expressed the total opposite for her postgraduate master's study. In the above excerpt, Jessie considers much in her account. What is particularly interesting is the many negative feelings she reveals regarding her experience with using Turnitin. For the second time, the experience of using Turnitin is viewed as a *nightmare* because of the exasperating process of lowering one's plagiarism percentage to fit the ten percent requirement (first Azania and now Jessie). The participants appear to have had to paraphrase repeatedly and alter words commonly used in their field of study, which Jessie regards as *absurd*. This process also seems to have simulated *anger* and *frustration* for Jessie, which is similar to sentiments expressed by Rose.

Zuma (2020) reveals three types of plagiarists- accidental, opportunistic, and committed plagiarists. An accidental plagiarist is one who plagiarises unintentionally and thus needs to be taught how to improve their writing skills. Opportunistic plagiarists refer to people who plagiarise intentionally, resulting in unethical behaviours of copying other people's work. Committed plagiarism involves stealing other people's work, even after cautioning (Zuma, 2020). From the above cases, it seemed that all three participants- Azania, Rose, and Jessie- accidentally plagiarised. They were unaware of their plagiarism and were surprised by the similarity reports. They had to find ways of paraphrasing to mitigate their similarity report.

In a focus group discussion on using Turnitin in research, Crystal said:

I hate Turnitin so I don't do chapter by chapter submission. I just surprise myself at the end and deal with it then because it is so difficult when you are busy writing and you get millions of corrections from the supervisor for you to do, that on its own is a lot. So, that is why I deal with it at the end, and I try to deal with just writing the chapters first thus I haven't submitted anything on Turnitin yet. I try to get my work right before submitting to Turnitin (FC7).

From the above comment, Crystal implies that master's students also choose when to submit to Turnitin (chapter by chapter or at the end). Also, adjusting the Turnitin similarity percentage (in case it is high) seems to be a massive task for the participants (Azania, Rose, Jessie, and now Crystal) to the extent that Crystal expressed feelings of hate for having to engage in it. A study conducted by Khoza (2015a) indicated that some high school teachers had prepared workshops to provide support and guidance (on how to avoid plagiarism) for students who received a plagiarism percentage that was higher than ten. However, on the present findings above, none of the participants (accidental plagiarists) attested to such initiatives from their supervisors. Three participants (Azania, Rose, and Jessie) only referred to their lonely experience of reducing the similarity independently, without their supervisor's help. A similar experience was evidenced in Özbek (2016) study in which students who had a high Turnitin similarity percentage were not assisted by their teachers in lowering it in their assessment.

A study by Orlanda-Ventayen (2018) revealed that teachers can also submit students' tasks on Turnitin for the students. In this study, three participants (Shawn, Thabo, and Joseph) similarly echoed that they had not submitted their work to Turnitin unaided. They attested to having their supervisors submit on their behalf. However, even though their supervisors submitted their work to Turnitin, students were still responsible for the corrections if there was a high plagiarism percentage cited. What is intriguing about their experiences is that contrary to the experience of Azania, Rose, and Jessie, they did not find any issues with using Turnitin. They shared the following:

Shawn:

aaah Turnitin!!! (laughs) my things had to go through Turnitin, it's compulsory here at school to check the percentage of plagiarism so that I can edit my work if it is high to at least 9%. Turnitin is not difficult because it is done by the supervisor than me. So, I have not experienced any difficulties since I have also learnt how to reduce

Turnitin percentage from another guy at the university who was a professional staff (ISh7).

Thabo:

With Turnitin, it is now more critical because I don't even submit for myself. My supervisor has her personal assistant who does it for us and reports back to us what percentage we received and how to go about reducing that. So, now our hands are tied even if you have the skills of robbing Turnitin. You just cannot do it because we are not submitting for ourselves (IT8).

When initially asked about his Turnitin experience, Thabo first drew from his previous undergraduate study experience with the software. Thabo elaborated:

Turnitin, I used to crack it back during undergraduate study. First of all, I didn't understand how it was supposed to help us. I think it is there to put pressure on us as students. I used to plagiarise a lot that time and Turnitin did not stop me from doing it and that is why I say sometimes it is useless because the lecturers do not go back to verify if we actually did not plagiarise. It was said that we shouldn't get over ten percent of plagiarism but what I normally did was, I would get twenty two percent which is more than required percentage and I would find ways to remove the one digit to be left with two percent. So, I would submit a report with only two percent but on the system, it wouldn't have changed (IT7).

Joseph claimed:

I don't think I have an experience with Turnitin because my supervisor put my thesis on Turnitin, so it was less hectic for me. I just had to do the corrections afterwards (FJ7).

Multiple implications arise from the above findings. One, participants seem to have a better experience with Turnitin if the supervisor submits on their behalf. Two, the participants whose supervisor submitted for them on Turnitin do not seem to complain about going through their work, reducing the similarity percentage. Thus, the idea (factor) of having a supervisor submit on Turnitin on behalf of the student may have propelled these students to learn not to plagiarise (for example, Shawn learning from a professional stakeholder at the university). Thabo appeared to be an opportunistic and committed plagiarist. He is concerned with manipulating Turnitin software to gain a lower percentage (which he taught himself to do as an undergraduate

student). It is also interesting how Thabo saw nothing wrong with his repeated unethical behaviour in his professionalisation experience. Nevertheless, for master's study, having another person submit to Turnitin on his behalf helped Thabo maintain ethical behaviour towards using university-recommended software.

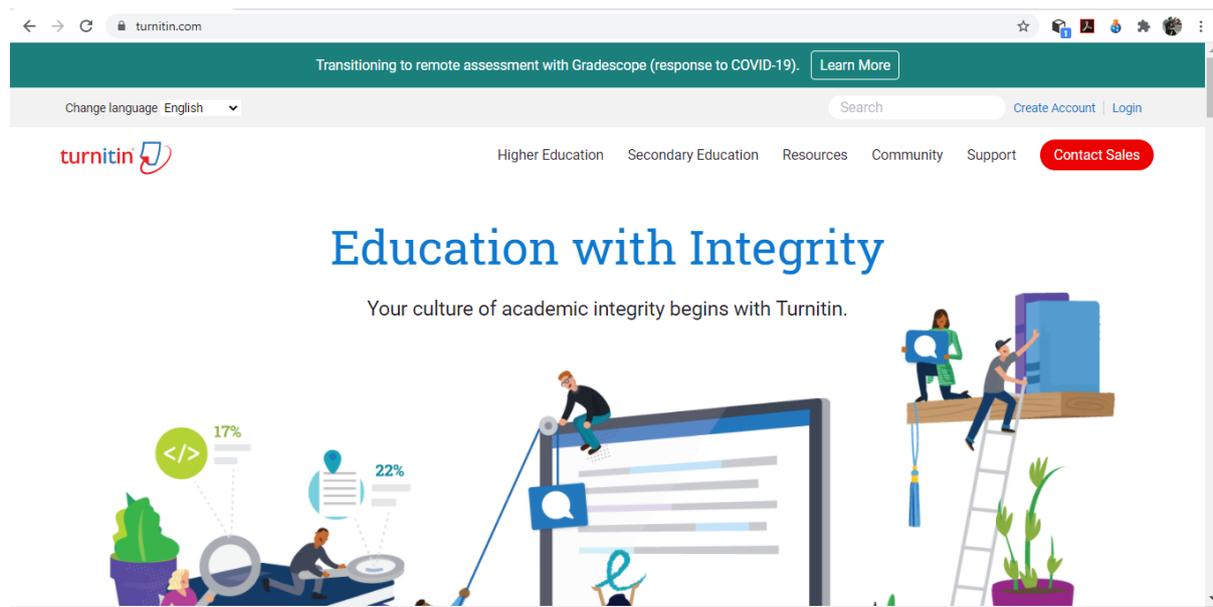


Figure: 6.8 Snapshot of Turnitin website

On university-recommended digital technologies, Crystal discussed her experience of using Grammarly software as a mandatory practice stressed by her supervisor. Crystal:

Grammarly is this irritating software that I don't like. It tells me my mistakes, basically it works like Turnitin, but you use it while you are writing by correcting your spelling and other grammar issues. So, it gives you suggestions on how you can write your work and I find it annoying because it could make you change the title of your study. For example, if your title has "women in South Africa" it would suggest for you to change it into "ladies" and you would have to do that for your entire dissertation. Or that would come as an error when I submit meanwhile it is the title of my study so to me, I find that annoying. My lecturer instructs me to submit to Grammarly before

submitting to her and it's been a crazy experience for me because the Grammarly I have doesn't allow me to submit the whole thesis but upload page by page and I don't have the time for that. So, I even emailed my supervisor to say maybe she must share her Grammarly with me because she says hers doesn't have this problem, but she wants me to submit using Grammarly. I am still waiting for her response and she says it's free, but I am not sure if she is using premium, that one is charging me, and I don't have forty dollars to pay. So, I am having huge problems with Grammarly and I prefer Turnitin which I deal with at the end of it all (FC8).

When she was asked whether she was ready to use software such as Grammarly in her master's research Crystal said: *I was not ready and I am still not ready for it and I am still not happy with it (FC10)*. Additionally, seeking to find out whether Grammarly was a compulsory software to use in university and her research, she elaborated:

I think the university has made it compulsory for us to use it because I submitted my first draft to my supervisor, and she sent me this link and this message to say I needed to download Grammarly in order to submit my work via this software because she is not going to mark it if it is not submitted via Grammarly. So, that is why I think now it is compulsory. I am finding it a bit difficult because if I am trying to upload, I can't just upload the whole document, it will say that it is too big. Then it will also say I have three hundred and eighty-one corrections (381) to make, and I would go line by line correcting it according to the Grammarly suggestion. It then goes back to three eighty-one and I don't know what's actually going on with it (IC3).

Similar, to Crystal's experience, Dudu used the Grammarly software on her supervisor's instruction. Discussing her experience with the software, Dudu explained:

I still feel overwhelmed especially if I am using a digital technology that is new. I think I wrote it also in my journal that my supervisor advised me to use this programme called Grammarly that one can use to edit their work. I didn't know about it, I was only familiar with the software that is on the computer that I use to check grammar. Grammarly edits your work and paraphrases your sentences. You just put your work there and it highlights and edits it so you do not have to take your work to the editor. So, he just told me that you just put the document on the software and that the programme will highlight the things to be corrected. He said whilst I am editing my work I will still be learning because if I take my work to the editor, I will not learn

anything. If I'm doing it for myself, I will see mistakes and learn what to do and what not to do as I write sentences. So, while I am using it, I am also learning new ways of using digital technologies at the same time learning how to write using the correct grammar, paraphrasing, new words and sentencing (ID5).

Moreover, in the focus group when other participants were discussing their experiences with using Grammarly in their research, Rose commented:

Yin yani yona leyo (what are you talking about?) Maybe if you use a different term I would know what you are talking about (FR7)

The above extracts from the participants (Crystal, Rose and Dudu) imply that, even though Grammarly appears to be a university-recommended software, it was not formally and properly introduced to all master's students by their supervisors. Some like (Rose) state that she has never heard of it. Rose's response suggests that nobody in her research community had introduced her to the Grammarly software; therefore, she had no clue about it. On the one hand, Crystal's experience shows that she did not enjoy the use of Grammarly. She expressed feelings of *irritation and annoyance*, which further indicate her negative experience. Her use of words such as "*my supervisor instructs me*" and "*she is not going to mark it if it is not submitted via Grammarly*" implies the mandatory use of the software. It also seems that she has not fully grasped the use of Grammarly, as she struggled with editing her dissertation using the software. As a result of this lack of understanding, Crystal found it *difficult* and *time-consuming* to use it. On the other hand, Dudu only expressed having an overwhelming feeling triggered by the new experience with the Grammarly software. Therefore, even though she started with a negative experience with the software, she accepted Grammarly and seemed to have worked effectively with practice and a clear rationale for use.

6.3.4 Sub-theme 2.4: Experiences of storing research information in software and hardware digital technologies

This sub-theme was derived from participants' responses on their use of various digital technologies to store their research-related files. The participants were asked where they stored their research information. The participants stated that they used a USB flash drive (hardware), laptop, or a computer hard drive, student drive (from the university), and Cloud (software) digital technologies. As a negative experience, some participants specified that they lost their

research work stored in hardware digital technologies, such as USB flash drives and laptops. The following extracts present participants' experiences with the above-mentioned digital technologies:

Jessie stated:

I use the hard drive, USB flash drive and lately email to store my work. I have been using the USB because everyone uses a USB, and it was safer to use it. I didn't know that we can save our work in a student drive and I didn't know that you can email yourself to save work, so you don't get to lose it. I have been using a USB, but I forget a lot, so I would plug my USB on the computer and when I leave, I would leave it behind and lose everything. So, that has been happening even though I have been trying not to be forgetful as much and I store my dissertation there. One day I forgot it at the library printer, and I was about to submit my dissertation for marking and I felt my whole world crumble because I had everything in there. I felt like dying and I felt stupid because I know these things happen, but I keep on saving my work on a USB. I should have done dual saving which is saving on my email and USB (IJe7).

Sinowethu also presented a similar scenario on losing his work stored in a USB flash drive:

Last year I had a bad experience where I lost all my references before I submitted my proposal for defence. I had to look for my references again. After the incident, I told myself I will be using Endnote from thereon to make sure I don't make the same mistake again. I had written them in a separate page and stored them in my USB flash drive then I lost it. At least it was just references, on my USB, I had saved the other stuff in my computer drive. That was the general plan of saving my work from other students, to save in the drive and USB. So, I followed them by saving my references in the USB and forgot to save in the drive and that is how I lost my references (IS3).

Azania shared:

yhoo! (expression) I got in trouble when I lost my USB flash drive, and I was saving all my articles and thesis chapters in a USB which was stolen. Luckily for me, when I emailed my chapters to my supervisor, she had the chapters and she emailed them back to me. Otherwise, if I had not been emailing my thesis chapters to her, it would

have been a disaster. That is why is important to email your work to yourself and also save it on the computer then the USB flash drive (IAz5).

The above experiences suggest that it is not safe to store one's work in a USB flash drive alone, as all three participants (Jessie, Azania and Sinowethu) attested to having lost their work stored in a USB flash drive. However, it appears from the extracts above that the USB flash drive as a storage platform is not the problem. The participants themselves are responsible for losing their files stored on a USB flash drive (forgetfulness). For instance, Jessie admits that she is a forgetful person by nature, Sinowethu and Azania also revealing that they lost their USB flash drives. Additionally, Jessie indicated that she was not aware of saving in other devices such as the student drive; thus, saving using only one hardware (USB flash drive). Arguably, this unawareness contributed to her negative experience of losing her work. Had she also saved her work in other spaces, had she been aware of these, it could have been a different experience for her. Sinowethu's use of a USB flash drive for storage was informed by his socialisation experience. He followed what other students were doing, which was not a formal instruction. For Azania, although she lost her work, she was able to retrieve it again from her supervisor via emails. These experiences also suggest that participants learnt from their experiences. They thus preferred to save their research files in software digital technologies such as emails and Endnote.

Building on the information he provided in the reflection journal, Moosa shared how he began to use cloud (one-drive) services to save his work driven by a professionalisation experience. Moosa:

There is this software called one-drive, I only started using it for my master's because kwenye yama (in one of the) cohorts there was this person who attested to losing their whole thesis when they were about to submit because they only had their USB as back up and laptop. So, this person was hijacked and lost their work. So, I asked myself which other place can I use to save my study work to a point where if I come across the same problem, I still will be able to back up my study. I came across One-drive I signed up and they allocated space for me and I have 25gigs to save on cloud. So, I saved everything there whenever I work with my word document it AutoSaves on cloud (IM5).

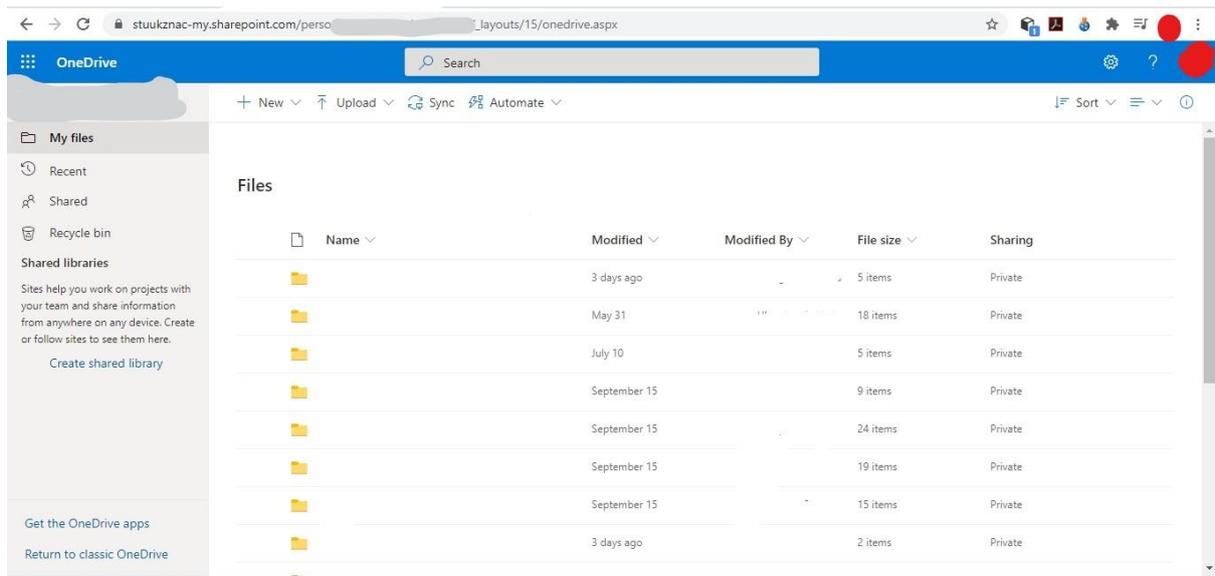


Figure 6.9: One-drive cloud service

For Moosa, his professionalisation experience (cohort) of hearing other researchers losing their work stored on a USB flash drive and laptop drove him to learn more about cloud-saving service. His experience also suggests that he is a self-driven researcher who followed instructions to sign up for one-drive software, to avoid a similar experience (of losing research work).

Other participants acknowledged the existence of cloud services; however, they appeared to be uninformed about how it operated. Rose explained:

I am aware of it, but I don't remember using it. I do have it on my phone and laptop, but I have never had an interest in finding out what it is about, but I do know that the information you store in your phone can also be stored on cloud (FR9).

Azania echoed:

Ya mina ngiyawazi but angazi usetshenziswa kanjani (I know about cloud, but I don't know how it works). I am not using it, I don't know why, I just save my work with Google (FAz10).

On the one hand, both Rose and Azania seem to be unaware of the use of cloud services in research. This unawareness may be a result of not understanding the significance of saving files on cloud services, as stressed by Moosa in his experiences. Thus, for Azania, her ignorance

seemed to have cost her to lose her research work, only learning from that negative experience about saving emails but still not using the cloud.

On the other hand, Dudu had an interest in understanding the use of cloud services. This enthusiasm to learn appeared to be driven by her previous experience of losing some of her work saved on a USB. Dudu: *mina angiwazi but ngingathanda ukuwufunda because I have lost umsebenzi wami (articles and dissertation) kwi laptop and ama USB. (I don't know what cloud is but I would love to learn about it because I have lost my work through using a USB and laptop)* (FD10). These participants' experiences in employing certain digital technologies and not others highlight their unique personalisation experiences informed by their research needs. For instance, it can be argued that Azania preferred to save her work on emails rather than using other technologies because it was easy and worked well for her.

6.4 Conclusion

This chapter has presented the first part of the descriptive analysis, which consisted of two broad themes and seven sub-themes. This descriptive analysis has offered discussions on participants' positive and negative experiences of using digital technologies (hardware and software) in their research. The findings in this chapter were also analysed using the researcher's interpretation and literature to make sense of the findings. Under broad theme one, participants shared their experiences of the usefulness and convenience of digital technologies that led to their positive experiences. These discussions on positive experiences were presented using three Sub-themes. Furthermore, the second broad theme consisted of participants' negative experiences of using digital technologies, which were mainly driven by their socialisation experiences. In-depth discussions relating to participants negative experiences were presented in four sub-themes, in which students referred to their experiences of using Turnitin, Endnote, Grammarly, tape recorder, one-drive and USB flash drive digital technologies. The following chapter extends the descriptive analysis by discussing influences that contributed to master's students' experiences of using digital technologies in research.

CHAPTER SEVEN

DATA PRESENTATION AND ANALYSIS PART TWO

7.1 Introduction

The previous chapter provided the first part of the descriptive analysis. The first part of the analysis presented an interpretation of data from two broad themes: students' positive experiences of using digital technologies in research and students' negative experiences of using digital technologies in research. The present chapter explores three additional broad themes that emerged from the study's findings. These broad themes discuss the influence on master's students' experiences of using digital technologies. These include professionalisation, socialisation, and personalisation influences. Thus, to continue with descriptive data-analysis discussion from theme two in the previous chapter, the present chapter begins with theme three (3) and ends with theme five (5). All three broad themes discussed in this chapter consist of two sub-themes, each revolving around master's students' influences regarding their use of digital technologies. The data used in this chapter was derived from the reflective journals, semi-structured interviews, focus group discussions, and indirect observations. The codes used to represent participants' direct words (verbatim remarks) are similar to those used in Chapter Six. The following table presents the themes and sub-themes discussed in this chapter.

Table 7.1: Presentation of broad themes and sub-themes as emerged in the data findings.

Broad themes	Sub-themes
THEME 3: Professionalisation influence	3.1 Lecturer (supervisor's) assistance
	3.2 Library staff assistance
THEME 4: Socialisation influence	4.1 Family and friends
	4.2 Fellow students, colleagues and peers
THEME 5: Personalisation influence	5.1 Self-guidance
	5.2 Researcher identity: Native vs. immigrant

7.2 Theme 3: Professionalisation influence

This broad theme discusses participants' professionalisation influences that they received from various stakeholders found in their research community. These influences range from supervisors, other lecturers, and library staff to computer-lab managers. The following sub-themes provide a detailed discussion of how these influences impacted participants' experiences of using digital technologies in research.

7.2.1 Sub-theme 3.1: Lecturer (supervisor) assistance

In this sub-theme, participants share how their supervisor or (other) lecturers influenced their use of certain digital technologies. For participants, this influence also spoke to the decision of either employing or not employing digital technology in their study after being informed by these stakeholders, who also play a huge role in their research (especially the supervisor). Therefore, the first three participants in this sub-theme explain their professionalisation influence on using different search engines as guided by their supervisors. The remaining two participants also refer to their supervisors' influence on the use of Endnote in their studies. Referring to his past (undergraduate) and current master's study experience Moosa said:

Before I used digital technologies for research, I had been using them during my speciality in Information System [undergraduate study]. The lecturers used to encourage us to know about recent technologies that are out there so that it could be useful when we teach learners in schools. That is when I say I started to enjoy digital technologies and even for my master's study I still do (IM5).

Moosa added:

Well, for master's, I don't usually seek help from my supervisor regarding the use of digital technologies. ngiyaye ngiye ku (I usually go on) YouTube and post my issue there and I get responses or I use online forums and see other people who have had a similar challenge and how they have addressed it (FM6).

For Moosa, his undergraduate lecturers seemed to have greatly influenced his professionalisation experience of using digital technologies. These lecturers had instilled a sense of joy into using these digital technologies. They taught Moosa to always being aware of new and evolving technologies. This awareness suggests that they treated the use of digital

technology as a process. Sokhulu (2020) argues that, in research, using digital technologies for a professionalisation experience includes accommodating newly introduced technologies. Thus, Moosa learnt to accommodate new digital technologies before he even enrolled in a master's study. Such may be the reason why he gained independence and seldom asked for help from his supervisor regarding the use of digital technologies in research. This value of autonomy prevails in his experience of using YouTube and other channels to seek assistance when having issues with any digital technology (existing or new).

Dudu, Joseph, and Crystal refer to how their supervisors influenced them to use specific search engines to access particular sources useful to their studies. Dudu revealed that she was not aware of Sabinet; however, her supervisor introduced her to the search engine, and she began using it.

In my master's study, I also learnt about other search engine such as Sabinet. Sabinet is where you can find South African journals from South African universities. So, I didn't know about Sabinet during my Honours but I know it now. My supervisor told me about it, that I can find other articles there. You go to our university online page, under libraries you find it there. It is useful because there are articles that you cannot find on Google scholar that are on Sabinet. Especially the South African journals. Google scholar is broad and brings in diverse readings although it is something that is related to what you are searching for but it's rare to find a South African journal. So, on Sabinet you can focus your search on South African university or a certain university you find them there (ID10).

Dudu added:

I was happy to find out about Sabinet because I have always seen students citing articles which I didn't know where they got them from. I saw some of my colleagues having articles that were local, but I didn't know where they took them from. I couldn't find them on Google Scholar or Eric [search engines]. When I was introduced to Sabinet I was like oh... there is this thing now where I can get more articles there. Literature that is local and talking about something that I know and relevant to what I am doing (ID11).

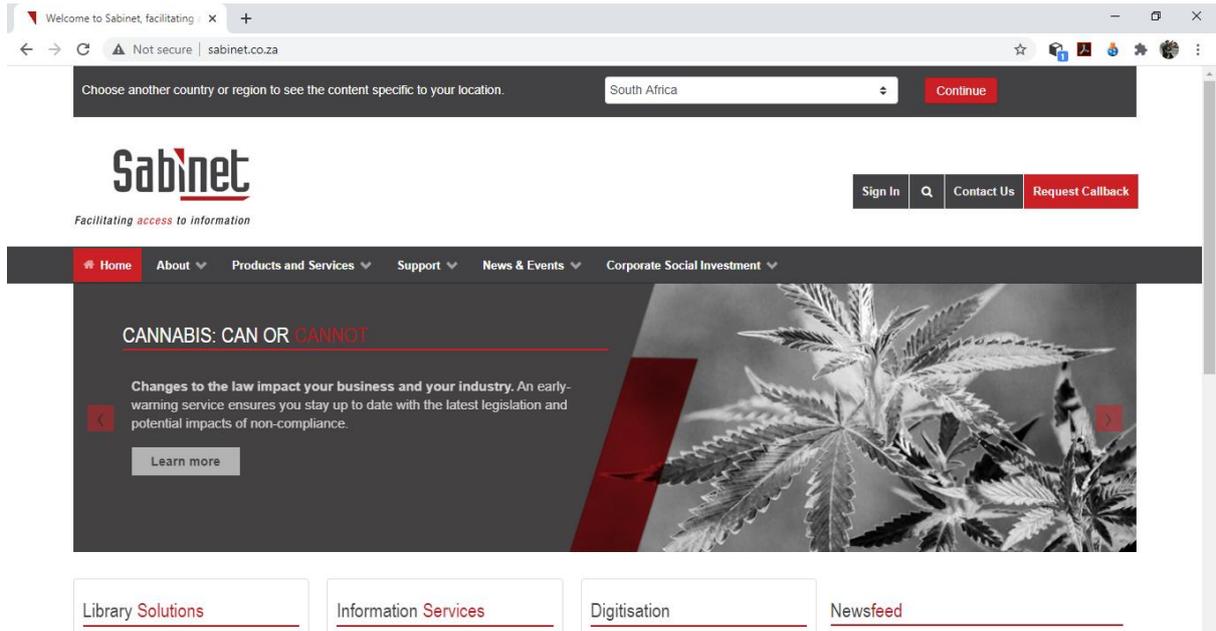


Figure 7.1: Screenshot One of the Sabinet website

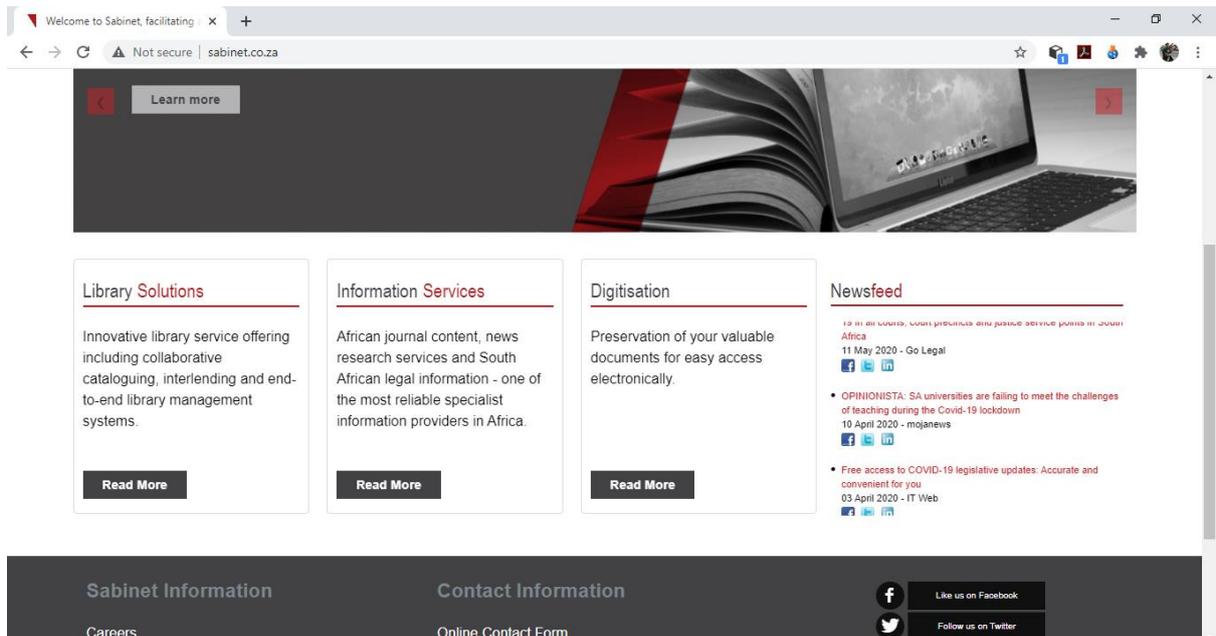


Figure 7.2 : Screenshot Two of the Sabinet website

Crystal shared:

We were advised by our supervisor to use our university website to search for the type of study you are looking for. So, I was searching for quantitative studies as we were

advised to look for the one which we liked. For example, how the person has written it out another which you like the content and another one which pertains to you especially if it is quantitative. She would suggest features that are good for my study. I think she influences me in how I manipulate the digital technologies so that it can work well for me (IC2).

Joseph said:

A supervisor plays role of teaching some things about digital technologies that are good for our research. For example, to tell you to go to the subject librarian because in my undergraduate study I did not know about them [the librarians] and my supervisor introduced me to them and assisted me in how to find articles online. Supervisors have that duty or responsibility to expose us to those digital technologies that are essential for research (FJ4).

For Dudu and Crystal, their supervisors advised them to use specific search engines that enabled them to obtain writing sources (articles and theses) that were thought useful to their studies - Dudu retrieving local South African journal articles, and Crystal accessing theses relevant to her study. The students' supervisors influenced them to use specific search engines that not only helped them in shaping their writing but also in bringing them positive feelings. It can be argued that these positive feelings (Dudu feeling happy) brought joy in writing, as the student may have found useful articles (local) for their study. For Joseph's experience, the supervisor's influence was in the form of a referral, where he introduced him to subject librarians, who further helped with finding articles in relevant search engines.

It was also a similar case for Sinowethu, who shared:

My supervisor also taught me to use the university research space so using Google Scholar and research space has helped me reach this stage of research (IS10). However, it did not end there for Sinowethu, who indicated that, after losing his references stored on a USB, one of his lecturers also taught him about Endnote.

I once heard about Endnote for referencing from peers and I asked one of them how it worked, they tried to show me but I still couldn't understand. Then I went to one of the lecturers who did very well in showing me how it worked going forward. So, I use Endnote for referencing. It was a simple thing, it was just explained by someone who

was not sure but after my lecturer explained to me I was clear in terms of how Endnote works (IS2).

On the contrary, Rose indicated how she was influenced not to use Endnote in a workshop organised by her supervisor. Rose:

I was advised never to use Endnote. I only found out about it now during my master's and I know it helps you with references, for example putting them alphabetically- A-Z. Our supervisor normally hosts workshops for us with students that are doing their doctorates and one of the supervisors there advised us not to use Endnote because it is confusing and frustrating. So, I never want to play with my work, if somebody advises me never to use something I do that no questions asked (laughs) (FR10).

These responses suggest that lecturers can influence students to employ specific digital technologies (software in this case) in their studies. On the one hand, Sinowethu was advised and taught how to use Endnote, thus employing it in his research, especially after losing his references. In addition, the experience of losing a valuable piece of his research could have also contributed to him seeking an alternative, such as using Endnote for referencing. On the other hand, without even learning about Endnote, fear had been instilled into Rose by another lecturer who supposedly had had a negative experience with the software. This fear caused her to refrain from even trying to use Endnote and taking the advice as it was given. Essentially, these professionalisation influences shaped participants' experiences and the way they conducted their studies using specific digital technologies. However, the professionalisation influence did not only end with academics but library staff who also influenced students to use certain digital technologies in research. Such influences are discussed in the following sub-theme.

7.2.2 Sub theme 3.2: Library staff assistance

As briefly discussed above, students' professionalisation influence also stemmed from their encounters with library staff. This sub-theme reveals how master's students' experiences with digital technologies were influenced and shaped by these stakeholders. Akinola, Shawn and Joseph were directed by their supervisors and other lecturers to the librarians for assistance regarding the use of Endnote. For Akinola and Joseph, this happened before they decided to stick to a manual form of referencing. Akinola explained:

Our supervisor also helped us a lot, he referred us to library staff, and we went there and had a class where they taught us about digital technologies. The library staff are the ones responsible for software such as Endnote and other electronic material such as books and articles (IA3).

Akinola further added:

I remember when the library staff had shown Endnote, it started to misbehave when it was giving me initials and surname of the authors instead of just giving me the surname so he told me that where to go to on my laptop, and where to change. I was so happy, I had that relief, you know. (IA4).

In a similar vein Shawn and Joseph shared:

Shawn:

My supervisor said to me, using Endnote for his students is compulsory so I took it like that. Then I learnt using it from him just a few days and then he said I must go to the library to look for an assistant. So, I looked for him and he helped me a lot on Endnote. He taught me how to extract documents from the internet using Endnote. He also taught me how to reference and gave me the document about APA referencing just to go and read. So my skills were then improved from there. So with regards to citing it made things very easy (ISh3).

Joseph:

I was advised to use Endnote by one of the academics at school but I didn't use it. The librarians are the one that made me stop using it because when they were explaining it to us they were not really sure about it. There were a lot of things that they didn't understand about it and they said when we find something new we must come to them and show them. So, I decided that I was good with my traditional way of referencing (FJ10).

Joseph added:

However, if it wasn't for that lecturer or the librarians I wouldn't know about Endnote. It is important that we have sessions where we can be introduced to useful digital technologies and how they can be used to enhance research (IJ7).

Although participants (Akinola, Shawn & Joseph) had a common experience of being taught how to use Endnote by the school librarians, they differed in their acceptance of using the software. For Akinola, even after she claimed she had learnt about Endnote, she still referred to it as *'misbehaving'* when experiencing some challenges with its use. Therefore, Akinola's experience indicates that she had not understood the full use of the software, hence blaming it when these challenges occurred. The challenging experiences with Endnote software may be why students do not continue using Endnote in their studies. Also, Joseph implies that his lack of acceptance of Endnote was owed to the librarian's incompetence to teach him about the software (a professionalisation experience). This implication is evidenced in words such as *'there were a lot of things that they didn't understand'*. Yahya et al. (2012) explain that users only continue to use new digital technology if they believe it will help them accomplish certain activities. Thus, Joseph's comment suggests that his choice of not accepting Endnote was influenced by the library staff member's incompetence, which may have led him to think that the software would not help him reference efficiently in his study. Nonetheless, he still acknowledges both his lecturer and librarian for their contribution in introducing him to Endnote; and giving him that choice to decide its suitability for his study (a personalisation experience). Shawn recognises and praises the assistance offered by the librarian who helped him to understand and accept the use of Endnote in his study. Furthermore, his supervisor's instruction to the compulsory use of Endnote influenced him to use the software; thus, he had to find ways to learn how to use the software effectively in his study.

Azania and Gcinile's encounter with the library staff began during their master's orientation. The librarians introduced themselves to the students and shared their duties and expertise with them. Azania:

When we started with master's the librarian told us about the university online library during orientation (IAz2). When I attended the master's orientation the librarians told us that we can access online resources even at home using library. They took us through the process of retrieving articles through the university library and showed us how to connect to the library at home or off campus. I had received an email inviting me to the orientation (FAz4)

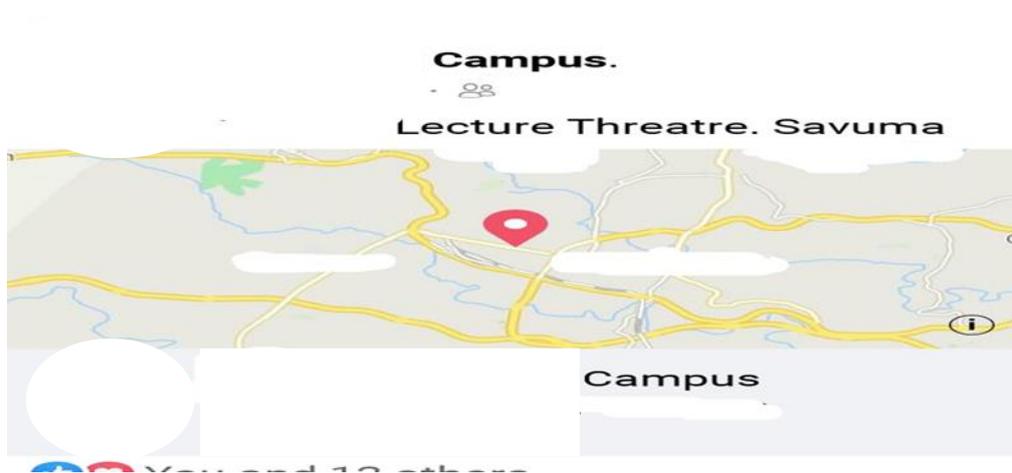


Figure 7.3: Screenshot proving an observation of Azania checking in (on Facebook) at her campus for master's orientation.

Gcinile said:

An email was sent to us as master's students informing us about the venue, time and date for the orientation. The librarians came that day to inform us about the function they perform as librarians but they also said it is not their responsibility at all times to come and inform us about how to go about accessing certain resources online such as journals, theses and articles. So, master's students are held responsible to go to the librarians and seek for help (IG2).

Gcinile continued to say:

So, as advised, I went to librarian unfortunately the system was down so he could not assist me with getting the article then he ended up saying I have to pay for some of the articles and he does not have access to them yet during our master's orientation, we were told that when we go to them we will get help and access to articles yet when I was there, the person denied that they have access to those journal articles which we have to pay for (IG5).

When the other participants were asked whether they attended the master's orientation, they indicated:

Joseph:

I did not go [to the master's orientation] because I was still at home. Still, I got what I needed and with prior experience of my Honours study I still know how to access the online library and I know you can still go to the subject librarian for whenever I need help (FJ2).

Moosa shared:

I did get an email inviting me to the master's orientation but because I was working that day I could not attend it. I didn't have much knowledge about the university online library until I had a workshop with the library assistance on how to access library sources such as articles. So, I got that information along the way not during master's orientation (FM5).

Dudu added:

I also didn't attend the master's orientation and I didn't know about it too (FD4).... I have never went to the library mina, I didn't know that there were people that can assist us so it's my first time hearing about this. I will go there next time I need help about the use of digital technologies (FD8).

These experiences suggest that master's students do receive some form of training that prepares them for the use of online search engines for them to begin writing their dissertations. This training may be received in the beginning, such as master's orientation day (s) (for example, with Azania and Gcinile), or later, when students themselves go to the librarians to seek help (Joseph and Moosa). Moreover, it seems that students are introduced to relevant search engines professionally, thereby finding academic sources for their studies (through library assistance). In addition, participants' experiences also emphasise the importance of being part of the master's orientation. Dudu did not attend orientation, resulting in her not being aware of the help the librarians could offer to her; thus, she mostly relied on her supervisor for help with digital technologies. From Gcinile's experience, it is regrettable to see her not receiving the assistance she was promised during orientation when the librarians could not provide her with access to an article she needed to use for her study. Joseph also attested to a shortfall experience with the library staff in that insufficient training or guidance was provided on the use of Endnote in research.

7.3 Theme 4: Socialisation Influence

Socialisation influence attests to the social needs of the students concerning the use of digital technologies in research. On this theme, they share their experiences of specific stakeholders in their social community, helping in shaping their use of digital technologies in research. The participants also expressed how some of their friends, family, peers, and colleagues prepared or helped them with the use of digital technologies, with the help mainly leading to positive experiences.

7.3.1 Sub-theme 4.1: Family and friends

Hsieh (2011) discusses that the socialisation influence affects how people use digital technologies based on perceptions of their friends, family, colleagues, and peers. Similarly, in this study, some participants said that their family members and friends contributed to their experiences of using digital technologies. Thus, some could apply what they learnt from them in their research studies. Others attested to having their family members prepare them for the use of digital technologies in the early stages of their lives. In contrast, others had to learn more about digital technologies in order to teach some of their family members. A few participants also spoke about their friends' influence in using specific digital technologies in research. Referring to her family influence in using digital technologies, Rose said:

For me, when I was growing up in primary school my aunt gave me a desktop. So, I started working on it by playing games. After that I started learning how to type. I found out about Word document whereby you type and you save and as I engaged more with it, I learned how to send emails and everything. At first it was on my own but then I had an older brother who I used to inquire from so he did help me a lot also (IR2).

Thabo shared:

I had a sister who was already enrolled into the university system so she taught me how university works and the importance of checking emails. However, she did not tell me that this is how emails operate. She just showed me how to access my emails and now I am able to communicate formally with my supervisor through emails and it is more of a directive communication (IT2).

For Joseph, he had to know more about digital technologies because he used that knowledge to teach his younger siblings about them. This encouraged him to seek more information on digital technologies, which also influenced his use of digital technologies in research. Joseph:

With my brother, we usually play around digital technologies because I have little brothers and sisters, so I would try to help them with use of digital technologies. Now in order to be able to help them, I need to know more about digital technologies so that I can teach them how they function. So, understanding digital technologies for me grows every day because I try and I engage with digital technologies every day also. I try to know and work around them so that I can manipulate it and see how I can use it in my study too. There is that eagerness to wanting to know more about how I will use it. For example, if you are using PowerPoint slides, there are different features so I try to work with them and see how one is different from the other and how long it takes to open and close it and stuff. Not everyone wants you to use the ones that take a lot of time when depicting a picture especially the lecturers, so it helps a lot to try and work around them and see which one works best for you (IJ3).

In the above extracts, participants indicate how their families moulded their experiences of using digital technologies. This influence came in the form of a socialisation experience; these participants were learning informally from their family members, or on their own. For instance, Joseph associated his family influence with finding out more about digital technologies to expand his understanding of them so that he could teach his younger siblings. This particular experience indirectly influenced him to understand digital technologies that he used in his research too. Therefore, the value of taking responsibility appears to be prominent in Joseph's socialisation experience. Rose seems to have been socialised around digital technologies in the early stages of her life, to the extent that using them for research was not a new encounter for her. In other words, her socialisation experience (with her family) somewhat prepared her for the use of digital technologies in her master's study. Similarly, Thabo's sister helped introduce him to the university digitalised system, which included the use of emails.

Other participants linked their socialisation influences to the assistance they received from their friends on the use of digital technologies. In this regard, participants shared their experiences

of helping each other as friends and being introduced to valuable software. Such help from friends aided significantly in their research studies. Akinola revealed:

We help each other with my friend. For example, with the aspects that I don't understand well or didn't understand at all, she would help me. Also, with Endnote which I once used for my master's study, some of the aspect of Endnote she helped and I was able to help her as well (IA2).

In the same vein Jessie explained:

Most of the time I am always with my friend and I ask her, she happens to know a lot about digital technologies. Our supervisor always tells us that he is not good with digital technologies, he prefers the paper methods. Better yet, I go to the library and ask because I have worked there so I am familiar with everyone around there. I remember this one time, I was instructed to use Endnote and I had no idea what it was and so I had to go to the subject librarian who helped me a lot but I when I forgot how to use it, I asked my friend and she helped me (FJe6).

Shawn said:

I learnt a lot in my second year of my postgraduate study. Just to type quickly and do other things that were not taught during my undergraduate study. I was writing my literature review at the time. Not that I did not know everything but there were some keys that I was shown by one of my professional friends whom I work with on the research study (ISh3).

From the above excerpts, it is evident that the assistance the participants received from their friends was useful in their studies. For example, Akinola expanded her knowledge and skills on Endnote software; Shawn was exposed to various key functions on the keyboard, learning to type quickly. It appears that Jessie took a holistic approach to the assistance she obtained regarding the use of digital technologies. She did not only depend on her friend for guidance but also made an effort to seek assistance from other stakeholders (such as the school librarian). Jessie's personalisation experience drew from the strength of socialisation (friend's assistance) and professionalisation experience (assistance from the librarian).

Joseph and Nkosi also spoke about their socialisation influence, friends advising them on the use of Grammarly and Google Scholar, respectively. Joseph:

A friend who was doing their fourth year of undergraduate study introduced me to Grammarly. I also kept seeing the adverts of Grammarly on YouTube and when I asked them who has Grammarly, he said he did and helped me install it on my computer. I found it to be useful because, I have not yet mastered grammar and it helps a lot in that aspects because it corrects the silly mistakes that you make but one has to be conscious that it corrects you and sometimes end up saying what you did not intend to say (IJ7).

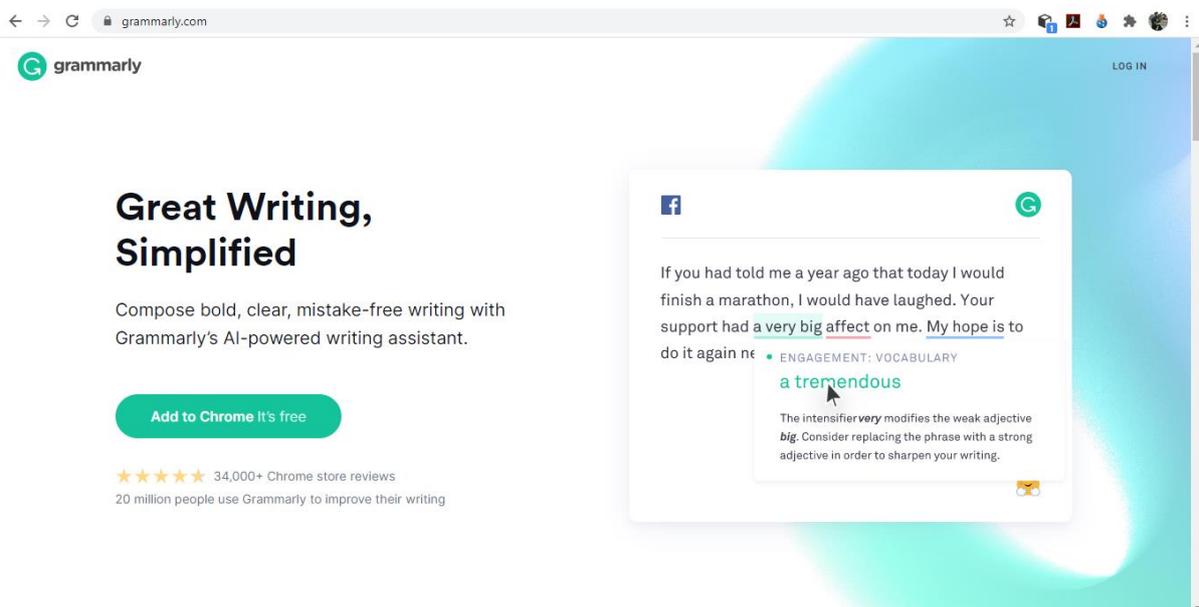


Figure 7.4: Snapshot of the Grammarly software website from which students can download the software

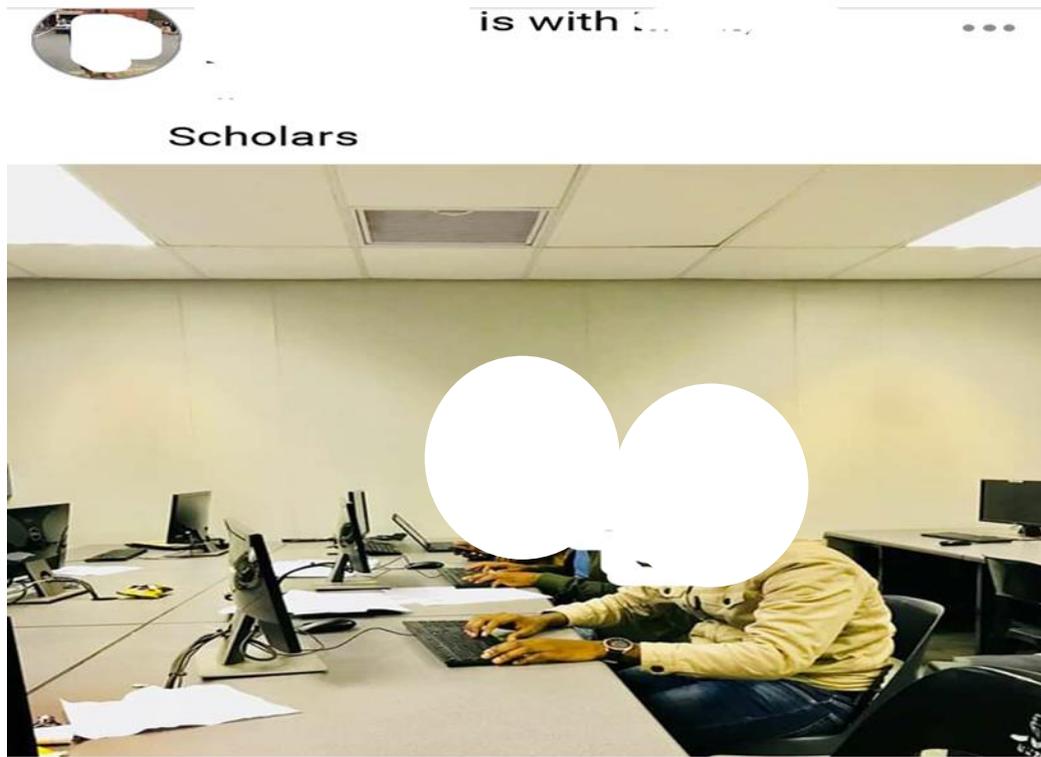


Figure 7.5: Facebook screenshot observation of Joseph and his friends at the computer laboratory

Figure 7.5 above reveals Joseph's socialisation influence, all entering the computer lab together to work. This collaborative effort suggests that, when they work together, they can assist one another wherever needed. This figure indicates that Joseph also uses his social media accounts to post about research. He titled the post "scholars", which suggests that they engaged in research-related activities at the computer lab.

Alluding to his experience with Google scholar, Nkosi explained:

oh my God! Google Scholar is invaluable. One of my friends just told me about one of the scholars that I need to follow. Two people actually [mentions them]. Both of them write on sexuality and rurality and Africa in terms sexuality and gender. So, I have started following them on Google scholar and every time I discover their articles I am like where have these two people been in my entire life. I have access to every single article they have written (most of the articles). I might not necessarily have the actual documents but I have the titles of their articles, the title leads you to knowing

what type of content to expect within the article. These two people have been very important for my master's theoretically (IN5).

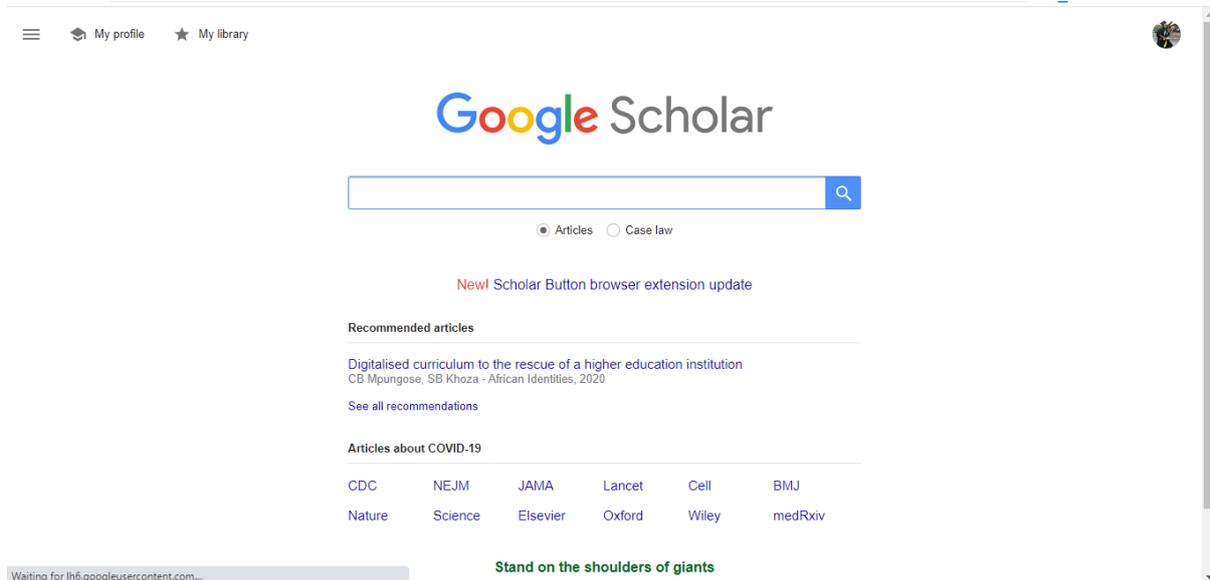


Figure 7.6: Observation of Google Scholar search engine (main page)

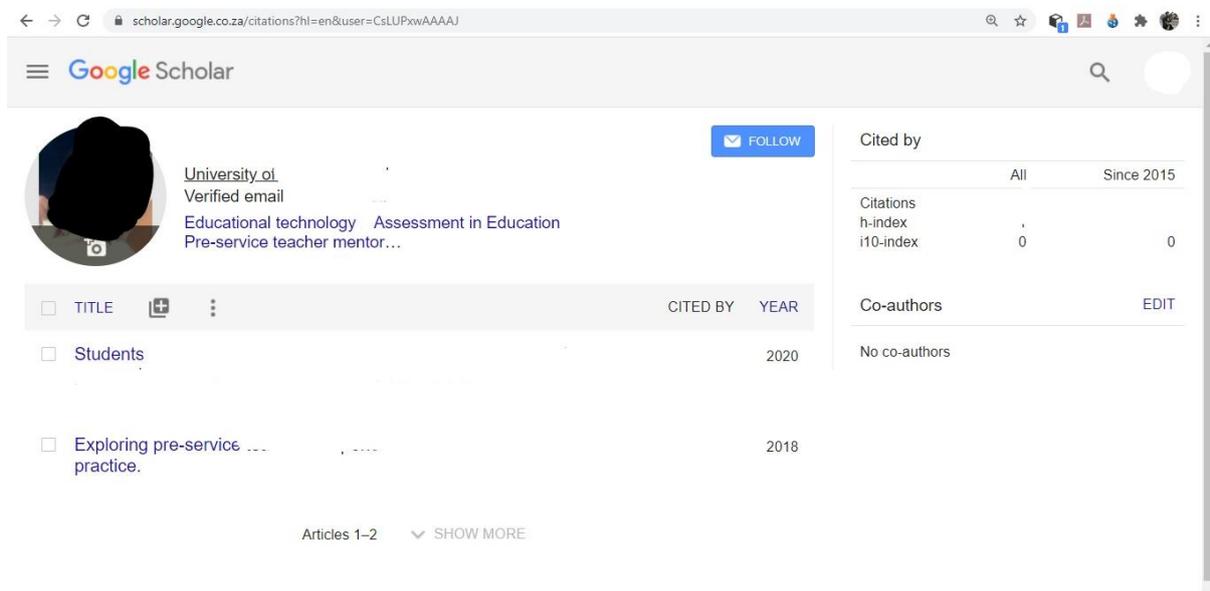


Figure 7.7: Google Scholar observation on which users can follow researchers, gaining access to their articles (publications)

Joseph's socialisation influence did not end with his family members but also included his friends, one of whom introduced him to Grammarly software. Joseph found the software useful to his study. Being associated with his friend helped him gain a new digital technology that he could use to attend to his grammar needs. Nkosi had already been using Google Scholar. However, the socialisation with his friend led to teaching him about other features of which he was not aware. These features that he learnt from his friend further became useful to his writing. Using words such as "*I found it to be useful*" (Joseph) and "*Google scholar is invaluable*" (Nkosi) reflects the positive impact of the socialisation experience and digital technologies on their studies, as influenced by their friends.

7.3.2 Sub-theme 4.2 : Fellow students, colleagues and peers

In this sub-theme, participants share their experiences on socialisation influences with their peers and fellow students and their effects on how they used specific digital technologies in research. These influences came in the form of advice, recommendations, and guiding one another as students on the use of specific digital technologies. Alluding to her experience, Dudu explained:

I have asked for help but what I have discovered is that we are in the same boat with the other students. There are things that we don't know. Sometimes we take the long route of using things maybe the keyboard. Something you just need to press the button and then it's done without taking the long route. There were other students however, whom we shared articles with on WhatsApp and they also introduced me to applications that I did not have on my phone, they said I need to go to App store to download them so that I can be able to read articles properly and also be able to answer questionnaires (ID3).

Dudu added:

So, sometimes I would read the articles on my phone using Adobe reader, usually the short articles that are 8 pages. I also installed Microsoft Word so sometimes I would read my articles using my phone (ID7).

Gcinile also referred to her experience where she received advice from another student about the use of Endnote in research. Gcinile:

One of the students last year went to the ICS staff for help regarding Endnote and they demotivated the student from using the software so she felt like she wasted her energy going to the ICS staff. She then told us that there is no need to go there also let us just use the manual ways of referencing (FG11).

The above experiences suggest that both Dudu and Gcinile received some form of influence from their fellow students in one way or the other. On the one hand, Dudu observed that other master's students like herself had limited skills in using certain digital technologies. Instead of using keyboard shortcuts in a computer, they only knew longer ways of working. Nonetheless, some students helped her by recommending specific application software that she could later use on her cell phone, enabling her to read articles. On the other hand, Gcinile was advised not to use Endnote by another student who was discouraged from using the same software by ICS staff. This discouragement is negative. Gcinile did not take the opportunity of experiencing Endnote first-hand, which might have worked well for her study. In other words, Gcinile's acceptance of the other student's advice deprived her of experiencing the use of Endnote on her own to decide its suitability for her study. Also, from Gcinile's experience, it is evident that the discouragement on using Endnote had become a pattern, moving from one stakeholder to another, indicating the power of social influence in one's research.

On the contrary, Moosa commented on a prior experience that came from other students influences. Moosa:

There was this guy I was in class with during my undergraduate study, before coming to university he had done some computer course. So, he was so fluent with the use of computer, he could break a computer and put it together again. That is where I started being influenced by him regarding the use of a computer. The notion of going beyond what you are learning and finding out more. Ukhona omunye owayengaphambili kwami ngokufunda (there is another guy who was a senior student) and he taught me windows and he was the first person to teach me about the operation systems of a computer. He used to install and upgrade my windows on my computer. When he was fixing other people's computers he would show me how to go about doing it because I didn't have an understanding of what was a drive or USB. For example the shortcuts on the computer, I learnt from them. Copying, cutting or what to do when the computer freezes. All of these things are working for me now during my master's study (IM6).

Moosa's articulations suggest that he was happy with the influence he received from his fellow students, who exposed him to various features of a computer and Microsoft Word documents. From his comment, through this socialisation experience, Moosa became eager to know more about digital technologies because he kept learning so much from his peers. Al-Qeisi (2009) argues that, regarding the use of new digital technology, the socialisation influence usually has a great effect on female users. However, this study offers interesting findings where it was revealed that the socialisation influence had a significant impact on both male and female users. This socialisation influence is seen in Gcinile's (female) acceptance of not using Endnote after being advised by another student; and Moosa's (male) following other students' guidance on the use of a computer and software (such as Microsoft Word).

Thabo shared that he still faced challenges using digital technologies due to not attending computer literacy in his previous undergraduate study. He additionally attested to relying on his peers for help when he needed assistance with digital technologies. Thabo revealed:

I still struggle with some of the things because I didn't do computer literacy. Nonetheless, when I do struggle I always have people ahead of me whom I can always ask for help. It is just people who are ahead of me. For example I am doing my master's so I can ask someone who is doing their PhD or ask a peer who has gone through that experience (IT4).

Thabo further added:

Professional training is not for me and that is why I didn't attend computer literacy. I prefer learning in a social way because there is no pressure that is being put to you and you just learn from your peers. It is easier to learn from your peers because they can repeat for if you don't understand until you get it right. You can also stop them to try out their teaching but with professional training it is not you alone, there is the rest of the class and only one professional. So now you can't be raising up your hand and say you didn't understand while others are understanding. Why are you the only one getting lost, why you want to re-do something when others are progressing and getting it correct the first time. Sometimes it is also very embarrassing to tell the entire class that you are not understanding. With your peer it is easy because you choose a person that you are more comfortable with (IT9).

Thabo indicates that he depends on his peers in order to understand how to use digital technologies in his study. This high dependence on social learning seems to come from the need to learn from people he is comfortable with (his peers). His reliance on socialisation influences for learning, to the neglect of professionalisation causes an imbalance in his experience of digital technologies. Studies conducted by Biesta (2015) and Khoza (2018) found that people usually focus on one side of learning of the two (socialisation and professionalisation), which causes challenges with balancing the two experiences to inform individual needs. It has been a similar case with Thabo, resulting in him struggling with using digital technologies even at master's level. Thabo even admits this by saying "*I still struggle with some of the things because I didn't do computer literacy*" (a professional training for the use of digital technologies).

7.4 Theme 5: Personalisation Influence

This theme reflects on participants' personal identities and efforts in using digital technologies. The discussion mainly focuses on participants' self-guidance, and how they identify themselves when using digital technologies (whether digital immigrant, or native). This identity further influenced their personal experiences of using digital technologies in research. Three sub-themes emerged under this broad theme and are discussed in detail below.

7.4.1 Sub-theme 5.1: Self-guidance

From the experiences of participants in this study, self-guidance seemed to be one of the prominent practices that some participants relied on when they were working on their studies on their own without any guidance from peers, friends or any professional stakeholder. In other words, self-guidance was a form of a personal influence that also contributed to their personalisation experience with socialisation and professionalisation influences that also shaped such. Azania asserted:

As I progress with my study I teach myself, no one helped me besides those times I mentioned before [library staff assistance]. It is just practice, you have to practice. When you get the time you have to practice so that you can familiarise yourself with digital technologies because the digital technologies are difficult to use but when you keep on practising you familiarise yourself with them (IAz2).

Azania added:

For example, you don't have anyone to teach you how to use emails because it is there on your phone and laptop, you just need to follow instructions. You just have to read the instructions and icons indicated to you. For example, 'compose email' you then write a new email. You don't need anyone to teach you that (IAz4).

Dudu similarly expressed having learnt the use of some digital technologies on her own. Dudu:

Everything was self-taught. Likewise, in research there is no part where you learn about the use of digital technologies in research. Everything is self-taught, even with the use of Turnitin, I didn't know how it worked. Angikhumbuli (I do not remember) attending any training for it, sasitshelwa nje ukuthi (we were told that) you need to use it for our assignments and research (FD3).

Azania and Dudu noted that there are digital technologies that you can learn to use on your own. Thus, learning on their own also indicates that their personal influence was driven by informal learning. This is because there is no formal guidance provided on how to use these digital technologies. However, For Dudu, her dependence on self-guidance was influenced by her not knowing that there were stakeholders such as librarians that could assist with using digital technologies in research (as discussed earlier in Sub-theme 3.2). As a result of this unawareness, Dudu depended on self-guidance to understand digital technologies in her study. In addition, Dudu did not attend orientation day, which could have exposed her to the various stakeholders that could help her using digital technologies in research. Azania, by contrast, attended the orientation day; hence, she knew that she could go to the school librarian for assistance whenever she needed to.

Three other participants referred to their experiences in which they also guided themselves on using cloud storage service or one-drive. Nkosi explained:

I introduced myself to cloud storing. The university had been advertising that they now have cloud storage. Well... I have Google Drive which I had been using since my Honours study and now I've stopped using it because of limited space. I use the One Drive offered by the university because it is one terabyte big for each person, even now it is not full (IN7).

Moosa also shared:

I followed the instruction on Microsoft [on how to save on cloud] and I signed up. Ngabona ukuthi iyasebenza (I saw that it works) when I locked my computer ngaphakathi (inside the house) and I wanted to access stuff and I went to the computer LAN and I was able to access everything that I had saved there. So, I would say ngazifundela (I learnt on my own) because even my supervisor akawazi One Drive (even my supervisor does not know about One Drive). It is very useful and I always recommend it to people because with your hardware kungenzeka inoma yini (anything can happen) and you can't start from scratch so this thing is very important (IM6).

Both Nkosi and Moosa's experiences suggest that they guided themselves throughout the process of discovering, signing up, and using cloud-storing services. The value of being self-driven seemed to arise again within participants' experiences; they took the initiative of storing their work on cloud services. It seemed a useful practice for them to store their work securely on cloud. In addition, Moosa's comment reveals that he used a trial-and-error method to access his documents, even when he was away from his computer, trusting in cloud services. To his benefit, he could access his work anywhere; thus he began to trust this system more than saving documents in hard-drive storage.

Moreover, participants also expressed their feelings when they engaged with digital technologies during their studies (research). Thus, participants highlighted feeling eager and wanting to learn more about digital technologies that later benefited their studies. Arguably, participants' eagerness to learn aided in their effective use of these digital technologies. Digital technologies frequently evolve in the shift towards the 4IR. For the participants, this eagerness resulted in a positive personalisation experience with digital technologies in research. Commenting on her eagerness to learn and how it has impacted her study, Nthabi said:

It was easy for me to use digital technologies in research because I was eager to learn and also I realised how much it makes life easy (RNt3).

On this eagerness, Nthabi, in an interview session, said:

You know, I am one person who is always learning, let's take cell phones for example, they make things easy because I don't have to use the laptop every day. Sometimes when it is lunch time at work I use my phone to search for articles I need for my study.

So, one thing leads to another, I would get new information and new ways of accessing articles through using my cell phone (INt4).

On a similar note, Moosa also shared:

I am an active participant of digital technology because I'm one of those people who are very interested in digital technologies. Even the new ones, I'm always interested in them. I want to discover new technologies and new ways of doing things and that is how I discovered Academia.edu, I started using Google Scholar first but then I also discovered Academia.edu through actively engaging with technology. (IM11).

Joseph asserted:

I am a very curious person especially when it comes to digital technologies so I try to work around things, even with cell phones. Angifuni ukhululwa yinto (I don't want to fail at doing something). Even when I am not necessarily engaging in my study activities I try to look into the computer and what it has to offer. I simply try to experience them so that when I use those features next time, it will be easier for me to do so. I am aware of the thing and how they function (IJ5).

The above responses indicate that taking an interest in using digital technologies has worked to the participants' advantage. All three participants (Nthabi, Moosa and Joseph) attest to how their eagerness around digital technologies has helped them progress in their studies. For example, Nthabi shared that, by constantly engaging with her phone, she discovered new ways of finding articles relevant to her study. A similar experience occurred for Moosa- he was also able to discover new platforms to search for articles. Additionally, Joseph's response suggests that he was eager to learn on his own and discover new digital ways that would also benefit his study. Such a response implies that he took the responsibility to teach himself about digital technologies (out of curiosity). Therefore, one can argue that these three participants understood that digital technologies are not static but a developmental process whereby there are always new ways of working. This awareness further added the value of responsibility, eagerness and discovery in their personalisation experience of using digital technologies in research, guiding themselves throughout the process of learning. This self-guidance further revealed participants' personal influences in using digital technologies which were intrinsically motivated.

7.4.2 Sub-theme 5.2: Researcher identity: Digital native vs. immigrant

Researcher identities have to do with how master's students identified themselves in the process of using digital technologies in research. Thus, to inform digital technology user identities, Prensky (2001) derived two concepts to categorise users' (in this case master's students) ability to use digital technologies by referring to their generational segregation. These concepts include the terms digital immigrant and digital native which are used to describe users born before and during the digital age (Prensky, 2001). Interestingly, in this study, some of the participants were already familiar with the concepts but described them differently and uniquely according to their personalised experiences of using digital technologies in research. For instance, when referring to digital native as well as positioning her identity in using digital technologies, Gcinile said:

A digital native is somebody that has been exposed to digital technologies when they grow up. For instance, a 5-or 6-year child having a smart phone. You know when you have a smart phone it's even easy to use a computer or a laptop because its starts with a smart phone. When you are talking about digital natives again you are also talking about those kids that go to rich schools at primary school level and are exposed to computers at an early age. For me, even at high school level I did not have access to digital technologies most of the time. It is only in 2012 when I was doing my first year B.Ed. degree where I was introduced to computer literacy module. So, I am not a digital native, I experienced a number of difficulties when I started using a computer. So, with regards to my background, I had no access to computers and smart phones (IG3).

Gcinile further commented:

Digital natives are different researchers than the rest of us because they were exposed much more to digital technologies. So, whatever they do as digital natives it takes some time for a digital immigrant to adapt to such changes within the use of technologies. Digital immigrants require so much time to do an activity using digital technologies which digital natives may find it easy to do in a short period of time. So, I guess I was a digital immigrant before but since I am now exposed to digital technologies more, I am sort of a digital native but I am not (laughs) (FG5).

Palfrey and Gasser (2011) explain that digital natives are users who were born after 1982 when digital technologies were commonly used and greatly accessible to people. Prensky (2001) adds

that users who are digital natives are experts and usually enjoy using digital technologies. For Gcinile, her experience and age profile (26-30) indicates that she was also born during the digital age; however, she was not exposed to digital technologies in the early stages of her life; hence when she started to use them later in her university life, she did not seem to enjoy the initial process. In that she mentions her struggles with using digital technologies during her previous undergraduate studies. Gcinile does not self-identify as a digital native, despite previous studies positioning her to be one. Gcinile also appears to associate digital nativity with socio-economic status, such as class, in commenting, “*When you are talking about digital natives again you are also talking about those kids that go to rich schools at primary school level and are exposed to computers at an early age*”. Juxtaposed with Prensky’s (2001) definition, which focuses on generational gaps, Gcinile views digital natives as people who are afforded exposure to digital technologies in the early stages of their lives.

Additionally, Gcinile, in her second response, further implies that it is possible to transition from one identity to another after undergoing a series of learning or exposure to digital technologies. Gcinile talks about her identity shift from a digital immigrant to a digital native after much exposure to digital technologies during her master’s study. Khoza and Manik (2015) referred to this new identity as a digital refugee where users who were once not exposed to digital technologies learn and adapt to using the technologies in their research studies. For example, in the same study conducted by Khoza and Manik (2015), master’s students gained the digital refugee identities by migrating to using digital technologies for their research activities after previously having little experience with them.

Referring to the digital immigrant identity, Dudu explained:

I see myself as a digital immigrant because I feel there is a lot that I still need to learn. I can feel that I don’t have enough knowledge when it comes to digital technologies. I still need to learn. Even with Skype, I did use it once but I think I have forgotten exactly what did I do. I feel the information that I have is scanty. For example during my mock defense I couldn’t use a pointer to point at my presentation, I was still doing it manually. Imagine in the 4IR I cannot use a pointer!! I feel I am not that exposed to digital technologies right now. I am not familiar with it. I don’t know ukuthi kusele kuphi (I don’t know what is missing) but what I have noticed is that we are struggling

to use a simple programme such as a PowerPoint. Furthermore, I think I play a role of an immigrant particularly in Microsoft ,PowerPoints and other software that are used in research due to the fact that I don't have sufficient knowledge on how to use it efficiently (RD11/12).

Dudu added:

So, I think maybe age is a contributing factor too, because if I think of myself ten years back I don't think digital technologies would be a problem (ID13).

From the above excerpts, it is evident that Dudu identifies herself as a digital immigrant because of her lack of experience with digital technologies and because of her age (36-40). Prensky (2001) discusses that digital immigrants are users who were born before the digital era. Considering Dudu's comment about age in relation to using digital technologies, it can be argued that her understanding of digital immigrancy is aligned with Prensky's (2001). Dudu is also very specific in which digital resource she maintained the digital immigrant identity. Therefore, this implies that there are digital technologies that she could use more efficiently than others. Wang, Myers, and Sundaram (2012) refer to this as digital fluency, in which the efficacy of using digital technology differs from one activity to another, depending on the resource used. This digital fluency is affected by factors such as age, gender, education, and socialisation. Thus, one can argue that Dudu had minimal digital fluency in Microsoft software, as shaped by her digital immigrant identity.

Nonetheless, in a focus group discussion two participants (Rose and Crystal) positioned themselves in between two identities of digital immigrant and digital native. Rose:

For me, I would say I am in between, I am neither a digital native nor immigrant because each day I learn something new. Like today I am using Zoom, so I do have that little knowledge (FR5).

Crystal:

I am in agreement with that because every day you learn something new. You use a digital technology today and think you've got this but you can always learn something about it that could add on top of that. There are many ways to play around the

software and use it so I am learning every day. Therefore I am also neither of digital native or immigrant because I still have a lot to learn (FC5).

It was interesting to note that, even though both Rose and Crystal grew up using digital technologies from early stages of their lives, thus being more familiar with digital technologies such as computers, cell phones (hardware), Microsoft and emails (software), they still did not consider themselves digital natives. Rose and Crystal position themselves in the middle, between the identities of digital natives and digital immigrants. These findings suggest that Rose and Crystal do not align themselves with any of the two dichotomous identities. Instead, they see themselves as individuals who can continually grow in knowledge and skills of using digital technologies. Even though they were born in an era that positioned them digital natives (age 26-30), their responses contradict the findings from studies Bennett et al. (2008), Palfrey and Gasser (2011), and Prensky (2001), which position users digital nativity according to their age and exposure to digital technologies. In essence, researcher identity seems to have contributed to the ways in which some participants experienced digital technologies. For example, Dudu attested to struggling to use PowerPoint because of her digital immigrant identity.

7.5 Conclusion

This chapter formed part two of data analysis, by presenting and discussing three broad themes based on participants' professionalisation, socialisation, and personalisation influences. Each broad theme consisted of two sub-themes that provided further detail and analysis of participants experiences. Literature was used to provide further insights into the data findings used in this chapter. The findings from the third theme (professionalisation influence) indicated that supervisors and other lecturers, such as professional stakeholders in research have great influence in exposing students to specific digital technologies (software) that they can use in their studies. In addition, library staff (subject librarians) were also available to assist students in using digital technologies. However, the students needed to be aware of their services, in order to be afforded such assistance. In other words, librarians only influenced how students used digital technologies when students consulted with them. For some, this consultation left them discouraged, while others were equipped to continue using specific software. For theme four (socialisation influence), it was revealed that participants' social community, such as friends, family, colleagues and peers, positively impacted their use of digital technologies.

Some of these stakeholders helped them with using specific software in times of need. Others helped them prepare for the use of digital technologies at later stages in their lives, such as using them for studies. The chapter concluded by providing an analysis of findings for theme five (personalisation influences) which indicated that, apart from socialisation and professionalisation influences that contribute to participants' experiences, personal influences help them cope with using various (new or existing) digital technologies in research. Such personal influences involved having the drive to teach themselves and eagerness to learn how to use specific digital technologies. For others, their self-identity (researcher) propelled them to want to know more about digital technologies: they were aware of what they were either lacking or good at. The next chapter negotiates the study findings in relation to the analytical framework proposed in Chapter Four of this study. Such will further provide five propositions that can help master's students use digital technologies effectively in research, to attain quality personalisation experience.

CHAPTER EIGHT

THEORISING FINDINGS, PROPOSITIONS AND CONCLUSION

8.1 Introduction

This study was conducted to explore master's students' experiences of using digital technologies in research. Therefore, a case study methodology using reflective journals, semi-structured interviews, focus group discussions and observation were used to generate data that were analysed in the last two chapters. The previous Chapter (Seven) thus, provided detailed discussions on three broad themes, namely: professionalisation influence, socialisation influence, and personalisation influence. Such contributed towards master's students' experiences of using digital technologies in research. The present chapter focuses on presenting and theorising the study's findings through five propositions, which I argue to have provided quality personalisation experiences when participants used digital technologies in their research (philosophical analysis). These propositions are generated from the study as contributions towards finding solutions addressing the tensions between socialisation and professionalisation to form new personalisation experience that attend to individual research needs. The Persona-Tech analytical framework discussed in Chapter Four of this study indicates the new identities that may form due to the unique experiences with digital technologies, driven by a researcher's study needs. Figure 8.1 below presents the Persona-Tech analytical framework generated and tested in this study through interacting with participants' experiences.

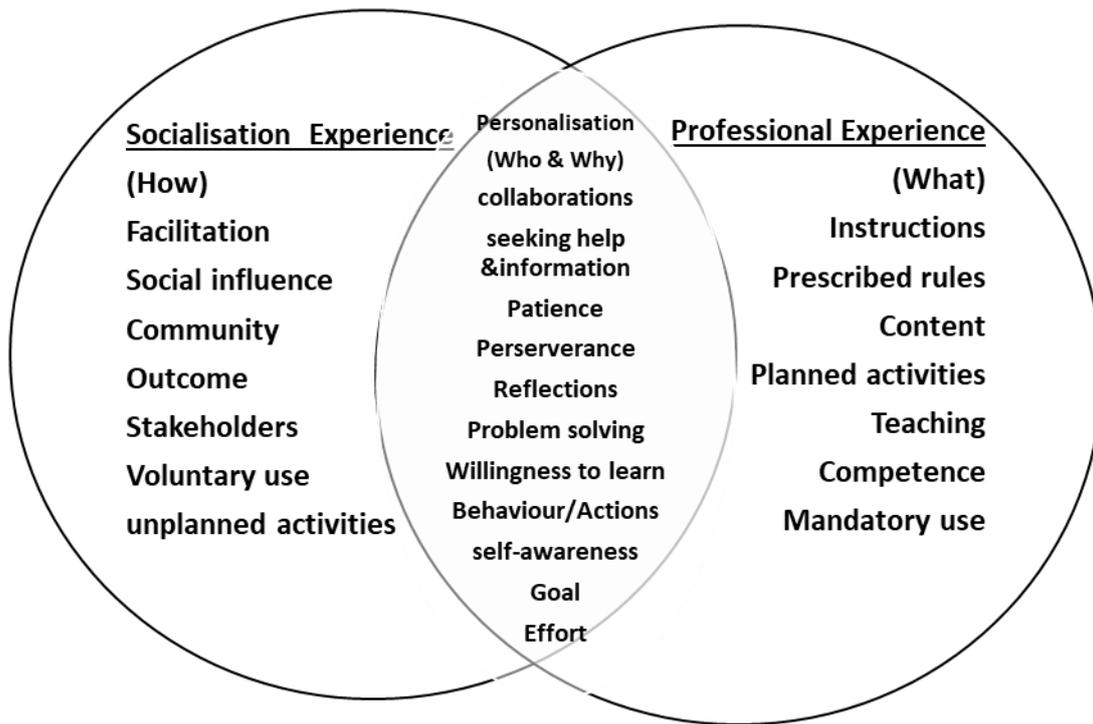


Figure 8.1: Persona-Tech analytical framework proposed in Chapter Four of this study

Chapters Two and Three of this study present detailed literature findings on using digital technologies for socialisation, professionalisation and personalisation experiences. However, it was noted through literature that there is a major focus on exploring the use of digital technologies for socialisation and professionalisation experience, neglecting the personalisation experience that is informed by individual needs. As a result of this gap, this study argued for the use of digital technologies for the personalisation experience, drawing from the strengths of socialisation and professionalisation experiences. For this reason, the study proposed the Persona-Tech analytical framework that negotiates how researchers (in this case master's students) can combine their socialisation and professionalisation experiences of using digital technologies. Such integration will develop a quality personalisation experience that addresses their individual research needs. A quality personalisation experience thus, refers to master's students' optimal experience with digital technologies. Such enables them to use these digital technologies effectively in their studies. In each unique personalisation experience, students formed new identities (drawing from different values) that enabled them to achieve this quality experience in using digital technologies for research. Thus, based on the

study findings, I argue that in order for master's students to achieve a quality personalisation experience, also known as the 4IR self-actualisation experience of the new normal (Khoza, 2020), they may employ the following values: reflection, forming collaborations, patience, seeking guidance, support and information, and self-awareness which I proposed in the Persona-Tech analytical framework.

Moreover, this final chapter of the study also provides a holistic summary of the research, by reflecting on the key questions concerning the study's findings. The study sought to answer the following questions: 1. What are master's students' experiences of using digital technologies? (descriptive=professionalisation experiences); 2. How do master's students apply their experiences of using digital technologies in research? (operational = socialisation experiences); 3. Why do master's students experience digital technologies in particular ways? (philosophical/theoretical=personalisation experiences). To finalise the chapter, I draw significant implications of the study to establish an impact and inform digital technology practices in higher education. In other words, concluding remarks and relevant implications are provided to guide the use of digital technologies in research.

8.2 Theorising master's students' experiences using the Persona-Tech analytical framework to inform quality personalisation experience

8.2.1 Proposition One: Reflection

As part of the first proposition to introduce a quality personalisation experience in using new and existing digital technologies in research, this study found it essential for master's students to reflect on their prior learning and experience with digital technologies. For participants to achieve quality personalisation experience, they needed to reflect on their past social, professional, and personal use of digital technologies. This reflection meant that they had to self-introspect on how they have used digital technologies successfully in the past to utilise that prior learning or experience to augment their digital skills and understanding. Therefore, in this study, reflections helped master's students become aware of their abilities and identities when employing certain digital technologies in their research studies. Van Manen (1995) asserts that reflecting has to do with looking into past and present actions to shape future experiences. Similarly, Mabuza (2018) discusses that reflection involves critically inspecting one's practices

to learn from past experiences and improve in the present and the future. Thus, reflection provides one with a chance to analyse experiences, tackling problems, and finding solutions for challenging situations (Van Manen, 1995).

In an earlier study, Schon (1983) conceptualised reflection as “reflection-on-action” and “reflection-in-action”. Such referred to teaching as a continuous reflective practice in which teachers reflect and act simultaneously (in-action); and reflect after teaching a lesson (on-action). Mpungose (2018) and Khoza (2016) extended Schon’s (1983) ideas of reflection to include that people also reflect-on-action when they reflect on their professional practices. Reflection in-action negotiates reflection derived from social practices to improve the experience. On the one hand, reflection-on-action in this study meant that participants had to interrogate their actions according to their professionalisation experiences. This kind of reflection was driven by what master’s students had learned professionally about digital technologies that could possibly boost their current experiences (at the time of their participation in the study). For instance, among other participants, Moosa used his undergraduate professional experience with Microsoft Word software to reference all scholars used in his thesis. Additionally, Gcinile attested to using the skills and knowledge she learnt in her computer literacy undergraduate module to prepare slides using PowerPoint for her master’s study proposal defence. In other words, she trusted herself (self-actualised) in using PowerPoint confidently because of the skills she obtained from her previous studies. Both Moosa and Gcinile’s experiences suggest that they were able to “reflect-on-action” in order to attend to their study needs regarding the use of Microsoft Word and PowerPoint.

On the other hand, “reflection-in-action” suggests that, for master’s students to have attained a quality personalisation experience, they needed to interrogate their actions according to their socialisation experience with digital technologies. In this way, they used what they learnt socially about digital technologies to benefit their studies. In other words, students reflected on their skills and knowledge developed from their social communities to enhance their personalisation experience with digital technologies in research. This was evident with Thabo (with emails), Dudu (with cell phone application software), Nkosi (with Google Scholar), Shawn and Akinola (with Endnote). These students were, to some extent, reliant on what they

were taught by their friends, peers, and fellow students enabling them to use specific digital technologies to address their personal study needs.

In addition to the various types of reflections, Khoza (2016) further developed a concept of “reflection-for-action”, meaning that people enhance their experience with digital technologies by drawing from either socialisation (in-action) or professionalisation (on-action) reflections. In this study, “reflection-for-action” is indicated in participants’ personalisation experience. Participants could use either socialisation or professionalisation reflections to address their study needs. Therefore, I argue that reflections are among the essential practices that shape quality personalisation experiences in using digital technologies in research. The scrutiny of participants’ experiences indicates that reflections enabled them to use their prior learning (social or professional) to enhance the use of digital technologies in their research studies. The participants not only reflected on their practices, but they also had to work with stakeholders in their research community to learn how to use digital technologies. Such experiences emphasised the essence of collaborations addressed in the next section.

8.2.2 Proposition Two: Forming collaborations

The second proposition for quality personalisation experience with using digital technologies in research is that master’s students form collaborations with their peers and supervisors or other academics. McCormick (2004) suggests that collaboration occurs when two or more people resolve issues by understanding how something operates. In this study, collaboration relates to how the participants approached other people for help with specific digital technologies. The findings indicated that when participants collaborated with others (peers, friends, fellow students, academics, or supervisors), their experiences with digital technologies were enhanced significantly. For example, Crystal explained how her supervisor assisted her with using SPSS software when she had difficulties using such on her own. Sinowethu and Joseph also attested to being helped by other academics (who were not their supervisors) on understanding the use of Endnote software for referencing research. Their experiences indicate that collaborating with relevant stakeholders can help students achieve quality experience using digital technologies to complete research tasks. Therefore, people who collaborate and support one another with the use of digital technologies can have higher technology self-efficacy (Farah, 2012). The current study's findings also suggested that students can have better

experiences with digital technologies if they form collaborations and support each other where necessary. However, it is worth noting that students should be willing to learn with others to achieve meaningful collaborations.

Gcinile collaborated with another student, supporting her with using Zoom software for defending a research proposal. This collaboration helped in preparing for her official proposal defence. Therefore, the students, had prior practice on Zoom, teaching each other how to navigate through the software. This experience further suggests that students should collaborate with various stakeholders (not only supervisors or lecturers) to ameliorate their experience with digital technologies. To enable collaboration, students should form good interpersonal relationships with these stakeholders. Thus, by collaborating with others, participants shape their understanding of specific digital technologies and how they could best use them in their studies to meet their research needs. It is also essential that students seek collaboration with other people because these collaborations can help them tackle issues collectively. Nonetheless, a quality personalisation experience can be achieved only if students collaborate with people who share expertise on the digital technology they need help with. Students will thus be able to find solutions, solving problems jointly using this expertise. Unfortunately, in this study, some participants (Joseph and Gcinile) collaborated with people who were not fully informed about Endnote. As a result, these students became discouraged and did not use the software in their studies. Their experiences emphasise the need to seek support from people who are knowledgeable and skilled in digital technologies. The question to be asked is what could sustain student eagerness to use digital technologies, even when not assisted sufficiently or facing challenges? The discussion on the value of patience addresses this question in the next proposition.

8.2.3 Proposition Three: Patience

Patience has to do with enduring through challenging experiences. Therefore, students need to have patience when working with digital technologies that may offer a challenging experience. In this study, patience was found to have contributed to participants' success in using digital technologies to complete certain research activities. Patience also related to the experiences in which master's students persevered in learning more about a digital technology that they needed for their studies. For instance, one of the participants (Nthabi) revealed that she had to

be patient with the process of using a tape recorder for the first time. She learnt to use it correctly through making mistakes (trial and error). Nthabi did not know how to use a tape recorder, therefore conducted an interview session without recording it. Her patience was identified when she persevered and persisted through the difficulties she had with using the tape recorder. Similarly, using document analysis, interviews, and focus group discussion, Farah (2012) conducted a case study to explore nine teachers' self-efficacy with using digital technologies in education. The study revealed that factors such as patience and persistence were among many other factors contributing to teachers' self-efficacy with digital technologies that enhance learning. Housand and Housand (2012) also indicated that students who display patience, perseverance, and hard work often succeed when working with digital technologies that offer them challenging experiences.

Moreover, other participants in this study demonstrated patience when they were working with Turnitin. Azania, had to be patient during the process of reducing the similarity report percentage produced by Turnitin, which took four weeks to complete. Jessie also alluded to having patience in altering and amending certain words in her thesis to minimise the plagiarism similarity indicated in her report from Turnitin. Thus, patience is required when students work with unfamiliar digital technologies. In this study, patience was also particularly required when the students worked with digital technologies that were mandatory for their studies. For example, putting a thesis through Turnitin plagiarism software is compulsory for all master's students at Tempo university. Therefore, even though some were having a challenging experience with decreasing the Turnitin plagiarism similarity report (percentage), they had to persevere through the process until they obtained a percentage report acceptable to their supervisors. Azania and Jessie had to be patient with learning how not to plagiarise through the experience of working with a compulsory digital technology (Turnitin).

A difficult experience in using digital technologies can result in extreme frustration and demotivation (Housand & Housand, 2012). Therefore, when students lack patience and perseverance, they might find using digital technologies difficult and time-consuming, as evidenced by Crystal's experience with Grammarly software. Crystal did not have the patience to learn how to use Grammarly, which resulted in her having a 'problematic and challenging experience' with the software. Therefore, the evaluation of participants' experiences suggests

that having patience and persevering through challenging experiences resulting from using specific digital technologies can lead to successful completion of research activities. For example, when Azania and Jessie finally achieved a low percentage on the Turnitin report, they could submit their dissertations for examination. Thus, I must emphasise that students can employ patience as one of their personal values. Patience is a virtue in dealing with challenges that students encounter when using digital technologies in research.

8.2.4 Proposition Four: Seeking guidance, support, and information

In this study, when participants experienced difficulties using a particular digital technology (mostly software), they sought information and guidance in these areas, where they received the help they required. This support further contributed to their quality experience. The participants could thereafter solve problems and find solutions to their issues. Thus, some participants (Moosa, Shawn and Crystal) learnt how to use specific digital technologies through watching YouTube videos. They had to use online platforms such as YouTube to support them in learning how to use specific digital technologies, thus broadening their knowledge and skills. Ebied, Kahouf, and Abdel Rahman (2016) argued that YouTube is an effective platform on which students learn to master computer skills according to their study needs. This effective learning was evidenced in this study when Shawn expanded his knowledge and skills on Endnote by watching YouTube video tutorials on referencing using the software. Similarly, Moosa also learnt more about Microsoft Excel by seeking information from YouTube. Thus, students should be made aware of online software such as YouTube, which they can use to seek more information on digital technologies, thus using them appropriately for their studies.

Participants also sought guidance and support from stakeholders in their research community such as their supervisors, subject librarians and others. In this regard, Shawn did not only seek information from online platforms. Shawn also sought help from his supervisor, subject librarians, and friends, which led him to better understand Endnote. He became progressive with using Endnote to the extent that he wanted to teach others too, indicating that he has learnt and gained expertise in using the software. It is essential to note that seeking information from different areas such as YouTube, his friends, the subject librarian, and his supervisor led to his level of expertise with Endnote, thus highlighting the significance of this proposition.

Other participants (Dudu, Rose, Thabo, Crystal, Sinowethu and Azania) also sought guidance from their supervisors and librarians on accessing articles online. These students further attested to being able to use this information to advance their individual studies in various ways. Therefore, this study's findings suggest that students must identify what they are struggling with in terms of using digital technologies to seek relevant assistance. This support and assistance can improve their skills and enhance their experiences with digital technology. For these reasons, I argue that, for students to achieve quality personalisation experience with using digital technologies, they must seek help through different channels to better their abilities. They should also be able to identify relevant needs for their study, discovering where and when to be assisted. The following proposition discusses self-awareness issues, in which students must become aware of their identities and what works for their individual research studies.

8.2.5 Proposition Five: Self-awareness

Participants demonstrated that they were aware of their identities in relation to their experience with digital technologies. Prensky (2001) and Wang et al (2012) categorised people's ability to use digital technologies according to when they were born, thus giving rise to concepts such as digital native and digital immigrant. In this study, participants seemed to be aware of these concepts and thus were able to identify either as digital natives, digital immigrants, or somewhere in between. It was interesting to note that none of the participants identified themselves as digital natives, even though some of them were born during the digital age. Dudu (born before the digital age) and Gcinile (born during the digital age) both identified as digital immigrants, owing to their lack of experience with digital technologies in the early stages of their lives. In other words, they defined the digital immigrant identity according to lack of experience with digital technologies and not according to generational groupings.

Nevertheless, their identities encouraged them to want to learn more about digital technologies to advance their digital skills. As a result of this self-awareness, both Gcinile and Dudu collaborated with their supervisors and other students to learn more about specific digital technologies. Thus, identifying oneself as a digital immigrant suggests the need to learn more about digital technologies, while identifying as a native suggests the need to enhance one's

skills to be able to use digital technologies in research. Somewhere within the parameters of self-awareness, students can identify their weaknesses and strengths to be able to improve their experiences with digital technologies used in research.

Again, it was intriguing to discover that Crystal and Rose did not identify as digital natives even though they were born during the digital age and were fully exposed to digital technologies during their early years. In a focus group discussion, both these participants positioned themselves between the identities of digital natives and digital immigrants, basing this “*middle position identity*” on that they still needed to learn more about digital technologies. Therefore, as much as they had already had a meaningful experience with digital technologies, they also struggled somewhat, or experienced frustration when using new and unfamiliar digital technologies (Grammarly for Crystal, and Turnitin for Rose). In other words, they did not adhere to any of the two generational identities postulated by Prensky (2001). Therefore, based on the findings of this study, I argue that individuals have broad characteristics that define their experience with digital technologies, and thus their abilities should not be confined only to the age factor. Moreover, the study’s findings showed that people experience things differently and cannot be boxed into fixed categories. There should still be a space for new identities to emerge as a result of people's experiences with digital technologies. Therefore, this study proposes the identity of *Digital Medial* for digital technology users who position themselves in between the two giant identities (Digital immigrants and Digital Natives). This new identity allows students to draw on the well-known strengths of digital natives (having expertise with digital technologies). The identity also enables students to be aware of their lack in using digital technologies; students may thus learn and familiarise themselves more with technologies (a characteristic of digital immigrants). Therefore, being a ‘Digital Medial’ means that students can possess or claim any characteristic from the existing digital native and immigrant identities to substantiate their personalisation experience using digital technologies, as evidenced by Crystal and Rose in this study.

In addition, Bennett et al. (2008); Helsper and Eynon (2010), and Smith (2012) have criticised the validity of the characteristics embedded in the identities of digital immigrants and digital natives, stating that there is much variation between and within both generations. For example, a person can be born as a digital native but only be fluent in using digital technologies for

socialisation, struggling when using them for professionalisation experiences (Czerniewicz & Brown, 2014). Others born in the digital immigrant generational age group use digital technologies effectively to complete research activities (Budden, 2017). Thus, this study refutes these generational claims which limit users to generational groupings and not on their actual abilities to use digital technologies.

Moreover, self-awareness in this study also referred to participants' ability to identify the digital technologies suitable for meeting their individual study needs. The notion of self-awareness is essential. There are various digital technologies that can be used in research; thus, it is the researcher's responsibility to select those that address their own research needs. Therefore, for quality personalisation to occur, participants had to identify digital technologies relevant to their studies so as to continue writing their dissertations, especially during times of uncertainty, such as the COVID-19 period. On the one hand, Thabo and Rose chose to use WhatsApp to continue communicating with their supervisors and fellow students, this being convenient for them during the lockdown. On the other hand, Dudu preferred to use formal platforms such as emails to communicate with her supervisor. In the above cases, the students were able to choose a software that best enabled them to communicate with stakeholders in their studies. To do such, one needs to understand what works for oneself in individual studies, selecting digital technology accordingly.

Moreover, a new digital technology (Zoom) was introduced by Tempo University to expand communication between stakeholders in research; and to also conduct certain research activities, such as defending a research proposal virtually (owing to lockdown restrictions). Gcinile used Zoom to defend her study proposal, while Thabo rejected the use of Zoom in his study, as he was already using WhatsApp to communicate with his supervisor; and had already defended his research proposal. Hence, individual experiences highlight the value of self-awareness and knowing which digital technologies work for personal studies at any given period. Also, enrolling in a master's study during the shift to the 4IR means that one has to be digitally literate (writing a dissertation using a computer, Turnitin, Grammarly, electronic communications with the supervisor, Endnote, PowerPoint, etc.). Therefore, being aware of personal digital needs allows one to find ways to advance digital literacy. Therefore, I emphasise that it is essential for students to become self-aware (of themselves and their study

needs) to be able to engage in learning experiences, leading to using digital technologies that speak to their own research demands.

8.3 Addressing the title: Master's students' experiences of using digital technologies in research

This study was conducted to explore master's students' experiences of using digital technologies in research. To address this title, I formulated three key research questions, which were: 1. What are master's students' experiences of using digital technologies? (Descriptive) 2. How do master's students apply their experiences of using Digital Technologies in research? (operational), and 3. Why do master's students experience Digital Technologies in particular ways? (philosophical/ theoretical). To explore the phenomenon and answer the critical research questions, I engaged with various literature to scrutinise other researchers' findings on the experiences of using digital technologies (Chapters Two and Three). In the literature, the major gap identified was that people often use digital technologies to address social or professional experiences, neglecting their personal experiences. Furthermore, students and other stakeholders were still found to treat digital technologies as a static system (using technology for social, professional, and personal experiences). For these reasons, this study proposed a new conceptualisation of the experiences by indicating them as a process. Thus, I theorised that students use digital technologies to inform their *socialisation*, *professionalisation* and *personalisation* experiences. Following this theorisation, this study empirically explored master's students' experiences of using digital technologies to address their research personalisation needs, as informed by either socialisation or professionalisation experiences.

To further respond to the critical research questions, I conducted a case study using four methods to generate data (discussed in detail in chapter five). These methods included reflective journals, semi-structured interviews, focus group discussions and indirect digital observations to produce empirical findings from fourteen master's students. The findings were presented according to five broad themes and thirteen sub-themes in chapters six and seven, which were analysed descriptively, using my own interpretations and literature references. The first part of Chapter Eight provided a theoretical analysis of the findings using specific concepts of the Persona-Tech analytical framework in relation to achieving quality personalisation

experience. The discussion below expands on how each research question was addressed in this study.

8.3.1 What are Master's students' experiences of using Digital Technologies?

(Descriptive)

This question was answered throughout Chapters Six and Seven of the descriptive data presentation and analysis. In other words, participants' experiences reflected in most themes and sub-themes presented in this study. However, broad themes one and two from chapter six specifically addressed students' positive and negative experiences with using digital technologies in research. According to Khoza (2015a) and Zuma (2020), people use digital technologies to inform their professionalisation, socialisation, and personalisation experiences. Thus, the participants in this study indicated using various hardware and software resources that either contributed positively or negatively to their personalisation experience (driven by socialisation and professionalisation). There was an array of digital technologies the students were exposed to; therefore, they had to employ software or hardware that was suitable for addressing their study needs.

As positive experiences, participants attested to using their prior professionalisation and socialisation experiences to shape their current use of digital technologies for research activities. Participants indicated to have successfully used hardware such as computers and laptops and software such as Microsoft, SPSS, Turnitin, PowerPoint, and search engines to attend to their various study needs. In a similar study on master's students' engagement with digital technologies, Budden (2017) found that students worked well with digital technologies that they were used to, thus accumulating positive experiences. The findings from Budden's study suggest that because students were familiar with these digital technologies, they were able to make them useful for their studies; as a result, positive experiences were evidenced.

Furthermore, participants in this study responded positively to the significance of digital technologies during times of uncertainty. Participants indicated the positive experiences with digital technologies, finding such useful during the COVID-19 pandemic. Participants had to continue engaging in research activities from their respective homes (owing to lockdown

restrictions). By using digital technologies, participants could conveniently continue writing their dissertations, defending their study proposals, and communicating with their supervisors and other relevant stakeholders. Moreover, some participants could use other digital technologies (YouTube and online platforms) to address the challenges they were experiencing with certain software resources. This practice was a positive experience: participants could tackle problems and find solutions to progress with their studies.

Some participants indicated having negative experiences with using some digital technologies in research. These experiences involved being frustrated by using software such as Endnote and SPSS for the first time without proper guidance or training. Thus, some students were left discouraged, and others seeking assistance from various members of their research communities. Another cohort of participants (Dudu, Gcinile and Thabo) complained about the haphazard introduction of new digital technologies employed in research, especially during the COVID-19 pandemic. They had to learn independently and seek help from other students to prepare for using software such as Zoom in their studies.

Participants further explained their negative experiences with the university-recommended software such as Turnitin and Grammarly. Participants expressed their frustration with these software, not receiving necessary support. In the same vein, Zuma's (2020) study indicated that mathematics lecturers struggled with using software such as Turnitin. This software did not accommodate their subject contents, which included numbers, signs, and symbols. Although the cases in the above studies are different, it appears that using Turnitin software illuminates issues such as difficulties in reducing the similarities and malfunctions in dictating mathematics contents. Such has negative effects on both students' and lecturers' experiences.

Moreover, several participants in the current study shared their negative experience of losing their research work stored on USB hardware, which negatively affected their research writing process. It can be concluded that participants had both negative and positive experiences with using digital technologies in research. Such prevailed differently because each student had a unique personalisation experience. In addition, each experience depended on when (stage of

research) and how the student used the digital technology, their competencies, and access to relevant channels that could offer assistance.

8.3.2 How do Master's students apply their experiences of using Digital Technologies in research? (Operational)

In this study, master's students' personalisation experiences with using digital technologies in research were influenced by two factors. These factors included their socialisation and professionalisation experiences. The socialisation experience referred to students' use of digital technologies driven by social or informal learning (Khoza, 2017b). This socialisation occurred when students sought assistance or learnt about digital technologies from stakeholders in their social research community, such as friends, family, fellow students, and peers. In addition, they applied the socialisation experience when they needed to work with other people. Thus, they used social media sites such as WhatsApp and Facebook. The socialisation experience also related to the times students used digital technologies independently without formal instruction or guidance.

The professionalisation experience involves students' use of digital technologies as informed by formal learning (Sokhulu, 2020). This professionalisation means that participants used digital technologies drawing from professional stakeholders' instructions such as their supervisors, academics, subject librarians, or computer-lab managers. The participants applied the professionalisation experience when working with other people on digital technologies such as emails and Zoom. Therefore, to address the second key research question, I had to seek information from the participants to discover how they applied their socialisation or professionalisation experience (regarding the use of digital technologies) to their master's research. I also took screenshots of some digital technologies (those I could access) that participants used as part of the digital observation method to provide the reader with a visual representation of the software digital technologies used in research.

From the professionalisation influences, participants applied what they learnt from various professional stakeholders in their studies to attend to specific research activities. Participants thus explained how they applied their professional skills and knowledge to their research

experiences to enhance their use of digital technologies in their studies. For example, Azania, Crystal, Sinowethu, and Dudu were taught by their academics and supervisors how to access specific search engines; and they all used this information to find articles to be able to write sections such as the literature review in their dissertations. Some participants used information learnt from subject librarians to enhance their use of software, such as Endnote. For instance, Shawn and Jessie used Endnote as influenced by the subject librarians; as a result, they could manage their references properly using the software. Moosa, in his study, attended to his references through the use of Microsoft Word. He applied what he was taught by his previous lecturer on Microsoft Word and its various features and functions. Students also applied the professionalisation experience by using emails to communicate with their supervisors (Dudu and Azania).

Participants also applied socialisation experiences when using WhatsApp to communicate with their supervisors and other relevant stakeholders about research activities. Other students attested to having used information and skills learnt socially in their studies to be able to use specific digital technologies. For example, Nkosi, Thabo, Akinola and Jessie learnt from their friends and Rose, Gcinile, Thabo and Dudu from their peers and fellow students. However, even though these influences were contributing factors that shaped students' experiences, they still had to evaluate and decide on the effectiveness of applying these skills and information to their studies whether to continue or discontinue using them. In other words, students needed to assess whether what they learn socially or professionally was useful in meeting their study needs. For example, discovering from peers that YouTube provides content on various theoretical frameworks, Thabo found valuable information for his study and continued to learn about his study's theoretical framework on YouTube. By contrast, Rose found the same information not useful for her study and learning needs. The differing experiences of Rose and Thabo imply that students' use of digital technologies in research is a unique personalisation determined by a researcher's individual needs. Furthermore, this unique experience is shaped by either socialisation or professionalisation experiences that students obtain by interacting with different stakeholders. Essentially, these stakeholders play a valuable role in offering guidance regarding advancing students' digital literacy to gain a quality personalisation experience with using digital technologies.

8.3.3 Why do Master's students' experience Digital Technologies in particular ways?

(Philosophical/ Theoretical)

This question was the third critical research question formulated in this study. It was also answered through the study's empirical findings. However, Broad Themes 3, 4, and 5 attended to this question in greater detail. Thus, the study's findings enunciated that students' personalisation experiences with digital technologies are either positively or negatively influenced by the socialisation or professionalisation experiences. In other words, students experience digital technologies in particular ways because of their socialisation and professionalisation experiences that affect their practices. Such was evident in Thabo's experience. Thabo attested to difficulties using digital technologies because he solely relied on socialisation to understand them. For Thabo, to use digital technologies in research, he used the skills and information provided by his peers, friends, and family only, neglecting the expertise he could gain with applying professionalisation in his experience. Therefore, his experience emphasised the effects of relying on socialisation only in preparing oneself for digital technology use in research. In other words, Thabo experienced struggles with digital technologies because there was unbalanced support from socialisation and professionalisation experience (only drawing strengths to use digital technologies from one side).

In addition, other participants used both knowledge and skills from their professionalisation and socialisation experience. However, their use of digital technologies for master's research varied according to how they applied these experiences in their studies. On the one hand, Shawn received support regarding the use of Endnote in research from his friends (socialisation), supervisor and subject librarian (professionalisation), which helped him gain expertise on how to best use Endnote in his study to be able to reference accordingly. On the other hand, Akinola also received professional assistance from the subject librarian. Akinola also sought assistance from her friend (socialisation) but still could not fully grasp the use of Endnote. Thus, she chose not to employ Endnote in her study, resorting to a return to manual referencing.

Making an effort to understand both voluntary and mandatory digital technology is essential for a positive experience that leads to self-efficacy (Venkatesh & Zhang, 2010). Shawn's

experience differs from Akinola's Endnote, being a mandatory digital technology in his study, as instructed by his supervisor. As a result, Shawn put continuous effort into understanding the software, alongside his facilitated training. However, for Akinola, Endnote was voluntary; she could stop using it when it became a challenging experience for her (she did not persist with effort in understanding and making Endnote useful for her study). Therefore, in addition to socialisation and professionalisation, effort and mandatory/voluntary use contributed to master's students experiencing digital technologies in particular ways. Hence, it can be concluded that master's students experienced digital technologies in particular ways through contributing factors such as socialisation, professionalisation, personal effort, and voluntary/mandatory use of hardware and software resources.

8.4 Implications and Contributions of the Study

8.4.1 Study implications matching propositions

Based on the study findings presented in chapters six, seven and eight above, four recommendations have been developed to inform master's students' experiences of using digital technologies in research aligned with the propositions stipulated in section 8.2 above. These recommendations can also inform the broader research community, including supervisors, academics, subject librarians, computer-lab managers, academic leaders, and research-office administrators, on how to optimise the research experience so that postgraduate students can meet discipline needs.

Firstly, in connection with the findings of this study, it was found that the students are not equally and systematically exposed to certain new digital technologies. This lack of equal exposure resulted in the haphazard use of digital technologies. Some students claimed never to have heard of a particular software. Therefore, it may be necessary for the university stakeholders to reflect on their practices to identify and address gaps. These reflections can be conducted yearly. Stakeholders such as supervisors, academics, librarians, research students, academic leaders, and research administrators can be invited to reflect on their experiences and on the effectiveness of digital technologies used in research. These reflections can help tackle problems and find solutions to enhance master's students' future experiences with digital technologies.

Secondly, the study findings also indicated that some of the library staff possessed insufficient information regarding new digital technologies introduced to students. Thus, they could not attend to some of the students' queries during training sessions on software such as Endnote and how it operates. The study recommends that the subject librarians be professionally trained on how to use new software such as Endnote and Grammarly. The librarians should become fully informed and equipped with knowledge on how available software operates before arranging training workshops for students. Additionally to the training, these librarians can also collaborate with other librarians from other campuses (outside the School of Education) to expand their knowledge, skills, and understanding of all pertinent software. When collaborating with other librarians, the subject librarians can also tackle problems of software use in preparation to train the students. This prior training and collaboration can boost subject librarians' competence in attending to students' queries during the training workshops.

Thirdly, a number of participants attested to not attending the master's orientation at which there are presentations on specific software useful to conducting research studies digitally. Thus, the study recommends that the master's orientation become a compulsory event to provide all students who enrol in a master's research degree with the support and relevant information. In addition, all those students who are identified as missing the orientation should be contacted for a separate but similar segment that will expose them to digital technologies used in research (mandatory and voluntary). This supplementary workshop would ensure that students are introduced to the necessary digital technologies used in research, relevant support being provided. Moreover, supervisors can work with subject librarians to arrange additional digital technology training workshops for students who seek further guidance. Enthusiastic students can thus develop their skills of using specific software in research.

Fourthly, the world is moving towards the 4IR, meaning that most activities are being digitalised. Aligned with this shift, the higher education sector has also digitalised most practices, thus the vast use of different digital technologies in research. The COVID-19 pandemic compelled universities, academics, and students to use digital technologies to ensure continued teaching, learning, and research activities, as evidenced in this study. Therefore, as students enrol, having diverse digital needs, it is their responsibility to prepare themselves for

digitalised experiences by identifying their strengths. Where they have lack, they can seek relevant support through training and organisational assistance. In other words, it is recommended that students become aware of their identities and assess their digital competencies to learn, advancing their skills.

8.4.2 Implications for future research

This study explored master's students' experiences of using various digital technologies in research. As a result, in-depth data were generated from each participant's unique personalisation experience using digital technologies in their studies. Even though the findings were detailed, there were several digital technologies that the study considered and focused on. For future research, more studies should be conducted with an individual focus on each research digital technology presented in this study (and other emerging digital technologies). This sole focus will provide a deeper analysis of experience with each digital technology used in research.

The study further recommends that more research be conducted to explore master's students' use of digital technologies in research to attain a quality personalisation experience, especially during and after the COVID-19 pandemic. In this light, research can further uncover the effects of the COVID-19 pandemic on students' research experiences which have been fully digitalised. Future research can also provide further in-depth perspective and analysis on how COVID-19 affected master's students' research experiences using new and existing digital technologies in their studies. Moreover, it is recommended that future studies explore experiences beyond personalisation, tapping into issues of naturalisation: natural actions that individuals partake in when using digital technologies. Such studies can also include the various digital technologies that master's students use in their naturalisation experience and preparation for the 4IR.

8.5 Conclusion

This study explored master's students' experiences of using digital technologies in research which produced eight chapters in total. Throughout the study, it was acknowledged that

students use digital technologies to inform their professionalisation, socialisation and personalisation experiences. However, it was identified that socialisation and professionalisation experiences are largely addressed in the literature, personalisation experiences being under-researched. This study, therefore, focused on exploring master's students' use of digital technologies to address personal research needs (a personalisation experience). The study proposed a new framework (Persona-Tech) which was conceptualised using ideologies found in the CHAT and UTAUT theoretical frameworks. Such a new framework would enable a better understanding of students' experiences with using digital technologies in research. This analytical framework was further used in chapter eight to theorise on the study findings.

Thus, the final chapter of the study critically reflected and theorised on the study findings using concepts of the Persona-Tech analytical framework. The chapter began by indicating five propositions that master's students can employ to ensure quality personalisation with using digital technologies in research. These propositions included reflecting on experiences, forming collaborations, having patience, seeking guidance, support, information and self-awareness. The chapter further addressed the critical research questions by indicating how each research question was answered using the study findings and literature. In summary, the findings suggested that master's students relied on their socialisation and professionalisation experiences to understand and use digital technologies effectively in their studies, thus producing a unique personalisation experience informed by their research needs. The chapter concluded by providing implications aligned with four of the five propositions. Additionally, two implications that informed future research were also postulated.

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Appendix A: Reflective Journal

Age: (please tick)

20-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61>
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Gender: (please tick)

Male:	Female:
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Phase in masters' research:

Proposal phase	Writing literature review	Writing the methodology chapter	Generating data	Finalising dissertation	Submitted, waiting for results

Reflective journal

1. What digital technologies do you use in your everyday life? (hardware and software)

--

2. Please reflect on your experience of using digital technologies in your everyday life

--

3. How often do you use digital technologies in research and why?

--

4. How did you learn to use these digital technologies?

--

5. Was it easy/effortless to use these digital technologies? why do you say so?

6. Record any challenge(s) you experience with using the digital Technologies in your everyday life (if any).

7. Do you use any of these digital technologies for research purposes? If yes, which ones? (please map them out)

8. How do you find the experience of using these digital technologies specifically for research?

9. Are there any influences that lead to the ways in which you use digital technologies?

10. Who do you use digital technologies with in research and why?

11. Which of the following professional digital technologies do you use for your research (Please tick)

NVivo		USB	
SPSS		Computer/ laptop	
Endnote		Audio recorder	
Turnitin		Camera	
Google scholar		CD-ROM	
Cloud		Printer	
Microsoft word/Excel/power point		Hard- drive	
e-Library/Books/ Theses		Zoom	
Emails			

12. Which of the following Social digital technologies do you use for your research (Please tick)

Smart phone	
Tablet	
WhatsApp	
Twitter	
Facebook	
Google	
Skype	
YouTube	
LinkedIn	

13. If there are any other digital technologies that you use for research but are not listed above, please indicate them below and explain how you used them

14. What sections of research do you use digital technologies for?

15. What research activities do you use technologies for and why?

16. Does the use of these digital technologies enhance or pose difficulties in your research?
Why do you say so?

17. Are there any theories or instructions that guide your use of the digital technologies in research? Please specify them.

18. What role(s) do you play in using digital technologies in research?

19. Which of the above-mentioned digital technologies are mandatory/compulsory for research use?

20. Are there any available platforms to teach you how to use the mandatory digital technologies for research? Please explain

*****Thank you for your input*****

Appendix B: Semi-structured interview schedule.

I will introduce myself [Lerato Hlengiwe Sokhulu]

I will thank the participant for their willingness to be part of the study; and then I will explain the purpose of the research, which is to explore **Master's students' experiences of using of digital technologies in research.**

I will remind the participants that their participation is voluntary and they can withdraw anytime whenever they wish to do so.

Main research questions

- (1) What are master's students' experiences of using digital technology? (Descriptive)
- (2) How do master's students apply their experiences of using digital technologies in research? (Operational)
- (3) Why do master's students experience digital technology in particular ways? (Philosophical/Theoretical)

Warm up questions

1. What inspired you to enrol for master's Study?
2. Are you teaching currently or are you a full-time student?
3. Which discipline are you specialising in?

Questions asked in relation to:

- (1) What are master's Students' experiences of using digital technology? (Descriptive)**
 - a) What digital technology resources (hardware & software) did you use for your research study?
 - b) How long have you been using them?
 - c) In which **research activities** did you use digital technology for?
 - d) How do these digital technology address your personal research needs?**
 - e) How has your experience been thus far?
 - f) **Have you ever used that kind of digital technology before?** If so how? And what for?

- g) Was there any formal training you received to prepare and teach you how to use digital technology in research?
- h) Were there any other **stakeholders responsible** for assisting you with digital issues in your university? If so did you ever utilise their services?
- i) How do you **communicate with your supervisor and colleagues**?
- j) **Why** do you choose that way/ platform of communication?
- k) Are there any **challenging experiences** in communicating with your supervisor or colleagues using digital technologies?
- l) What are some of the **successful experiences** you encountered with using digital technologies in your research?
- m) Did your supervisor assist you with the use of digital technology in your study? If yes how so?
- n) Which digital technologies do you **find effortless or most challenging to use? Why?**
- o) Which of the digital technologies are **mandatory/compulsory to use?**
- p) Which ones are **optional/ voluntary?**
- q) Which ones did you **prefer to use and why?**

Questions asked in relation to:

- (2) **How do masters students apply their experiences of using digital technologies in research? (Operational)**
 - a) How do you **learn** to use digital technologies? (social or professional)
 - b) How do you apply those learnt skills of using digital technologies in your master's study?
 - c) How do you deal challenges regarding the use of digital technologies in your studies?
 - d) In your opinion, what **lead to the successful use digital technology** till this stage/ end of your study?
 - e) What do you think is **essential** about **conducting research** using digital technologies? Why?
 - f) What learning experience do you come across with using digital technologies in research?
 - g) Are there **any support system providing** you with relevant assistance in the use of digital technologies? If so who or what was it?
 - h) Do you think you have the **competence to** use digital technologies to **enhance** the conduction of your research to completion?

Questions asked in relation to:

**(3) Why do master's Students experience digital technology in particular ways?
(Philosophical/ Theoretical)**

- a) **Why do you think you experience** the use of digital technologies the way that you do?
- b) Do you think your **age and gender affects** your competence in using digital technologies?
- c) Which digital technologies do you think you have **internalised** their use in research?
(the one which you can attest to use subconsciously)
- d) Why do you use digital technologies for your research study?**
- e) Did you have an interest in digital technologies before using it for your research?
- f) Was it a comfortable experience for you to use digital technologies in the way that you did?
- g) Do you **gain access to the digital technology** you use for your study even when you were at home? How?
- h) How do you gain access to the relevant digital technologies for research **on campus?**
- i) What are your feelings and judgements about the overall experiences of using digital technologies in research?
- j) Do you think the **professional training** received for the use of digital technologies used in research was effective? (if any) why?
- k) Does social influence have on your use of digital technologies in research?**
- l) Do you think the use of digital technologies are necessary in research in preparation for the 4th industrial revolution?

Thank you for your time

Appendix C

Focus group interview schedule

Introduction

Welcome and thank you for coming to our focus group discussion. Please feel free to talk and continue to share your experiences with me.

In relation to the first research question:

- 1.1 In what ways did you the digital technologies used in your everyday life help you prepare for the use digital technologies used in research?
- 1.2 How often did you refer to other people for assistance for the use of digital technologies? Who were they?
- 1.3 Did you intend or expect using digital technologies for your research studies? Why?
- 1.4 Do you have any certificates/ prior experiences of using digital technologies for formal events such as studying?
- 1.5 Can you recall of your first experience with using digital technologies such as that for research? When was it (times)?
- 1.6 How did you find that experience?

In relation to the second research question:

- 2.1 What impact did the use of digital technologies have on conducting your research?
- 2.2 Do you think your experience with using digital technologies would be any different if you had/ hadn't used any other digital technologies prior to your study?
- 2.3 What do you think may be the cause for this experience/ feeling?

In relation to the third research question:

- 3.1 What do you think is the cause for you to experience the use of digital technologies in your particular way?
- 3.2 Do you use any of the digital technologies anywhere else other than for your study?
- 3.3 What is your final conclusion on your experiences of using digital technologies in research?

3.4 Why do you say so?

Appendix D

Observation schedule

This observation schedule was used to record participant's social media (software resource) behaviour to explore more of their experiences of using digital technologies.

Participant's name	Social Media Observation (screenshot)	Observer's thoughts and interpretation



Appendix E

Information Sheet and Consent to Participate in Research

Date: 05 February 2020

Dear Sir/ Madam

My name is Lerato Hlengiwe Sokhulu from University of KwaZulu-Natal (Edgewood campus) in South Africa. I am a PhD/Doctoral candidate. I am interested in exploring **Master's students' experiences of using digital technologies in research**. My email address is 211518808@stu.ukzn.ac.za. My contact number is **0787174899** and I reside at Inanda in northern outskirts of Durban. I am gathering information/data from master's Students' hence, my interest in involving you in my study, seeking your reflections.

You are being invited to consider participating in this study that involves research on master's students' experiences of using digital technologies in research. The aim and purpose of this research is to gain an in depth understanding about the explored phenomenon of master's Students' experiences. The study is expected to enroll **15 participants** of a particular university. It will involve the following procedures: **reflective journal, interviewing the participants individually, focus group discussions and observations** as acquisition of data. The duration of your participation if you choose to enroll and remain in the study is expected to be **three months**. The study is funded by the University of KwaZulu-Natal.

Please note that:

- Your confidentiality is guaranteed as your inputs will not be attributed to you in person, but reported only as a population member opinion.
- The individual interview may last for about 30- 45 minutes and focus groups 45-60 minutes which may be split depending on your preference.
- Any information given by you cannot be used against you, and the collected data will be used for purposes of this research only.
- There will be no limit on any benefit that the participants may receive as part of their participation in this research project;
- Data will be stored in secure storage and destroyed after 5 years.
- You have a choice to participate, not participate or stop participating in the research. You will not be penalized for taking such an action.
- The participants are free to withdraw from the research at any time without any negative or undesirable consequences to themselves;
- Real names of the participants will not be used, but pseudonyms (false names) will be used to represent participants' names;
- Your involvement is purely for academic purposes only, and there are no financial benefits involved.
- This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee (approval number: **HSS/0585/019D**).

In the event of any problems or concerns/questions you may contact the researcher at 0787174899 and email 211518808@stu.ukzn.ac.za or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows: Research Office, Westville Campus

Govan Mbeki Building
Private Bag X 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA
04557-
Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za

You may also feel free at any time to contact my supervisors using the following details:

Main Supervisor: Prof Simon Khoza

Tel: 031 260 7595

Email: Khozas@ukzn.ac.za

Co- Supervisor- Dr Nomkhosi Nzimande:

Tel: 031 260 3357

Email: Nzimandem2@ukzn.ac.za

CONSENT

I _____ have been informed about the study entitled __ **Masters students' experiences of using digital technologies in research** by **Lerato Sokhulu**

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 211518808@stu.ukzn.ac.za

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact: **Dr Nzimande or Prof Khoza**

Additional consent, where applicable

I hereby provide consent to: (please tick)

Audio-record my individual and focus group interview

YES	<input type="checkbox"/>	NO	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

Allow the researcher to observe my digital/ social media platforms

YES	<input type="checkbox"/>	NO	<input type="checkbox"/>
-----	--------------------------	----	--------------------------

Signature of Participant

Date



Appendix F

05 February 2019

Ms Lerato Hlengiwe Sokhulu (211518808)

School of Education Edgewood Campus

Dear Ms Sokhulu,

Protocol reference number : HSS/0585/019D

Project title: Exploring Masters Students' Experiences of Using Digital Technologies in Research

Full Approval — Expedited Application

In response to your application received 10 May 2019, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application 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.

The ethical clearance certificate is only valid for a period of 1 year from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully


Dr Shamila Naidoo (Chair)

Humanities & Social Sciences Research Ethics Committee
Westville Campus, Govan Mbeki Building

Postal Address: Private Bag X54001, Durban 4000

Telephone: +27 (0) 31 260 3587/8350/4557 Facsimile: +27 (0) 31 260 4609 Email: ximbap@ukzn.ac.za | snynnanm@ukzn.ac.za | mohunpaukzn.ac.za

Website: www.ukzn.ac.za

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Appendix G: Editing certificate



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E-mail: lydiaweight@gmail.com

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28 June 2021

To whom it may concern

This is to certify that I, Lydia Weight, have proofread the document titled: Exploring master's students experiences of using digital technologies in research, by Lerato Sokhulu. I have made all the necessary corrections. The document is therefore ready for presentation to the destined authority.

Regards



L. Weight

Appendix H: Turnitin Report

Feedback Studio - Google Chrome
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Match Overview

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ABSTRACT

Digital technologies are used by people in order to attend to the 21st century living which often involves digitalised practices. These digitalised practices are driven by the need to meet the Fourth Industrial Revolution (4IR) technology innovation which involves the growing use of digital technologies for various activities. As a result of the 4IR movement, institutions of higher learning use digital technologies for teaching, learning and research purposes to fulfil educational objectives. Particularly for postgraduate studies, students use digital technologies to access published research, generate empirical data, write their dissertations and communicate with their supervisors and other stakeholders involved in their research studies. Literature reviewed in this study indicated that students experience the use of digital technologies in specific ways informed by different socialisation and professionalisation processes. This study explores masters students experiences of using digital technologies as

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