TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING STUDENTS' EXPERIENCES WITH INFORMATION AND COMMUNICATION TECHNOLOGIES INTEGRATION IN THEIR INCLUSIVE CLASSROOMS

By

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DECLARATION

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I declare that the above dissertation is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

I further declare that I submitted the dissertation to originality checking software and that it falls within the accepted requirements for originality.

I further declare that I have not previously submitted this work, or part of it, for examination at UNISA for another qualification or at any other higher education institution.

_____ _____

Signature Date

DEDICATION

To God, the creator of heaven and earth.

To my family, at first, I thought I understood that studying towards a Master's Degree would be challenging but I was not ready emotionally for the challenges; however, having you in my corner made a huge difference. To my husband, Moses "Twin" Ndlovu, I will forever be grateful to God for the love He put in your heart just for me. Your love, support and encouragement has made it possible for me to complete this research. To our children, Vanessa, Charlize and Moses Jr Ndlovu, thank you for loving me. Your patience and understanding meant so much to me.

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ABSTRACT

ABSTRACT

This qualitative interpretive case study focused on experiences of Technical and Vocational Education and Training college students with Information and Communication Technologies integration in their inclusive classrooms. Students' experiences were viewed and interpreted through the lens of Social Cognitive Theory as theoretical framework. Purposive sampling was used to select students, including those living with disabilities, at a college in Johannesburg. Data was collected using interviews, focus group, document analysis and field notes. Thematic Analysis was applied and themes that emerged were students' agentic perspective; fundamental capabilities; behavioural perceptions; academic performance; challenges; benefits; perceptions about lecturers' capabilities to model usage and facilitate effective integration; and views on guidelines for effective integration. The findings indicated that students believed that integration transformed and positively influenced their learning experiences even though there were still gaps to be closed. Recommendations included formation of a dyad, facilitation of a dialogue and upgrade of skills and resources. Recommendations could be used to review NCV and NATED programmes

IQOQA

Lolu cwaningo olusezingeni lokuhumusha kwesigameko lugxile ebungcwetini babafundi basekolishi leMfundo yezoBuchwepheshe nezaMakhono nokuQeqeshwa ngokuhlanganiswa koLwazi lwezoBuchwepheshe nezoKuxhumana emakilasini wabo abandakanya wonke umuntu. Ubungcweti babafundi bubukwe futhi bahunyushwa ngeso leNkolelo yezeNhlalo nokuQonda njengohlaka lomcabango. Ukusampula okunenhloso kusetshenziswe ukukhetha abafundi, kanye nalabo abaphila nokukhubazeka, ekolishi eliseGoli. Idatha yaqoqwa ngokusebenzisa izingxoxo, iqembu lokugxila, ukuhlaziywa kwemibhalo kanye namanothi enkambu. Inhlaziyo yezingqikithi isetshenziswe futhi yaveza izingqikithi ezingumbono ngokwenza kwabafundi; amakhono ayisisekelo; imibono yokuziphatha; izinga lokusebenza kwezemfundo; izinselelo; izinzuzo; imibono ngamakhono abafundisi okumodela ukusetshenziswa kanye nokusiza ukuhlanganiswa okusebenzayo; nemibono

yemihlahlandlela yokuhlanganiswa okusebenzayo. Okutholakele kukhombise ukuthi abafundi bakholelwa ukuthi ukuhlanganiswa kuguqulile futhi kwaba nomthelela omuhle ebungcwetini babo bokufunda yize noma zisekhona izikhala okufanele zivalwe. Izinhlongozo eziphakamisiwe zifaka ukwakhiwa kwe-dyad, ukwenza lula inkulumompendulwano, nokuthuthukiswa kwamakhono nezinsizakusebenza. Lezi zinhlongozo eziphakamisiwe zingasetshenziswa ukubuyekeza izinhlelo ze-NCV neze-NATED.

OPSOMMING

Die kwalitatiewe interpretatiewe gevallestudie het gefokus op die ervaringe van studente aan Kolleges vir Tegniese en Beroepsgerigte Onderwys en Opleiding met geïntegreerde Informasie- en Kommunikasietegnologieë in hul inklusiewe klaskamers. Studente se ervaringe is beskou en geïnterpreteer vanuit die hoek van die Sosiale Kognitiewe Teorie as teoretiese raamwerk. ’n Doelgerigte steekproef is gebruik om studente te selekteer by ’n kollege in Johannesburg. Dit het studente met gestremdhede ingesluit. Data is versamel deur gebruik te maak van onderhoude, fokusgroepe, dokumentanalise en veldnotas. Tematiese Analise is toegepas en temas wat na vore gekom het was studente se agentiese perspektief; fundamentele vermoëns; persepsies rondom gedrag; akademiese prestasie; uitdagings; voordele; persepsies rondom lektore se vermoëns om gebruik te modelleer en effektiewe integrasie te fasiliteer; en beskouinge rondom riglyne vir effektiewe integrasie. Die bevindinge het aangedui dat studente geglo het dat integrasie hul leerervaringe getransformeer en positief beïnvloed het, selfs al was daar steeds gapings om te oorbrug. Aanbevelings het ingesluit die skepping van’n tweetal, die fasilitering van dialoog en die opgradering van vaardighede en hulpbronne. Aanbevelings kon gebruik word om NSB- en NGTOD-programme te hersien.

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LIST OF ABBREVIATIONS

ABBREVIATION	FULL VERSION
4IR	Fourth Industrial Revolution
ABET	Adult Basic Education and Training
AI	Artificial Intelligence
AR	Augmented Reality
BFR	Big Fast Results
BICS	Basic Interpersonal Communication Skills
CALP	Cognitive Academic Language Proficiency
CAP	Competency And Placement
CAQDAS	Computer-Assisted Qualitative Data Analysis Software
CAT	Computer Application Technology
COL	Commonwealth of Learning
COVID-19	Corona Virus Disease 2019
CP	Computer Practice
CS	Cyber Security
CVL	Centre for Virtual Learning
DHET	Department of Higher Education and Training
DL	Distance Learning
DoE	Department of Education
DPME	Department of Planning, Monitoring and Evaluation
DU	Disability Unit
ECD	Early Childhood Development
EWP6	Education White Paper 6
FET	Further Education and Training
FGP	Focus Group Participant
FLDB	Future Leaders in Digital Business
HE	Higher Education
ICT	Information and Communication Technology
IEP	Individualised Education Plan
IIIP	In-depth Individual Interview Participant
IIP	Introductory Information Processing

IP	Information Processing
IoT	Internet of Things
JAWS	Job Access With Speech
LO	Life Orientation
NATED	National Accredited Technical Education Diploma
NCV	National Certificate Vocational
NQF	National Qualifications Framework
ODP	Office Data Processing
RPL	Recognition of Prior Learning
SA	South Africa
SCMC	Synchronous Computer-Mediated Communication
SETA	Sector Education and Training Authority
SNE	Special Needs in Education
SOE	State Owned Enterprise
SPFDPSE	Strategic Policy Framework on Disability for Post-School Education
TEFL	Teaching English as Foreign Language
TPACK	Technological Pedagogical And Content Knowledge
TPB	Theory of Planned Behaviour
TVET	Technical and Vocational Education and Training
UNDESA	United Nations Department of Economics and Social Affairs
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNISA	University of South Africa
USA	United States of America
USAO	Universal Services Access Obligation
VCP	Video Conferencing Platform
VR	Virtual Reality
WPPSET	White Paper for Post-School Education and Training

CHAPTER 1:

INTRODUCTION AND ORIENTATION

1.1 INTRODUCTION

This research explored students' experiences with Information and Communication Technology (ICT) integration in their inclusive classroom at a Technical and Vocational Education and Training (TVET) College in Johannesburg, South Africa. This chapter present the background of the study, research problem and problem statement, research question, sub-questions and objectives, significance of the study, theoretical framework, clarification of concepts, research paradigm, design and methodology, measures to ensure trustworthiness, and how the study is organised.

1.2 BACKGROUND TO THE STUDY

In South Africa (SA), all institutions of teaching and learning, including TVET colleges, should be effectively implementing inclusive education by now and all students should be reaping the benefits believed to come from successful integration of ICT in teaching and learning, given the fact that Education White Paper 6: Special Needs Education Building an inclusive education and training system and White Paper 7 on e-Education: Transforming Learning and Teaching through ICTs were launched in 2001 and 2004 respectively (DoE, 2001; DoE, 2004). Some progress in implementing both inclusive education and e-Education has been made; however, there are still challenges such as inconsistency in implementation, usage and understanding of the policies (Ndlovu, 2015); lack of connection between theory and practice (Mukhari, 2016); and ambiguity on how to implement inclusion (Donohue & Bornman, 2014).

ICT has received considerable attention over the years and continuously plays a major role in education with many researchers reporting the positive impact (Ghavifekr & Rosdy, 2015; Mukhari, 2016; Ramorola, 2013). Moreover, the Fourth Industrial Revolution (4IR) is dramatically changing access to education for students, with computing, applications and engineering such as Internet of Things (IoT), Robotics, Virtual Reality/Augmented Reality (VR/AR), Artificial Intelligence (AI) and Cyber Security (CS). Lives and the work environment are being

transformed by technologies like IoT, Blockchain and AI. Higher Education (HE), including TVET, has a crucial role to play in shaping the societal transitions necessary to adjust to the 4IR (Gleason, 2018). In addition, Corona Virus Disease 2019 (COVID-19) put a focus on the role of ICT in education when teaching and learning activities were halted with schools and institutions forced to close during lockdown. Learners with access to ICT tools and connectivity and with support from their teachers and parents migrated easily to emergency remote learning during the Covid-19 lockdown (Le Grange, 2020). However, the extent to which ICT actually impacts and benefits the learning process and academic performance of the students (diagnosed with disabilities and those not diagnosed) in TVET colleges' inclusive classrooms in SA was unknown, hence this research.

According to Ngubane-Mokiwa (2013) institutions are not using students' experiences to inform ICT integration in the classroom. Therefore, in this study, it was pertinent to look at students' views to determine how institutions can use students' experiences to create an effective [1]inclusive-ICT-integrating classroom.

Nel et al. (2016) emphasised that learning is complex and is influenced by a number of factors especially in an inclusive classroom and teachers have a crucial role to play to accommodate the different needs of different learners and using different teaching strategies and styles. The use of ICT with applicable pedagogical approaches could provide students with an opportunity to construct their knowledge (Ngubane-Mokiwa, 2013); and creates an opportunity for students to learn and accomplish various goals by observing other students and teachers using technology (Blackburn, 2018). Based on this premise, there was a need to understand how students at TVET colleges are experiencing ICT integration in their inclusive classroom.

1.3 RESEARCH PROBLEM

In SA, students enrol in TVET colleges for different reasons and, regardless of what their reasons are, they are expected to achieve the academic standards that lead to certification and then make them employable. Many researchers point out that ICT is a significant tool in education, and if used effectively, it can enhance academic

[1] The classroom is referred to as "inclusive-ICT-integrating" classroom as a concept

performance of students living with or without disabilities in an inclusive classroom (Basri et al., 2018; Ishaq et al., 2020; Nokwali et al., 2015). However, in the TVET college where this case study research was conducted, the situation differed from what researchers attested to.

The events I observed during my tenure as a lecturer and education specialist under the employment of DHET which took place in the college where the study was conducted and those that were published in the same institutions' reports inspired me to conduct this research. These events are as follows:

In 2014, the students were issued with tablets preloaded with study material and e-books in order to assist them not only to access technology during lessons but also to be able to interact with technology even at home. In addition, Digital Video Projectors (DVPs) and smartboards were installed in some classrooms. Wi-Fi was connected and hotspots were activated for students. The students' pass rate in 2015 was 92.36% for National Certificate Vocational (NCV) and 70.17% for National Accredited Technical Education Diploma (NATED) programmes. In 2016, the students expressed concerns regarding tablets. The institution stopped the project of issuing the tablets and went back to textbooks; however, implementation of other interventions such as smartboards and DVPs in classrooms continued. At the time of this study, the students had access to free Wi-Fi using their smartphones at any time; all students had access to classrooms that had laptops, including the resource centre which also had a computer lab. In addition, all NCV students had a computer component in their Life Orientation subject from National Qualifications Framework (NQF) Level 2 to Level 4 and most NATED students were doing Computer Practice N4-N6 and Information Processing N4–N6 as subjects in their chosen programmes. The puzzling thing was that ICT and interventions provided were meant to enhance academic performance of students but instead, seemed not to be doing so. Also, regardless of the fact that the college had 10 computer labs with each lab having a minimum of 25 laptops with the biggest lab having 40 laptops and despite ICT being an integral tool in the college for all students in almost all programmes that were offered, the college had not been able to achieve the results obtained in 2015 or surpass them. Instead, a dramatic decline was experienced by the institution in 2016 with an overall pass rate of 46.59%; and 39.95% for NCV and 45.82% for NATED in

2017; 44.47% and 55.61% in 2018; and 50.88% and 52.64% in 2019 for NCV and NATED respectively as published in the TVET college's annual reports.

In addition, using ICT is a practical method regardless of the ICT tools being used. This means that it requires a lot of practice and time and since many students and lecturers, especially in TVET institutions, only access these tools when they are in the classroom and teaching and learning is time bound, it does not give students enough time to practise and use tools. As a researcher, I noted that many educators were also not confident with using ICT as teaching and learning tools. This disadvantaged some students who might be struggling with the traditional methods of rote learning and deprived them of an opportunity to understand the content that they could easily have understood if it had been presented using audio-visual tools like a smartboard.

The high price of data to access the internet made it difficult for many students and teachers to use ICT optimally. The language used in teaching and learning is English and some students, especially at NCV level, are struggling with the language. As a former computer lecturer I noticed that there are no existing words in other South African languages that describe certain aspects and features of ICT and this means that content is in English which is a barrier on its own. Other problems included limited resources like applications used in classrooms, insufficient smartboards for all classroom, not enough DVPs and not enough computers or laptops.

In 2015, this TVET college adopted the model used by universities and started a Disability Unit (DU) with the purpose of exploring ways to assist students living with disabilities and promote inclusive education. Among the students who registered, from that year (2015) onwards, were blind students, students with dyslexia and students with other special needs such as cerebral palsy, students using wheelchairs, students with speech impairments, and partially sighted students. These students were encouraged to register with the DU voluntarily and those who registered received support in terms of assistive devices such as laptops installed with software called Job Access with Speech (JAWS), voice recorders, special calculators, Zoom Text and text-to-speech applications as well as scanners. They also received support in terms of scribes whose responsibilities were to read questions for students who received concessions from DHET for this service and

then transcribed all the answers that were provided by students during formal assessments. In computer subjects, the scribes would read for the student and the student would be expected to type using JAWS software as an assistive tool for spelling and selection of different options. Even though the focus was on the students with special needs, the college also needed to support lecturers who were going to teach these students as a holistic approach to implementation of inclusive education. It was for these reasons that this research included students living with disabilities.

A significant amount of research has been conducted on ICT integration with much focus on the lecturers and educators' experiences, attitudes, perceptions and feelings with a dearth of research on the students' experiences with ICT integration specifically at TVET colleges in Johannesburg. According to Ndlovu and Moll (2016), training on ICT in South African education has focused on exposing teachers to ICT but it should transcend to how ICT enhances teaching and learning.

The findings of a study on The Influence of Technology on the Academic and Social Lives of Students and Lecturers conducted in HE in Kuwait by Ali (2017) stated that students felt that ICT empowered them, facilitated informal learning, enhanced learner engagement, permitted peer feedback and communication with family and friends and developed intellectual skills.

In a study on Teachers' Perceptions on the use of Technology in the Classroom to Teach Students Identified with Dyslexia conducted in United States of America (USA), it was reported that students with dyslexia had to work hard to spell, pronounce words and read fluently which compromises meaning and comprehension; however, technology improved the ability to read for understanding (Blackburn, 2018).

With this qualitative case study, I intended to elicit empirical evidence to contribute to developing an understanding of the feelings, attitudes, perceptions and any other factors that influence students as they interact with ICT.

1.4 PROBLEM STATEMENT

A number of countries have renewed demand for improvement in TVET systems to make them fit to provide knowledge, attitude and skills needed for employment,

economic, technological and national development (Arfo, 2015). The use of technology, in all aspects of life including education, has become increasingly important with teachers using ICT to adapt the pedagogical techniques to increase academic performance of students (Ishaq, et al., 2020).

In spite of the numerous studies such as *ICT Adoption Impact on Students' Academic Performance: Evidence from Saudi Universities* (Basri et.al, 2018), *Effects of Information and Communication Technology (ICT) on Students' Academic Achievement and Retention in Chemistry at Secondary Level* (Hussain et al., 2017), *Digital Transformation for Inclusive Growth in South Africa: Challenges and Opportunities in the 4th Industrial Revolution* (Manda & Backhouse, 2017), *Impact of Information and Communication Technology on Academic Achievement for Exceptional Student Education Inclusion Students* (Marcino, 2018), and *The role of education technology in Transforming Education at Universities of Technology* (Maribe, 2016), that attested to the fact that ICT enhances academic performance of the students, in the college where this case study was conducted, this proved not to be the case.

In addition, as a researcher, I also noted that lecturers struggled to accommodate students living with disabilities and the DU did not know what assistive devices to give to certain students. Some students without proper documentation such as doctors' reports stating their learning disabilities were also not properly identified and supported in order to use ICT devices to enhance their learning. This also meant that TVET colleges were expected to accommodate, support and ensure that these students also achieved their academic excellence without knowing why they were struggling in the mainstream schools they came from.

Researchers such as Francis (2017), Blackburn (2018), Hu (2017) and Van der Poll (2014) maintained that ICT is a tool that can be used to assist all students regardless of whether they are living with a disability or not, which is why this study's participants included students diagnosed and those not diagnosed with any disability.

It is, therefore, unclear what caused a decline in pass rates, what barriers and challenges were experienced by students with ICT integration, what the feelings,

attitudes and perceptions of students were towards ICT integration, what the benefits of ICT integration were and what factors influenced their academic performance.

1.5 RESEARCH QUESTIONS

The research questions for this study were:

Main research question

- What are the experiences and perceptions of TVET students towards ICT integration in their inclusive classrooms?

The sub-questions were:

- What are the feelings and attitudes of students toward ICT integration in their inclusive classrooms at TVET college?
- How does ICT integration influence academic performance of students at TVET college?
- What challenges and benefits do students at TVET college experience with ICT integration in their inclusive classrooms?
- How can the students' experiences of ICT integration at TVET college be used to form guidelines for TVET college stakeholders?

1.5.1 Aims and Objectives of the Study

1.5.1.1 Aims

The purpose of this research was to explore, describe and explain the experiences and perceptions of TVET college students with ICT integration in their inclusive classrooms.

1.5.1.2 Objectives of the study are to:

- Explore the experiences and perceptions of TVET students towards ICT integration in their inclusive classrooms to propose guidelines for TVET college stakeholders.

- Ascertain feelings and attitudes of students toward ICT integration in their inclusive classrooms at TVET colleges.
- Determine the influence of ICT integration on the academic performance of students in a TVET college.
- Explain the challenges and benefits experienced by students when ICT is integrated in their inclusive classroom at a TVET college.

1.6 SIGNIFICANCE OF THE STUDY

The findings, as stipulated in this research, contributed to the formulation of guidelines to be used in classroom practice. Recommendations could be used to review NCV and NATED programmes. Moreover, the findings could also contribute to knowledge and give insight into ICT integration within an inclusive environment TVET colleges.

1.7 THEORETICAL FRAMEWORK

This study was underpinned by Bandura's Social Cognitive Theory (1986) as the theoretical framework. According to Adom et al. (2018), a theoretical framework is usually borrowed from existing theories to map out, guide and direct the study being researched and it must resonate with all aspects of the study from inception to finish.

Social Cognitive Theory (SCT) emphasises that learning takes place in a dynamic system that includes a triadic reciprocal causation of mutual influence between personal factors (cognitive, affective and biological events), environmental factors (social influences) and behavioural factors (achievement outcomes, learning, academic performance). The role of other people such as students and teachers is important for modelling and observation to take place (Bandura).

SCT was employed and used to establish important links between existing knowledge and the problem that this study was researching and enhanced the significance of this study (McMillan & Schumacher, 2014). This theory was also used as the lens through which I viewed the world and served as the foundation that guided this study from the beginning to the end of the research process (Grant & Osanloo, 2014).

SCT was selected to focus the study on educational and psychological factors of students because of its viewpoints. The first view is that social setting, such as a classroom, is important for learning to take place even though learning is a cognitive process.

Secondly, the agentic perspective stipulates that cognitive processes are not merely emergent brain activities but they wield determinative influence for people to construct thoughts about future courses of action to suit ever changing situations, assess their likely functional value, organise and strategically deploy the selected options and evaluate the adequacy of their thinking based on the effects their actions produce.

Thirdly, the human mind is generative, creative, proactive, and self-reflective not just reactive and learning takes place through observation and modelling stimuli, for example, students observe actions of a model who can be the teacher or peers.

Fourthly, the system of reciprocal causation, behaviour, cognition and other personal factors, and environmental influences all operate as interacting determinants that influence each other bidirectionally. Furthermore, individuals are characterised by five fundamental capabilities namely, symbolising capability, vicarious capability, forethought capability, self-regulatory capability and self-reflective capability (Bandura, 1977, 1989, 1999). According to Bandura (1999), there is an important difference between being conscious of the experiences one is undergoing, and consciously producing experiences.

This theory, as elaborated in Chapter 2, played a crucial role in focusing the research on specific viewpoints to answer the research questions and provided clarity about the students' experiences with ICT integration in their inclusive classrooms.

1.8 CONCEPT CLARIFICATION

In ensuring understanding of this research study, the key concepts are clarified as follows:

- ICT: A collection of hardware devices, software, applications, techniques, skills, methods and processes that apply scientific knowledge (Chen et al., 2015).

- Technical and Vocational Education and Training (TVET) Colleges: Institutions that offer programmes at the post-compulsory phase of learners' schooling life; with levels higher than the general phase of education but lower than university level on the NQF (The Presidency, 2006).
- Inclusive Classroom: A classroom where students living with disabilities and those without disabilities are combined and taught at the same time, in the same class and receive same content using the same or similar resources (DoE, 2001; Donohue & Bornman, 2014).
- Students living with disabilities: A group of individuals living with conditions, whether mental or physical that are imposing limitations and hindering them from participating fully in teaching and learning activities (Francis & Silvers, 2016).
- Assistive Technologies: Type of technology including devices and applications that can be used by people living with disabilities to assist them to perform activities that they would not be able to do otherwise (Blackburn, 2018).

1.9 RESEARCH PARADIGM

This study was embedded in an interpretivist research paradigm and adopted a subjective and interpretive perspective to analyse data inductively to gain in-depth understanding of participants' experiences, feelings, attitudes and perceptions in their natural setting (Van der Poll, 2014). The ontology of this study was that there was no single reality or truth but the reality was created by the individuals who participated as they shared their experiences which were then interpreted to extract meaning (Creswell & Creswell, 2018). The epistemology was therefore underpinned by the assumption that reality needed to be interpreted, which meant that I had to interact with participants, understand their background, culture and worldview. To do this, I interviewed them about their experiences, feelings, attitudes and perceptions which then answered the main research question and sub-questions. According to Creswell and Creswell (2018, p.5), epistemology is concerned with the relationship between the "knower" which refers to the research participants and the "would-be-knower" who was the researcher (me).

1.10 RESEARCH DESIGN AND METHODOLOGY

Research design and methodology, which is elaborated on in Chapter 3, pertains to the type of the study and provides an outline of the process that was undertaken to conduct the research, collect and analyse data (McMillan & Schumacher, 2014).

A qualitative research approach was used to conduct this exploratory study. Most qualitative research studies are exploratory because of the limited knowledge that exists about the topic or the participants and the researcher, therefore, attempts to interpret what participants say to create an understanding for the phenomenon (Creswell & Creswell, 2018). Researchers use the qualitative approach to explore, describe and explain social phenomenon, unpack and understand the perspectives of participants about activities, situations or events in their lives (Leavy, 2014) and to contribute to practice and policy (McMillan & Schumacher, 2014). In following the characteristics of qualitative studies, this research was conducted without any control imposed on the participants (Creswell & Creswell, 2018; McMillan & Schumacher, 2014) using in-depth interviews, focus groups, document analysis and field notes (Creswell & Creswell, 2018).

Case study research design was selected. Case studies are preferred for exploring participants' behaviours that cannot be manipulated and contemporary events or sets of events that took place in the past or present (Yin, 2018). According to Creswell and Creswell (2018), case studies are used by the researcher to collect informative data using a variety of methods and are bound by time and activity.

The source of information in qualitative research is vast (i.e. individuals, groups, documents, reports and sites), and regardless of the type of data, purposeful sampling is used (McMillan & Schumacher, 2014). Creswell and Creswell (2018) further stated that a clear strategy should be formulated for how the participants would be recruited and be informed about the study. Students were recruited from the TVET college described in the background because of its unique concept of ICT integration and DU. Purposive sampling was used to find experts (Denzin & Lincoln, 2018) and a total of 16 students participated in the study from NCV and NATED programmes.

1.11 DATA ANALYSIS

Data analysis is a systematic process used by researchers to organise and summarise collected data using different techniques in order to find meaning that lead to presentation of results (Creswell, 2014; Leavy, 2017; Trent & Cho, 2014) while adhering to ethical guidelines such as protecting the identity of the research participants (Creswell, 2009).

Sequential steps of Thematic Analysis (TA) involving multiple levels were followed to ensure efficient outcomes of the data analysis process. TA is widely used by qualitative researchers, across a range of epistemologies and research questions, for identifying, analysing, organising, describing and reporting themes in the data set (Nowell et al., 2017). According to Creswell and Creswell (2018), when planning for data analysis and interpretation, researchers should consider simultaneous procedures of data analysis while still collecting data; extracting the data by focusing on some data and disregarding other parts of data that are irrelevant; and using Computer-Assisted Qualitative Data Analysis Software (CAQDAS) like Atlas.ti. for assistance. CAQDAS are computer programs that are used by researchers to store and code text, graphic, audio and/or video data; to search content; to locate and explore relationships between codes; and to link visual to audio and text data (Antoniadou, 2017).

In this study, Atlas.ti was selected and data analysis took place while collection was still in process. No data was disregarded. In many cases, qualitative studies seek to clarify the behaviour of people based on their thoughts and feelings and the researcher's role is to interpret the data in the light of the theoretical framework (Sutton & Austin, 2015). Using an inductive analysis process, I synthesised and created meaning from the collected data, forming patterns from specific to general categories of data (McMillan & Schumacher, 2014), through the lens of SCT as the theoretical framework.

1.12 MEASURES TO ENSURE TRUSTWORTHINESS

This research study used the criteria that are accepted by many qualitative researchers as outlined by Guba and Lincoln (2001). Trustworthiness was established through ensuring credibility, dependability, confirmability and

transferability. According to Anney (2014), trustworthiness criteria are meant to address questions like how a researcher can ensure that findings are accepted as the truth by other readers; how other readers can ascertain that the findings will apply in another setting or with different participants; how other readers can be assured that if conducting a similar study in a similar setting with similar participants that they will get similar findings; and how other readers can know for sure that interests and biases of the researcher did not influence the findings but they were solely based on the participants' perspectives.

1.13 COMPLIANCE WITH ETHICAL STANDARDS

Approval from the UNISA Research Ethics Committee was applied for and received prior to conducting this research (Appendix A). Permission was sought from the TVET college principal to conduct the research (Appendix C). All participants were informed in writing of the purpose and objectives of the research; methods, devices and activities for collecting data; to ensure that all participants clearly understood and took informed decisions (Appendix E). Ethical standards were adhered to as stated by Creswell and Creswell (2018), such as informing participants in writing, soliciting written consent, considering interests and wishes of the participants including giving them codes/pseudonyms to assure anonymity, verbatim transcriptions and making written interpretations and reports available to participants.

1.14 DELINEATION AND LIMITATION OF THE STUDY

This study had some limitations such as a dearth of literature that focused on students' experiences on ICT integration in South African TVET colleges. Other limitations for this study were similar to other studies in the education context as outlined by McMillan and Schumacher (2014) including programme variability being offered by institutions, diversity of population, complex research problems, methodological difficulties, legal and ethical considerations and many other influences impacting public education institutions. In outlining the delineation, in Chapter 3, this study elaborates on the profile of the participants selected to participate in this study.

1.15 ORGANISATION OF THE STUDY

This research has five chapters.

CHAPTER 1 – INTRODUCTION AND ORIENTATION

This chapter provided an introduction, the background, rationale and problem statement; aims, objectives and the research question; a brief outline of the research methodology that guided the research; the significance of the study, limitations and ethical considerations.

CHAPTER 2 – LITERATURE REVIEW

This chapter presents a review of the existing literature on the topic of ICT in education, integration, tools, challenges, benefits, experiences and the theoretical framework.

CHAPTER 3 – RESEARCH DESIGN AND METHODOLOGY

This chapter details information on processes followed in conducting the research such as method, design, sampling, data generation instruments, reliability, validity, trustworthiness, and ethical considerations.

CHAPTER 4 – PRESENTATION OF RESULTS

This chapter presents the details of how data was analysed, the strategies and software used, and the findings of the study.

CHAPTER 5 – DISCUSSION OF FINDINGS AND RECOMMENDATIONS

In this chapter, the findings are discussed, and recommendations, implications for practice, limitations and a summary of the study are provided.

1.16 CHAPTER SUMMARY

Chapter 1 introduced the study, presented the background for the research that was conducted. It painted a picture of the importance of this study, background of the selected site for the study and reason why it was selected; brief information of the literature, methodology and data analysis technique chosen; introduced the theoretical framework, SCT, that guided the study and what is presented in each chapter.

CHAPTER 2:

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter gives the context on which this research was set followed by a review of the literature that explored ICT integration in education and inclusive classroom as well as the trends in the use of ICT tools. Findings by other researchers of ICT impact in the classroom, internationally and in SA are examined to establish important links between existing knowledge and the problem that this study was researching; and to enhance the significance. The chapter analyses the limitations of the studies conducted by other researchers in order to justify the contribution of this study. Thereafter, the chapter elaborates on review of literature relating to the key theory – Bandura's Social Cognitive Theory that informs the theoretical framework on which this study is underpinned, to give clarity on the rationale.

2.2 RESEARCH CONTEXT

It was stated in the previous chapter that the research topic for this study had been under-researched; therefore, this literature review tapped into the knowledge and expertise of the scholars who had researched topics of a similar nature. In this chapter, the role, benefits and challenges of ICT in education globally, in Africa, in SA, in TVET and in the classroom including inclusive classrooms are explained and gaps in the literature are identified.

2.3 ICT IN THE EDUCATION CONTEXT

ICT in education refers to a range of scientific artefacts, hardware, application software and digital devices that have been designed and used to process, store, retrieve, communicate, organise and share information, including playing games, gaming and gamification in the education context and for educational purposes. Addam (2014) described ICT in education as encompassing hardware such as desktops and laptops, digital tools, projectors, data logging devices; software applications including multimedia resources; information systems like internet and intranet; and use of digital technology by students and lecturers for teaching and learning purposes. ICT could also be used for purposes other than education by

students and teachers; although this could be negative in the education context. Mir and Shakeel (2019) pointed out that the negative aspect of using ICT in the classroom was when students and teachers used their mobile phones and tablets for leisure purposes to surf the internet, watch videos, play games and socialise through social networks which distracted teaching and learning. Successful integration of ICT in education should result in a better quality of education which is usually measured by the academic performance of the students in that institution. Donald et al. (2014) stated that quality in education was more than just the academic performance of students. To judge the quality of education holistically, it is important to look at the nature of social interaction in the education process by examining how meaningful education was to those involved; whether it provided competency, confidence and healthy development required by the person; and whether it empowered everyone involved and not only a few people. This meant that the outcome of integrating ICT in education, as explored in this study, should not be limited only to the academic performance of the students and should not benefit only a few stakeholders.

2.4 ICT IN GLOBAL EDUCATION

Globally, ICT use in education was already increasing as an imperative part of education system and curriculum; but Covid-19 put a spotlight on it, exposing inequality especially in countries and institutions that were struggling to integrate it effectively. In a study conducted in Kohat in Pakistan, Hussain et al. (2017) reported that speedy advancement of ICT had brought changes to the global society, but developing countries struggled to keep up with the technological revolution. Basri et al. (2018) conducted a study in Saudi Arabia and reported that many sectors across the globe regarded ICT as the most important source of innovation and improvement for efficiency. In a study conducted in Philippines, it was found that people had access to information quickly with the use of ICT, information resources were abundant, and that made the world seemed smaller with everyone reachable at the snap of a finger, using a wide range of technological devices (Dela Rosa, 2016).

ICT created a variety of methods for students, especially those in HE, to receive and access education. According to United Nations Educational, Scientific and Cultural Organisation (UNESCO) and Commonwealth of Learning (COL), teaching and learning with ICT support could take place face-to-face, online, full-time, part-time,

regardless of the distance between the student and the institutions or the instructor but it depended on the institution, social and economic needs in each country and student (UNESCO and COL, 2017). Software applications like Zoom allowed lecturers to have more than one student on an online platform. In HE worldwide, students were using ICT in and out of the classroom setting; and it had become an integral part of their learning process (Basri et al., 2018). Future teaching and learning situations that were not supported by ICT were hard to imagine (Hussain et al., 2017). Ali (2018) reported that students across the world could remotely access education with the use of internet and technology devices; and that changed teaching and learning from traditional ways and environment to virtual environment for students and teachers. Marcino (2018), in a study conducted in United States of America, posited that expansion of digital world meant that all careers would demand applicants to have basic skills of ICT. In addition, Hussain et al. (2017) stated that ICT played a role in preparing students for the real world and it would enrich students with skills and knowledge that they required for work place. Basri et al. (2018) stated that HE institutions, government and stakeholders in education worldwide had invested millions of dollars to integrate ICT in education but the impact that ICT had on the academic performance and achievement of students was not clear. This is the motivation for the current research.

In the report on using ICT and blended learning in transforming TVET, UNESCO and COL (2017) pointed to challenges in some countries such as lack of access to affordable and reliable broadband connection; unaffordable technologies like computers, smartphones, tablets even though they were becoming cheaper; expensive data; and crime where technology tools were stolen which could be a barrier for students to participate fully with limited resources and fear that their resources could be stolen.

The important role that ICT plays in the world and the expectations of employers regarding competency in ICT for future employees has been highlighted which is why views of students regarding ICT integration in relation to their future and the world are important.

2.5 ICT IN AFRICAN EDUCATION

African countries have made significant progress regarding ICT integration. In a continent that had been lagging behind, in recent years, sub-Saharan Africa has improved dramatically in using technologies in education (Mtebe & Raphael, 2017). ICT access and utilisation had been evident in the wealthier nations of sub-Saharan Africa such as SA, Botswana, Mauritius and Seychelles (Samarakoon et al., 2017; UNESCO, 2015).

Even though progress has been made in Africa in respect of ICT in education, there are still challenges that need to be addressed like some misapprehension that merely making technology available would innovate education. Interest in the advancement of technology and ICT's role in changing education results in Africa is increasing rapidly (Samarakoon et al., 2017). Stakeholders such as governments, institutions, educators and students seem unsure of the role to play in ensuring the effective use of technology in education but rather seemed to have "technological fix" attitude without paying attention on the implications of this attitude on policy and pedagogy (Samarakoon et al., 2017, p.649).

The demand for ICT in teaching and learning has grown, countries are attempting to meet the skills shortage in digital competencies which is a process that requires teachers to also possess the capabilities, skills and strategies to integrate ICT effectively in their classrooms. The purpose of teacher professional development for digital learning as stipulated in the Professional Development Framework for Digital Learning, is for teachers to advance in pedagogical foundation, integrate digital tools and resources in teaching and learning and see the value in the use of digital tools and resources (DBE, 2018). The framework focused on perceptions of teachers towards ICT integration and how they can be developed.

There was scarcity of studies that investigated the experiences of students especially in TVET, however, the importance of teachers' perceptions for the successful integration of ICT had been established. For instance, Luhamya et al. (2017) stated that barriers to ICT integration in Africa could be divided to internal and external barriers. Internal barriers refer to attitudes and perceptions about technology, especially of teachers; and external barriers refer to availability and

accessibility of ICT resources by those who are using it in the education context, namely students.

UNESCO (2015) acknowledged that there was lack of data in sub-Saharan Africa from which to draw conclusions on the impact of ICT in education. The findings of a study conducted in Zimbabwe on university students' perspectives on the use of digital technologies in education indicated that students valued ICT integration; however, they expressed their disappointment with the fact that availability and accessibility to technology had not transformed teaching and learning which was still traditional within the institution (Dube & Scott, 2017). Students also expressed their unhappiness and dissatisfaction with the teaching strategies that were not using digital technologies which led to ineffective integration of ICT (Dube & Scott, 2017). The findings of this study revealed what students were not happy about.

Another study by Sakala and Chigona (2017) investigated lecturer resistance during ICT implementation in HE in Zimbabwe and found that many HE institutions had integrated ICT but the consumption was very low. In answering the question on what form of resistance behaviour lecturers displayed during ICT integration, the findings included 'passive resistance' which indicated that lecturers avoided using technology for teaching and learning (Sakala & Chigona, 2017). Munyengabe et al. (2017) on teachers' perceptions of ICT integration in Rwandan schools found that the learners benefitted a lot from teachers who had a positive perception because those teachers understood the importance of using ICT as a teaching and learning tool. Akinde and Adetimirin (2016), in a study conducted in Nigeria, stated that teachers who perceived ICT as useful were more inclined to use it in their classroom. According to Luhamya et al. (2017), in a study conducted in Tanzania using the Theory of Planned Behaviour (TPB), teachers were motivated to use ICT if they perceived it to be important.

Mtebe and Raphael (2017) reported that in Tanzania, enrolment in HE was very low even though the institutions made efforts to increase the enrolment numbers, and changes in ICT were forcing HE institutions to re-evaluate the strategies they were using for teaching and learning. The University of Tanzania established the Centre for Virtual Learning (CVL) which aimed to speed up technology-enhanced learning (Mtebe & Raphael, 2017). Tanzania invested in the infrastructure to support

technology integration like many countries; however, Kaliisa and Picard (2017) noted, in a systematic review on mobile learning in HE in Africa, that poor supply of electricity and network failures were among the challenges for some African countries in realising the goal of effective implementation of ICT. The lack of electricity as a challenge in Africa was also found by Samarakoon et al. (2017). In a study conducted in Sierra Leone, Samarakoon et al. (2017) posited that students and teachers had access to 3G internet for educational purposes; however, underqualified and unqualified educators were the main reason why institutions were struggling to implement pedagogical strategies that integrated ICT effectively. Educators' levels of ICT competency were not determined by their level of education, which meant that an educator could have many degrees but still struggle to integrate ICT into teaching and learning in the classroom (Luhamya et al., 2017). A review of ICT integration in Africa revealed gaps. This study therefore explored whether TVET students experienced similar barriers.

2.6 ICT IN SOUTH AFRICAN EDUCATION

In SA, the government regards ICT as an integral tool in addressing socio-economic challenges like poverty, inequities, educational development and sharing of information and has put policies in place to ensure that universities, TVET colleges and schools adopt and use ICT (Van der Poll, 2014). Padayachee (2017), in a study investigating ICT integration in South African schools posited that even though ICT in South African education was regarded as a panacea for challenges in the classroom, it had been restricted by operations, strategies and pedagogy. In 2004, the Department of Education (DoE) published that by 2013 every South African learner, in basic and HE, would be equipped to use ICT with confidence in developing necessary skills and knowledge required to fully engage in the global community (DoE, 2004). However, Van der Poll (2014) pointed out that by 2010, only 10% of South African schools had computers and the progress was visible in Gauteng and Western Cape which were the two provinces considered to be economically strong out of the nine provinces of the country. That clearly indicated that the implementation of the government's plan was very slow. The Department of Planning, Monitoring and Evaluation (DPME) published that the government adopted the Big Fast Results (BFR) problem-solving method, that originated in Malaysia, and renamed it Operation Phakisa ("phakisa" meaning "hurry up") in order to fast-track

the implementation of ICT integration in education in SA (DPME, 2020). In 2015, the then President of SA, Mr Jacob Zuma, launched Operation Phakisa in ICT in education and five key areas were identified as: connectivity, devices, teacher professional development, digital content development and distribution, and e-administration (DPME, 2020). With that project, 54% of schools were connected and received devices and were monitored using Universal Services Access Obligation (USAO) project (DPME, 2020). The DPME indicated that the government had made strides in integrating ICT in education. However, Padayachee (2017) asserted that the government and HE, which includes TVET colleges, had an urgent need to create guidelines to enhance pedagogy. As a researcher, I believe that the experiences of students should be taken into consideration when formulating guidelines and modifying the pedagogy.

According to Maribe (2016), South African HE was struggling to implement policies and needed to incorporate modern technologies to overcome this challenge. Manda and Backhouse (2017) stated that the SA government needed to draft strategies and policies in response to opportunities and challenges of digital transformation brought about by the 4IR. Taking into consideration the perceptions, feelings and attitudes of students, policies could be modified and strategies developed. Maribe (2016) stated that students believed that transformation was driven by technology but it was the responsibility of all stakeholders, including students and educators, to ensure that technology played its role in education. Makura (2014) stated that there were many benefits of ICT integration such as its potential to transform education, society and the economy, but HE institutions were slow and needed to seize the opportunity to migrate into digital age.

SA attempted to integrate ICT in education but there were challenges like those experienced in other countries in Africa such as infrastructure, resources, pedagogy, educators who were not ICT-competent, data, electricity, crime and socio-economic challenges. In SA, the State-Owned Enterprise (SOE), Eskom which supplies electricity, continuously implemented power interruptions known as load shedding. The power utility hindered the use of ICT in the classroom because during load shedding, students and teachers were not able to use technologies and some institutions did not have backup systems like generators (Van der Poll, 2014). Even though teaching and learning could continue, in the classrooms where ICT was

utilised like classrooms with smartboards and computers, there were interruptions. In 2014, United Nations Department of Economic and Social Affairs (UNDESA), reported that educational benefits of electricity access included integrating ICTs in the classroom like television and computers (UNDESA, 2014). In SA, at the time of conducting this study, there were schools that did not have electricity at all and integrating ICT in teaching and learning was a huge challenge for these schools; however, all HE institutions had electricity and their power problem was largely load shedding which impacted negatively on students' use of ICT devices in and out of the classroom.

2.7 ICT IN TVET COLLEGES

An analysis of the reasons why students experience challenges in their academic performance in TVET colleges in SA revealed that the under-preparedness of students for the TVET curriculum, the language of instruction, academic support programmes in the college, provision of educational resources such as ICT and assessment approaches had negative and/or positive influences on access, participation and success (Nzembe, 2018). The world believed that quality of education in tertiary institutions was enhanced by ICT but there is plethora of circumstances that obstructed the effective integration of ICT and there was shortage of empirical evidence that showed the experiences of educators in negotiating and using technology for teaching and learning purposes (Van der Poll, 2014). Ali (2017) stated that technology had not only transformed the way people communicated in their social lives but it influenced how students and educators used the emerging technologies for academic and social purposes. Even though ICT had been recognised as beneficial, Makura (2014) reported that it created anxiety for students in South African HE institutions; and integration had been below what was expected. According to Van der Bijl and Oosthuizen (2019) research showed that only few SA TVET college lecturers had adequate academic, workplace and teaching qualifications. A Training Needs Assessment Study conducted in 2014 revealed a number of academic challenges in South African TVET colleges including shortcomings in lecturers' competencies for effective teaching and learning which increased interest by researchers to find the solution with a focus on lecturers (Badenhorst & Radile, 2018). To attempt to close the gap highlighted in this section, the Minister of HE, Science and Innovation, Dr Blade Nzimande, emphasised the

important role of ICT for TVET stakeholders and announced plans to issue laptops to National Student Financial Aid Scheme (NSFAS) beneficiaries and Huawei ICT Academy Programme for all TVET colleges to train lecturers by 2021 (Presidency, 2020). This current study wanted to reveal students' perceptions about the capabilities of lecturers to integrate ICT which should be considered in creating programmes to close the gap.

2.8 ICT AS A TEACHING AND LEARNING TOOL IN THE CLASSROOM

The impact of ICT is on all aspects of education including how students are taught, assessed and evaluated, and this impact depends on how digitally literate teachers are and whether they understand and able to integrate it effectively into the curriculum (Mir & Shakeel, 2019). Blackburn (2018) stated that in today's classrooms, integrating ICT supports the learning styles of digital natives whose lives revolve around technology. However, Ramarola (2018) stated that the challenges faced by South African schools include the digital divide, the adoption and implementation of the ICT policy, professional development, and cyber security.

Covid-19 affected classroom teaching and learning and forced many institutions to rely on ICT to continue with education activities. Using ICTs during the Covid-19 pandemic illustrated limitations of and opportunities for ICT use (Yang et al., 2020). In SA, as indicated by Le Grange (2020), Covid-19 showed up the inequality in education with learners from affluent private schools migrating easily to remote learning during lockdown because they already had ICT tools and connection while educational activities for those in public schools were halted. In spite of the inequality in SA, ICT as a teaching and learning tool was acknowledged as imperative in both the classroom and academic life for those who were using online platforms to study. According to Hu (2017, p. 2665), educational software was used to "reinforce the acquisition of knowledge, increase retention and most effectively for teaching subjects like language". This study intended to find out how ICT impacts the classroom experience of students because the Fact Sheet on Throughput Rate of TVET College Students (Khuluvhe & Mathibe, 2021) indicated that only 9.2% of students who enrolled for NCV Level 2 in 2016 were able to complete their Level 4 in 2018 as expected. This clearly indicate that ICT is not effective or is not used. Ali (2017) stated that ICT had dramatically altered not only the lives of students but also

the role of instructors and the processes of teaching and learning, and it had been adopted and integrated by governments and education institutions. Mir and Shakeel (2019) posited that students used ICT tools like mobile phone, tablets and laptops which allowed them to access education-enhancing programs and play games. Behavioural perceptions of these students involved learning, working, interacting, playing games, gaming and gamification through the use of technology and applications. It is therefore, expected that personal factors of these students would be influenced by ICT usage because SCT indicate that personal factors are influenced by behaviour and also influences behaviour. Pholotho and Mtsweni (2016) stated that some subjects with a high failure rate in South African high schools include drama, music and science with one contributing factor to this being that teachers were using outdated textbooks instead of ICT. Moreover, lack of ICT infrastructure in the rural schools in SA had negatively impacted learners' performance (Pholotho & Mtsweni, 2016).

It was recommended by Makura (2014) that HE should invest in ICT integration because research had proven that the institutions that invested in ICT had better students' academic performance and throughput rate. Makura (2014) further recommended that students should be exposed to ICT from school level before they reach HE because that would assist them to cope and feel motivated. Most students, in SA have access to at least one technology device (e.g., smartphone) but the challenge is how this access to technology can be used in the classroom for teaching and learning purposes. In a study conducted in Kuwait, Ali (2017) stated that most institutions were struggling to find innovative ways to create a teaching and learning environment that integrated ICT in the classroom and distance learning. Blackburn (2018) stated that there were benefits of using ICT as a teaching and learning tool because of its mobility and that its use was not limited to the classroom but could also be used at home. Blackburn (2018) further stated that the key component to effectively integrate ICT in the classroom relied on the capability to match the technology device with the education needs of the students. This study investigated the views of students on the usefulness and purpose of their devices. Blackburn (2018) reported that effective integration of ICT as a teaching tool was influenced by the perceptions and beliefs that teachers had. Teachers who were comfortable, knowledgeable and confident with using the technology as teaching

tools integrated ICT in a manner that benefitted the students but those who were anxious and negative toward technology disrupted ICT integration (Blackburn, 2018).

2.9 ICT IN INCLUSIVE EDUCATION

The Samalanca World Conference on Special Needs Education (SNE) set the base for international countries to adopt the principle of education for all, highlighting that learners with specific needs also need to be included into the mainstream education system regardless of disability (UNESCO, 1994). As adopted in SA, inclusive education is linked to the causes of social justice and human rights enshrined within the principle of providing equal education access, support and accommodation to all learners with diverse learning needs within the mainstream classroom (DoE, 2001). It took a while for SA to finalise and approve the policy framework for the post-school system. According to Makanya (2015), in 2015, there was no policy or specific procedures that guided the TVET institutions on how to teach and support students with learning disabilities. It was in 2018 when the Strategic Policy Framework on Disability for Post-School Education (SPFDPSE) was approved by the then Minister of HE and Training, Naledi Pandor (DHET, 2018). The SPFDPSE was founded on the Bill of Rights which condemns segregation of persons with disabilities in SA and, therefore, promotes the implementation of inclusive education (DHET, 2018). With the policy in place, one would expect clear guidelines on supporting students in inclusive classrooms in the post-school system. The policy emphasises the key role of ICT and Disability Support Offices within institutions (DHET, 2018). In this study, it provides the background to make sense of the aspects of support from the institution's DU and access to ICT for students living with disabilities in the selected TVET college.

Francis (2017) reported that ICT supported different types of approaches to learning could motivate learners and be assistive devices to those with special needs. Motivation and engagement of students improved when ICT was integrated in teaching and learning (Francis, 2017). SPFDPSE clearly highlighted that the lack of inclusive teaching and learning methodologies remained a barrier that should be further interrogated (DHET, 2018). According to Donald et al. (2014), there is no classroom environment that is perfect for all students but efforts should be made to create a positive environment that would take into account the diversity of students,

their needs, values and cultures. Blackburn (2018) reported that the use of ICT involved several senses with the intention of achieving improved comprehension of the information and could make a learner's academic experience more positive. Based on these arguments, the current study interrogated students' experiences in an inclusive-ICT-integrating classroom.

Makanya (2015) pointed out that lecturers had no guidelines to follow in implementing inclusive education and provisioning of resources was a decision of each college without any set standard procedure by DHET. The policy framework (DHET, 2018, p. 30) states that provision in many institutions is based on the assumption that students' barriers could be solved by particular equipment (the classic "technological fix" mentality). According to Tony (2019) there is a wide range of assistive devices such as spellcheckers, voice recognition and word prediction software which are effective in catering the needs of learners with learning barriers. During my tenure as a lecturer at TVET, I used a variety of ICT tools to teach students and some of my students used assistive devices such as JAWS and Dragon. It was imperative to investigate the type of ICT tools that the participants were using and how effective were those tools for their learning process. ICT tools could improve dialogue between students and lecturers in a distance learning (DL) environment (Ngubane-Mokiwa, 2013). This research investigated whether face-to-face interaction and dialogue in inclusive-ICT-integrating classroom improved. According to Ndlovu, (2021), students felt patronised by those living without disabilities, who were deciding and imposing certain technology tools and assistive devices that they deemed relevant without consulting the students. This indicate that students living with disabilities are aware of the assistive devices that exist and this study investigated what types of tools and devices they were using and those they wish to use.

2.10 EXPERIENCES AND PERCEPTIONS OF STUDENTS TOWARD ICT INTEGRATION

It is important to understand the experiences and perceptions of students towards ICT integration in their inclusive classroom in TVET colleges. According to SCT, students' experiences should be viewed as deriving from the bi-directional influence that occurs between personal, behaviour and social/environment factors. The

knowledge of students' experiences will contribute in formulation of guidelines that would assist lecturers and institutions to achieve the two key objectives stipulated in White Paper for Post-School Education and Training (WPPSET) which are to develop the quality of teaching and learning, and improve student support services (DHET, 2013b). With the dearth of literature on students' experiences and perceptions of ICT in SA TVET, this section explores the experiences and perceptions of students in other countries and other education settings, such as schools. The experiences and challenges faced by students and teachers in developed countries were not the same as those experienced by students and teachers in developing countries (Mbodila et al., 2013). Ndlovu and Moll (2016) explained that ICT pedagogical integration means transforming the learning experience of students from stagnant to fulfilling.

ICT integration for teaching and learning purpose in SA education context has been minimal with few technology tools being used by students despite its beneficial factors (Makura, 2014). The students' experiences and perceptions were limited and influenced by the type of technology they were exposed to and used. According to Padayachee (2017), some students used technology to play games. Search engines were viewed by students as experiential tools but teachers viewed them as a means of obtaining images and videos to share in the classroom with students. Moreover, the findings showed that some educators in SA had no clear vision with regard to incorporating ICT tools into pedagogy but preferred technologies that were related to content over pedagogical technology. Some teachers used ICT to communicate with students with applications such as WhatsApp (Padayachee, 2017). If educators had no vision of incorporating ICT tools for pedagogical purpose, yet the selection of ICT tools be used in the classroom is left to teachers to decide, this surely deprives the students an experience to be exposed to a variety of tools that can make their learning fulfilling.

ICT integration was more than just putting technology in the hands of the students (Tamim et al., 2015) and ICT alone could not improve the learning experience and opportunity for students but teachers who used ICT effectively did (Mbodila et al., 2013). Benin and Murray (2013) argued that Prensky's (2001a; 2001b) concept of 'digital natives' and 'digital immigrants' convinced professionals in the education

setting to believe that today's students think and learn in ways that are different because of ICT but there was not enough empirical evidence to support this conjecture. In a study conducted in Ireland, Benin and Murray (2013) concluded that even though all participants (students and teachers) used many of the same technologies, they differed in the type of activities they undertook and their concerns; for example, some students' idea of using technology for language acquisition was stimulating but not essential. Ramorola (2018), and Blackburn (2018) agreed that there was a digital divide between 'digital natives' referring to students and 'digital immigrants' referring to teachers. Ramorola (2018) stated that the findings of a study conducted in Mamelodi, Tshwane, indicated that when provided with technological resources, children could teach themselves and that peer learning, collaborative learning and discovery learning were important. This study investigated the perceptions of TVET students about the digital divide and the role that teachers play in their inclusive-ICT-integrating classroom.

Students become active learners if there is appropriate mediation between the student and the technology being used and support from the teacher (Addam, 2014). Today's students use TV, video games, smartphones, tablets and are often on social media such as WhatsApp, Facebook, Instagram and Twitter (Ncube, 2018). There is both a positive and negative side to using ICT in the classroom. Ncube (2018) observed that the negative side included the behaviour of students when teachers switched to using the smartboard and instructed learners to take out their tablets; for example, noise was triggered and indiscipline was observed. In addition, some learners were caught using social networks during lesson time, while others deleted learning content to create space for music, videos and pictures. However, their concerns included theft of personal items like tablets, cell phones and USBs (Ncube, 2018). Many students admitted to using the internet to research additional information and to understand concepts; some students stated that ICT saved time; for example, when learning mathematics, computer software could perform complex calculations more quickly (Addam, 2014). According to Buabeng-Andoh and Issifu (2015), students' positive attitude towards ICT directly influenced usage in a positive way.

2.11 INFLUENCE OF ICT INTEGRATION ON STUDENTS' ACADEMIC PERFORMANCE

In defining academic performance, the views of different scholars (Abubakar et al., 2018; Basri, et al., 2018; Cockrell, 2016; Masud et al., 2019) are combined to give a clear picture. Students' academic performance refers to an outcome or judgement of an assessment conducted to determine the level of accomplishments made by evaluating students' ability to acquire competencies and achieve learning objectives that lead to graduation. Improvements made to the students' state of knowledge and skills, modification of their personalities and academic growth are usually reflected on their academic reports. These accomplishments are measured against the predetermined known standards of accuracy, completeness, cost, speed, effectiveness, efficiency and productivity when using the available resources (Abubakar et al., 2018; Basri, et al., 2018; Cockrell, 2016; Masud et al., 2019). According to Lamas (2015), academic performance is a complex issue that involves a variety of factors such as intellectual level, personality, motivation, interests, skills, study habits, self-esteem and teacher-student relationships which lead to achieving an educational goal (learning) and can be achieved by behaviour modification, addressing cognitive and structural elements and accommodating learning styles and learning approaches. Studies attested that ICT integration enhanced academic performance of the students; even though these studies focused on the teachers' views (Ncube, 2018; Mukhari, 2016; Ndlovu 2015), on students' in other countries (Ali, 2017; Basri, et al., 2018) or at school level (Addam, 2014; Ncube, 2018) with little research conducted on TVET students. The current study aimed to find out from the TVET students in SA whether ICT enhanced their academic performance or not. According to Addam (2014), ICT integration encouraged interaction and cooperation among students, increased students' engagement, promoted a thematic and integrative approach to teaching and learning and developed students' creative learning capabilities. ICT supports thematic approach by providing tools for communication, research and presentation, the ability to incorporate information, images animation and a variety of quizzes to maintain students' interest; and it supplements traditional tools and practices such as a classroom discussion, audiovisual aids, pencil and paper because it is an approach in which a single context or group of closely related themes form a basis of a unit of learning

(Saraswathi & Leo Stanley, 2018). Basri, et al. (2018) stated that ICT was a major booster of academic performance when used for activities such as searching for information on the internet, connecting and communicating with other students via social media, facilitating discussions and getting feedback on academic matters from lecturers and classmates because these activities were imperative in improving study, knowledge and research skills. In addition, the study conducted by Basri et al. (2018) revealed that ICT required students to concentrate in class and those who scored higher in the grades were more interested in ICT than those who scored lower.

According to Sikhwari et al. (2015), South African HE institutions' priority was improving throughput, graduation and retention of students but the pass rates kept declining. In investigating the factors that affected academic performance for students in South African HE, Sikhwari et al. (2015) listed lecturers' personal attributes and lecturing style, the type of assessments that lecturers chose to give to students and methods used to give feedback, subject content and how it was presented to students, including the strategies used to present it, language and social and emotional demands. Other factors that influenced academic performance included socio-economic status, students' level of motivation and temperaments, peers and parental support (Masud, et al., 2019) and students' personality traits, class attendance and social network structures (Kassarnig et al., 2018). In TVET colleges in SA, lecturers were assumed to have content knowledge of the subjects they were teaching (e.g., their specific trade or vocation) including knowledge of tools and technology of the industry and the effective integration of ICT depended on the professional knowledge, beliefs, pedagogical and technological knowledge that lecturers possessed (Naiker & Makgato, 2017). This research investigated students' perceptions on the role of ICT in their academic performance.

2.12 CHALLENGES OF ICT INTEGRATION

Even though the main policy documents that guided ICT in education in SA, e-Education policy was launched in 2004, there were still challenges that hindered effective ICT integration because the policy was not explicit. Ndlovu (2015) stated that there was inconsistency in implementation, usage and understanding of the policy in SA. The e-education policy did not state or identify the type of technology

that should be used by teachers and students in the classroom for teaching and learning. Each institution and teacher selected what they were comfortable with and could afford based on their budgets, hence the inconsistency (Padayachee, 2017; DoE, 2004). In the development of administrative systems in institutions, the e-Education policy had made significant strides, but it had fallen short in achieving its main goal of providing modern technology to institutions of learning to enhance quality of teaching and learning in the classroom (DoE, 2004; Vandeyar, 2015).

Guidelines for Teachers Training and Professional Development in ICT and Training identified skills and knowledge of ICT including values and attitudes towards ICT required from teachers for effective integration of ICT in the classroom; however, they failed to clearly define the roles and responsibilities of all stakeholders involved in the education system (DoE, 2007; Vandeyar, 2015). In addition to poor policy implementation, there was a lack of connection between theory and practice which contributed to challenges in ICT integration (Mukhari, 2016). It was in 2018 when Professional Development Framework for Digital Learning: Building educator competencies in facilitating learning with digital tools and resources, was launched to provide guidelines for professional development, to ensure competent educators who “use ICTs to enhance teaching and learning”, and to guide management and support staff to facilitate the development of educator digital learning competencies (DBE, 2018, p.9). The activities to be led by DHET according to the framework include supporting development of lecturers to integrate digital technologies in teaching and support research on digital learning at tertiary institutions (DBE, 2018). It is clear that more insight is needed which is why this study investigate the challenges.

According to Padayachee (2017), there is a need for a deeper understanding of how ICT can be used to facilitate pedagogy and content knowledge and what type of technology is required in the classroom to enhance teaching and learning. ICT could be a disruption in the classroom if not used correctly with a well thought out and prepared lesson (Ncube, 2018). For successful integration of ICT in TVET colleges, early integration at school level seems imperative to ensure that students develop digital literacy for their ongoing education (UNESCO, 2015). However, many TVET students interact with ICT for the first time when they start attending TVET colleges in SA. According to Prensky (2001a), since many teachers are digital immigrants,

they find it hard to believe that learning can be fun and that students could learn from watching TV or using other technology tools. Teachers did not want to adjust their methods and strategies for teaching. Such a mentality affected pedagogy and delayed ICT integration. According to Tamim et al. (2015), pedagogy is very important in the successful integration of ICT and many institutions focused more on the technical aspects rather than the pedagogical and theoretical framework.

Teachers' lack of ICT skills, low levels of ICT proficiency, inadequate training, negative attitudes and poor teacher confidence hindered ICT integration (Mukhari, 2016). Ali (2017) stated that there was a gap between the students' expectations and the teachers' ICT competency in classrooms. Self-efficacy in teachers was imperative in using ICT in their classroom and teachers with high perceived self-efficacy approach difficult tasks as challenges to be mastered (Bandura, 1999; Blackburn, 2018) and teachers who lacked self-efficacy struggled to create inclusive-ICT-integrating environments. According to Msila (2015), successful integration of ICT in the classroom depended on the competency of teachers and their positive attitudes towards ICT. Since teachers were the ones who chose ICT tools to be used, those with high self-efficacy used it with ease and those with lack of self-efficacy experienced anxiety and frustration (Nkula & Krauss, 2014).

Shortage of resources and poor infrastructure like electricity cuts known as 'load shedding' in SA, detracted from effective ICT integration. Moreover, all ICT tools required electricity to operate even though tools like laptops, tablets and smart phones that most students were exposed to were rechargeable. In addition, Covid-19 made it difficult for teaching and learning activities to continue for TVET students because they did not have personal ICT tools at home. Many students were not able to afford their own tools and relied on the tools available at the institutions. Prensky (2001a) stated that students from K–College in the USA had grown up in homes where they had access to ICT tools but the case was different for South African students. Mukhari (2016) listed a number of challenges such as inadequate ICT infrastructure, and a lack of ICT leadership, funds and technical support. According to Van der Poll (2014) and Mkhize (2011), barriers to ICT integration in South African TVET colleges included limited funding from the government, poverty in the communities, restricted ICT infrastructure due to high costs, low bandwidth speed and lack of ICT knowledge. This view was supported by Kilfoil (2015) who stated that

technology infrastructure such as unstable electricity, low broadband, limited access to smartphones and laptops for teachers and students in SA were detrimental to ICT integration.

Using ICT in the classroom requires time for educators to set up and prepare lessons that integrate ICT as a practical tool. The time allocated to each lesson in a classroom environment makes it difficult for many educators to use technology effectively. According to Padayachee (2017) and Assan and Thomas (2012), ICT is a time-bound tool and there is limited time for each lesson. Ali (2017) indicated that time constraints were a barrier to ICT integration, including shortage of time for teachers to attend training on how to use ICT. Teachers felt that they were already overloaded with teaching requirements and had no time to adapt the lesson plans and had limited time to interact with students, especially in those institutions where interactions could only happen in the classroom with no online teaching and learning (Ali, 2017).

In SA, the language of teaching and learning for many subjects is English and many students including those in TVET colleges are struggling with the language. Mbodila et al. (2013) stated that English was a barrier in integrating ICT in countries where English was not the first language, such as India and Pakistan. English is not the first language for many citizens in SA which has 12 official languages, including 11 vernacular languages and sign language. About 80% of the content that can be accessed on the internet such as applications used in technology tools or the manuals with instructions on how to use the technology tool is in English (Mbodila, et al., 2013).

According to Nel et al. (2016), in SA, most learners come to school with a well-established Basic Interpersonal Communication Skills (BICS) in their mother-tongue which can be any of the 11 spoken languages. These learners are assisted to develop Cognitive Academic Language Proficiency (CALP) in the language of teaching and learning which is English, but for most learners, it is the second language which could be a barrier to learning regardless of the subject. Teachers and students who did not feel competent and comfortable using English could avoid using ICT tools for educational purposes. According to Donald et al. (2014), educational psychology has presented uncontested understanding that language,

thinking and learning are related and students who were forced to learn in a language in which they felt inadequate and incompetent could doubt their abilities and lose confidence. Approximately 90% of TVET college students in SA are black with diverse cultures and diverse languages but were taught in English which was not their home language which negatively impacted their academic performance (Papier, 2018) and subsequently the integration of ICT.

2.13 BENEFITS OF ICT INTEGRATION

One of SA's goals is to see all its citizens well-equipped to participate in the global activities using ICT. Businesses, governments and society are increasingly recognising ICT as an imperative tool for transformation and inclusion and SA is no exception (Manda & Backhouse, 2017). The benefits of ICT integration pointed out in the e-Education policy in SA include, but are not limited to, "the creation of new models for teaching and learning that enhance human development and cognitive skills such as problem-solving skills, higher-order thinking skills, reasoning and creative thinking; shifting educational goals; changing pedagogy to new, exciting and engaging ways of teaching to discourage traditional methods of rote learning; and increasing access to learning opportunities which promotes lifelong learning for all and accommodate different learning styles, thereby removing barriers to learning for students with disabilities" (DoE, 2004, p.16).

The findings of a study by Mukhari (2016) conducted on teachers' experience of Information Communication and Technology use for Teaching and Learning in Urban Schools indicated that benefits of ICT integration included enabling better methodological strategies, greater collaboration among the teachers, improved access to information needed for lessons and ability to accommodate students with different learning styles, different levels of understanding and different potential in an inclusive classroom environment.

According to Ncube (2018), audio-visual technology such as videos and coloured pictures found on the internet had the power to bring real-world examples into the classroom. Ndlovu and Moll (2016) stated that ICT integration improved the learning experience for students because ICT tools were more versatile than other methods and offered a wide range of multimodal texts and media forms. Dela Rosa (2016) stated that the internet and the increase in computer-mediated communication

enhanced and reshaped the use of technology for language learning. According to Blackburn (2018), technology integration in the classroom enhanced language and literacy skills for students with dyslexia.

Other benefits highlighted by different researchers (Ali, 2017; Van der Poll, 2014; Blackburn, 2018; Ramorola, 2014; Padayachee, 2017) included key issues such as sharing of resources in the learning environment by students and collaboration among students; improvement in engagement, participation and knowledge retention by students; development of ICT capabilities; easy access to information if the classroom has internet connection; stimulating interest of learners and educators; interaction between teachers and learners that was not bound by time and place; easy submission of tasks by students and quick feedback from teachers to students; and independence and improved academic performance for students, creating independence and self-efficacy for student living with disabilities and equipped learners with survival skills. The current research investigates the views of students on the benefits of ICT integration.

2.14 GUIDELINES TO IMPROVE ICT INTEGRATION IN THE CLASSROOM

The classroom is a sociocultural setting with its own culture, values, norms, practices and patterns of functioning where different individuals interact, share cultural beliefs and learn from each other (Donald et al., 2014). This means that classroom practice is guided by concepts of social practice and cognitive aspects. According to Social Cognitive Theory (Bandura, 1999), the concepts underpinning social practices have implications for how knowledge is gained and applied; and this affects which human potentialities are cultivated and whether the efforts at changes are directed at psychosocial, biological or sociostructural factors.

Padayachee (2017) stated that it was imperative for the education sector to establish links between the use of ICT in the classroom and learning goals. The Department of Basic Education's 'Action Plan to 2019: Towards the Realisation of Schooling 2030', stipulated that there was lack of evidence that clearly indicated types of technologies effective for teaching and learning processes (DBE, 2015). Technological Pedagogical and Content Knowledge (TPACK) could provide a crucial framework for training South African teachers to overcome their ICT skill challenges (Mukhari, 2016). Lecturers mostly use data projectors in collaboration with the Microsoft

PowerPoint application and internet browsers to present lessons to the students (Van der Poll, 2014). This study investigates the views of the students on the types of ICT that are useful for them in the classroom and the pedagogical strategies of ICT integration that are effective for them.

2.15 THEORETICAL FRAMEWORK: SOCIAL COGNITIVE THEORY

The theoretical framework on which this study is based is Bandura's Social Cognitive Theory (SCT) (1986) which expanded from what used to be known as Social Learning Theory (1977). Cohen, Manion and Morrison (2007) described theory as a rational complex system of belief built by scientists to explain human behaviour, has considerable explanatory and predictive potential and should be able to respond to observed anomalies, among other things. According to Bandura (1999), a theory should not only explain the behaviour of people but should be able to explain in detail how individuals acquire the competencies, attitudes, values and the emotional intelligence to make the choices leading to their behaviour.

SCT is a theory in psychology with a broad spectrum and can be used as a framework for both teachers and students to describe human behaviour in acquiring knowledge, interpret the experiences and views of students and predict future behaviour to enhance teaching and learning. SCT is a dynamic system that explains human adaptation, learning and motivation and is used to understand and predict individual and group behaviour; to identify methods in which behaviour could be changed; and to draft interventions aimed at personality development (Woolfolk, 2014). In the educational context, teachers are challenged to improve the academic performance and confidence of the students and students are under pressure to obtain the academic results that are acceptable to graduate and acquire skills and knowledge to be employable. Since teachers play a central role in ensuring that students achieve optimally, it is critical that they commit to successful learning of all students including those experiencing barriers to learning (Nel et al., 2016). In this study, SCT is used to explain the personal factors of students, the experiences of students in an inclusive-ICT-integrating classroom, their current behaviour and predicted future behaviour. The broad spectrum of SCT highlights the importance of social settings, the human agentic perspective, observation and modelling, triadic reciprocal causation and five fundamental capabilities in human behaviour (Bandura,

1986 and 1989). These aspects assisted in understanding students' experiences and predicting the future in discussing the findings in Chapter 5 of this study.

2.15.1 Triadic Reciprocal Causation

In the system of reciprocal causation, behaviour, cognition and other personal factors and environmental factors all operate as interacting determinants that influence each other bidirectionally (Bandura, 1989). According to SCT, one's behaviour influences and is influenced by personal, environmental and behavioural factors (Woolfolk, 2014). In this study (as shown in Figure 1), this theory assisted in answering the research questions and showcasing the reciprocal process that explained students' experiences; helped in interpreting the voices of students and understanding the bidirectional causation and influences and predicted the required changes based on overall students' experiences.

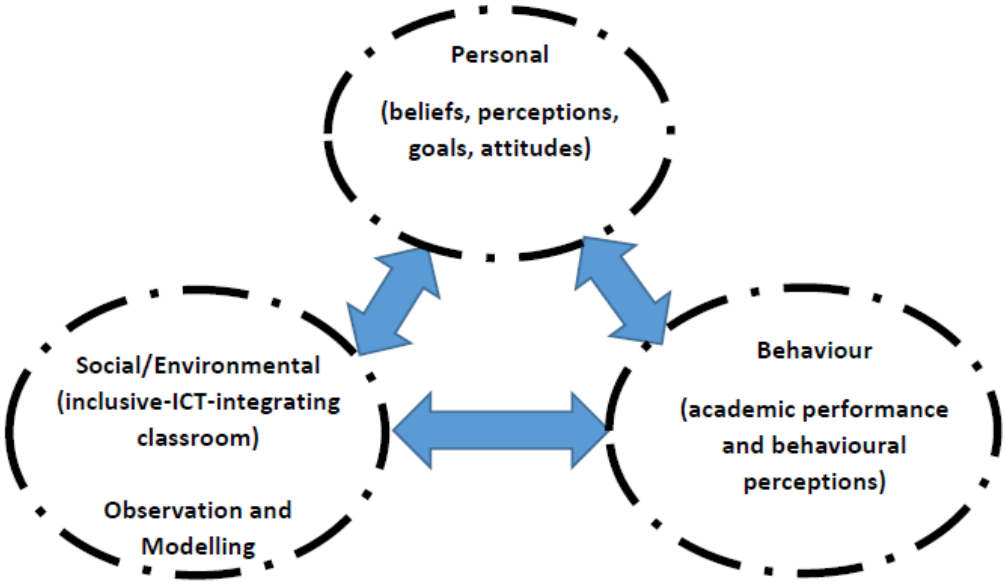

Figure 2.1.: Theoretical framework adapted from Social Cognitive Theory of Mass Communication (Bandura, 2001)

According to Woolfolk (2014), learning is the process that results in deliberate or unintentional permanent change in an individual's knowledge, skills and behaviour. This means that if learning is effective, there should be a change in knowledge, skills and behaviour. In the educational context, assessments are used to test if learning was effective or not and the results obtained through these assessments are known

as academic performance. Mir and Shakeel (2019) stated that ICT has been a big part of teaching and learning in HE in many countries with many students at this level of education surrounded by technologies like smartphones and laptops. Nel et al. (2016) indicated that no classroom was homogeneous because students were diverse and that there were many factors that influenced learning for these students.

In the current study, an inclusive-ICT-integrating classroom accommodated a diverse group of students living with and without disabilities, and used ICT for teaching and learning purpose. Social interaction among students and lecturers using ICT as a tool in and out of the classroom; students' new behaviour patterns because of ICT usage and students' personal perceptions of ICT integration were investigated.

In SCT, individuals function as contributors to their own motivation, behaviour, and development within a triadic reciprocal causation structure that involves a dynamic interplay among personal, behavioural and environmental influences (Bandura, 1999). According to Bandura (1999), cognitive processes are not only emergent brain activities but they wield a determinative influence. Furthermore, the human mind is creative, generative, proactive and self-reflective not just reactive. It is through cognitive processes that human beings are able to construct thoughts about future courses of action to accommodate and suit ever-changing situations, assess their likely functional value, organise and deploy strategically the selected options and evaluate the adequacy of their thinking based on the effects their actions produce (Bandura, 1999). SCT was used as a lens through which students' experiences were understood and explained.

2.15.1 SCT in Students' Personal Factors

SCT's view is that people are agentic operators in their life course not just observers who act as hosts of internal mechanisms created by environmental events. They are able to perceive and feel things that they are experiencing instead of becoming passive participants in experiences. Their agentic actions in exploring, manipulating and influencing the environment are more than simply exposure to stimulation, and by regulating their own motivation and the activities they pursue, people produce the experiences that form the neurobiological substrate of symbolic, social, psychomotor and other skills (Bandura, 1999).

2.15.1.1 Agentic perspective

According to Bandura (2001), to be an agent is to intentionally make things happen by one's actions. Cognitive processes are not merely emergent brain activities but they wield determinative influence (Bandura, 1999). It is therefore important for people to know and understand their own cognitive process because of the important role it plays in learning which is referred to as metacognition. Woolfolk (2014, p.280) described metacognition as "knowledge about our own thinking processes" which includes declarative knowledge that students could have about knowing what to do which influences their learning and memory, strategies, skills, and resources to perform the task; procedural knowledge or knowing how to use the strategies or follow instructions; and self-regulatory knowledge for students to apply to strategies independently and complete the task set. SCT states that the human mind is generative, creative, proactive and self-reflective not just reactive (Bandura, 1999). There are three modes of human agency: direct personal agency (individuals judge the correctness of their predictive, operative thinking or cognitive, motivation, affective and choices against the outcomes of their actions); proxy agency (the effects that other people's actions produce); and collective agency (what others believe, deductions from established knowledge and what necessarily follows from it) play an important role in development including learning (Bandura, 2001).

According to Woolfolk (2014), learning can still occur through alternative means because students can learn in multiple ways. The following points need to be borne in mind: students have different modes of processing what they are learning because of different cognitive functions; active environments with flexible and engaging instructional strategies support learning because of the brain plasticity; some learning disorders have a neurological basis, so testing, diagnosing and treating these disorders is important; teachers must be patient, compassionate and consistence in teaching; and real-life problems and concrete experiences help students construct knowledge and provide pathways for learning and retrieving information Woolfolk (2014). At college level, students are in the formal operations stage according to the four cognitive development stages of Piaget; and their thinking is scientific. They are able to solve problems in a logical manner and they do not have to experience every situation concretely but can imagine the situations (Woolfolk, 2014). According to Bandura (1999), for individuals to make their way

successfully through a complex world, they need to make sound judgements about their capabilities, anticipate the probable effects of different events and actions, ascertain sociostructural opportunities and constraints and regulate their behaviour accordingly. It is important for both students and teachers to understand their metacognition for teaching and learning to be enhanced and to make a decision about which ICT tools they need, and how to use those ICT tools and strategies to enhance their learning and academic performance. Hence, understanding students' agentic perspective is imperative.

2.15.1.2 Five fundamental capabilities

It has been established that people are contributors to their own motivation, behaviour and development within a complex system of reciprocally interacting influences (Bandura, 1999). They are characterised by five fundamental capabilities which vary in their psychobiologic origins and in the experiential conditions needed to enhance and sustain them (Bandura,1989). Bandura (1989) posited that diversity in social practices produced substantial individual differences in the capabilities that were cultivated and those that remained underdeveloped. Most patterns of human behaviour are organised by individual experiences and retained in neural codes rather than having been provided ready-made by inborn programming (Bandura, 1999). In this study, students' development encompassed many factors including their sociocultural backgrounds and cognitive processes. It was important to discover if students understood their capabilities so that they could contribute meaningfully to their learning in the classroom environment. These capabilities are:

- Symbolising capability - Individuals use symbols to transform experiences into cognitive factors that guide their reasoning and actions and by symbolising their experiences, they give structure, meaning, and continuity to their lives (Bandura, 1999). The study investigated whether students formed symbols like images in their minds, stored information to recall later and used it to guide future behaviour, had foresight to make informed decisions about what was important and then directed their behaviour. For example, if were they able to form mental pictures about the usefulness of ICT in their future, their attitude towards ICT would have changed.

- Vicarious capability – Individuals learn in two ways, either by experiencing the actions and the consequences of those actions or by observing the actions and consequences of those actions from others. Vicarious capability means that humans are capable of learning new skills and behaviours without experiencing them directly which reduces the trial-and-error method which could be disastrous (Bandura, 1999). Students' vicarious capabilities were investigated in this study.

- Forethought capability – According to SCT, individuals anticipate the consequences of their actions, set goals and plan their lives to achieve the outcomes they desire: this capability is called forethought. In exercising forethought, individuals motivate themselves and select their actions in anticipation of expected outcomes (Bandura, 1999). Patterns of behaviour that yield positive outcomes are easily copied and used but those that produce negative or unwanted results are discarded (Bandura, 1999). During observational learning, the observer of the model anticipates experiencing an outcome similar to the one illustrated by the model being observed (Bandura, 1999). This is how the behaviour is copied and anticipation of results is formed. ICT like computers can serve as a tool to enhance the ability of people to achieve the desired outcomes (Bandura, 1999). In this study, students shared what they anticipated would be the outcome of ICT integration in their lives.

- Self-regulatory capability – This enables individuals to exercise control over their thoughts, feelings, actions and behaviour and to regulate their motivation and outcomes (Bandura, 1999). Students at TVET colleges are regarded as adults who are above the age of 18 and are, therefore, able to regulate their own lives, motivation and behaviour. In order for people to influence their motivation, they need to pay attention to their thought processes and performance including the conditions under which they occur and the effects they produce. Achieving the desired results of the set standards makes individuals set higher standards for themselves (Bandura, 1999). It is important to understand how students self-regulated their learning, stayed motivated, paid attention, performed in their classrooms and the results they produced when using ICT. Self-regulation for students means that they need to be knowledgeable about themselves and how

they learn best and, to stay motivated, they need to understand why they are studying (Woolfolk, 2014).

- Self-reflective capability – Individuals are capable of self-examining their cognitive, affective and behaviour functioning and then judging from the results the accuracy and functional value of their thinking. They can then attempt to improve if necessary. Self-reflective thoughts are influenced by their experiences (Bandura, 1999). For example, the judgement that students make about their self-efficacy based on attainment of performance depends on their interpretive biases, the difficulty of the task, hard work, how much help they receive, the conditions under which they need to perform and their emotional and physical state at the time (Bandura, 1999). In this study, ICT is seen as a remedial tool that students could use to assist themselves with the knowledge, skills and strategies that they need to perform to the level they desired and then to reflect on that performance.

2.15.2 SCT IN INCLUSIVE-ICT-INTEGRATING CLASSROOM

2.15.2.1 Social setting

Even though learning is a cognitive process, social settings are important for learning to take place as they create an opportunity for individuals to observe others and learn from their actions and consequences of those actions (Bandura, 1977). An individual's social setting covers all aspects of how individuals think, feel, behave and develop and is inextricably connected to the social groups, forces and relationships that form part of their environment, such as families, schools or classrooms (Donald, et al., 2014). Whatever the social conditions might be and the everyday activities that bring individuals into fortuitous contact with different types of people, psychology can provide the basis for predicting the nature, scope and strength of the impact that such encounters will have on human lives (Bandura, 1989). In an inclusive teaching and learning process, teachers are expected to create a classroom environment that is welcoming, caring, supportive and non-judgemental, where all students feel included whether they are living with a disability or not. At the same time, it is important to take into consideration the dynamics of a diverse classroom environment and not focus on what students cannot do but rather on how these diversities can be used to unlock learning opportunities that can

ensure successful learning experience for all learners (Nel, et al., 2016). Exploring the students' experiences gave insight into their social settings and how learning took place for them which could be used in the formulation of guidelines for ICT integration.

2.15.2.2 Observation and modelling stimuli

Another important principle of SCT is that learning takes place through observation and modelling stimuli; for example, students observe actions of a role model who can be the teacher or peer in the classroom context (Bandura, 1977; Woolfolk, 2014). Bandura (1989) stated that there are four critical elements in learning by observation and these elements are:

- Attention – the role of students is to pay attention while teachers are challenged to be knowledgeable and highly competent in demonstrating or presenting a subject, in using ICT tools selected and in capturing the attention of all students while keeping in mind their diversity;
- Retention – in order for students to imitate the behaviour learned when they were paying attention, they must be able to remember it and be able to recall it when needed which requires teachers to repeat the actions or behaviour;
- Production – once the students know what a behaviour looks like and remember how to perform it, they are expected to produce it with ease. For example, if a teacher demonstrates how students can save their typed work on the computer and how they can retrieve the typed work, the students are expected to recall the steps and perform them on their own; and
- Motivation and Reinforcement – new behaviour or new skills need to be used. Bandura cited in Woolfolk (2014) posited that individuals might choose not to use the acquired behaviour or skill unless they are motivated either through being given an incentive for using it or reinforcement.

Based on this theory, the study investigated what students observed and copied from role models (teacher and peers), and whether it changed their behaviour.

2.15.3 SCT in Academic Performance and Behavioural Perceptions

It has been established that in terms of SCT, there is a bidirectional influence between behaviour, personal and the environmental factors (Bandura, 1999). For example, if students perform well academically, their personal factors such as self-beliefs, aspirations, goals, cognitive processes, emotions, thoughts, and outcome expectations that regulate behaviour are positively influenced; in addition, they influence their environment by modelling behaviour that their peers could observe and copy. In contrast, if students perform badly in their academic life, they could be negative towards school and destructive in the classroom. Zhou and Brown (2017) explained the importance of outcome expectancies by elaborating that for individuals to learn a particular behaviour, they must understand what the potential outcome is going to be if they repeat the behaviour. In teaching and learning, the expected outcome is academic performance and lifelong use of the skills acquired. If students use ICT in their learning and achieve excellent academic performance, other students would observe and copy the behaviour and also expect the outcome to be good academic performance. Moreover, the students who are using ICT would continue using ICT which would lead to even better performance.

According to Prensky (2009), students must be guided to develop digital wisdom which can be learned and taught. In addition, being digitally wise involves not only using technology to enhance natural capabilities, such as thinking and understanding, but continuously identifying areas where human capabilities, even those that are well developed, could not function without technology (Prensky, 2009).

This study investigates behavioural perceptions of students selected to find out whether they were digitally wise or not. Prensky (2009) described individuals with digital wisdom as those using technology for almost all activities in all aspects of their life. Through the lens of SCT, for example, an anticipated prediction could be that students would feel not ready if they forgot to charge their technology tools and were not able to use them. This would then influence them to ensure that there are ways for them to charge their tools. If they observed others carrying chargers, they might also copy this behaviour and bring their chargers into the classroom. Mthelebofu (2018) suggested that learners model what they observe and experience which means that if students are not exposed to models (teachers and peers) who are

using technology, they would not copy the behaviour. College students who were not exposed to ICT in lower level of their schooling life might suffer from proactive interference because they are used to printed text (Nishizaki, 2014). In an article published on digital wisdom, Prensky acknowledged that ‘digital immigrants’ and ‘digital natives’ would be irrelevant terms in the 4IR because both teachers and students would have acquired the knowledge and skills of using technology (Prensky, 2009). Zhou and Brown (2017) further stated that it is the duty of teachers to teach students that when a behaviour has been learned successfully, the outcome will be meaningful and valuable to them.

According to Bandura (1999), outcomes exert their influence through forethought and, therefore, have little or no impact on behaviour until individuals understand the connection between outcomes and actions in their environment. Students see ICT as more than just a tool but as foundation for life and education, as well as a way to master everyday skills that lead to self-efficacy (Blackburn, 2018). Bandura (1999) believed that individuals with self-efficacy see difficult tasks as challenges to be mastered. This means once students have developed self-efficacy in ICT, tasks related to their studies are approached as challenges to be mastered, new behavioural perceptions are formed and students’ academic performance improves. When ICT becomes an integral part of daily professional and productivity routines, teaching and learning approaches change from being teacher-centred to student-centred (Addam, 2014).

2.16 CHAPTER SUMMARY

This literature review chapter has highlighted the important role that ICT plays in the lives of students in the education context. It has shown that teachers’ perceptions and attitudes toward ICT play an important role in effective integration of ICT to accommodate all students whether living with disabilities or not. The topic of students’ experiences with ICT integration in SA has been under-researched, especially for TVET college students. However, the literature from other contexts, settings and countries has painted a clear picture of the benefits, challenges and impact of ICT on academic performance of students. SCT as theoretical framework was used to guide this research and assist in interpreting the findings. The next

chapter presents the research design and methodology used in conducting the empirical research.

CHAPTER 3:

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

This chapter outlines the research design that was chosen and method used in this study. It gives details of the processes that were followed to gain entry to the research site and provides information about participants as well as the criteria that were used to select them. It describes the techniques, instruments and procedures used for data gathering, the methods selected for data analysis and the ethical issues that were considered and adhered to.

3.2 RESEARCH PARADIGM

The research paradigm for this study was interpretivism which posits that reality is subjective, individually constructed and differs from person to person (Scotland, 2012). De Vos et al. (2011) stated that the interpretivism requires a researcher to use a different method to reach an interpretative understanding and explanation in order to appreciate the subjective meaning of what participants say. Chilisa and Kawulich (2012) asserted that the appropriate research paradigm is based on researchers' views of what is real, what they know, how they know it, theoretical perspectives they have about the topic being studied, the literature that exists on the topic and their own value and ethical system. Denzin and Lincoln (2018) mentioned that ontological, epistemological and methodological beliefs shape how the researcher sees the world. The ontological assumption of the researcher with an interpretivist belief is that there is no single reality but reality is socially constructed (Creswell & Creswell, 2018) and these multiple realities can be explored and meaning can be obtained through interaction between the researcher and participants about the phenomenon being studied while collecting data using techniques such as interviews (Kivunja & Kuyini, 2017).

As the researcher for this study, my belief was that there were multiple realities regarding the way students experienced ICT integration in their inclusive classrooms at TVET colleges; hence, this study was underpinned by interpretivism. Instead of starting with a hypothesis as in postpositivism, in interpretivism the researcher inductively develops a pattern of meaning by interpreting the meanings that others

have of the world (Creswell & Creswell, 2018). Scotland (2012) mentioned that using the interpretivist paradigm assists in gaining insight and understanding of participants' behaviour and perspectives. Since this study aimed to understand the knowers' (students') experiences, behaviour and perspective of the objects they use which, in this case, is ICT, the interpretivist paradigm was selected to increase the understanding of the TVET students' world view of ICT integration in their inclusive classrooms.

3.3 RESEARCH APPROACH

The research approach for this study was the qualitative approach. Qualitative research studies are defined as holistic, empirical, interpretive and emphatic (Stake, 1995). In this approach, the researcher explicitly and reflexively identifies their biases, values and personal background upfront because in this type of study the researcher's role is important and involves a sustained and intensive engagement with participants (Creswell & Creswell, 2018). Hammerberg et al. (2016) asserted that the qualitative approach is used to answer questions about experiences, meaning and perspectives from the view of the participants and includes techniques such as interviews and focus groups. In qualitative research, the researcher gives insight into the behaviour of participants and meanings and interpretation of the participants' world (De Vos et al., 2011).

3.3.1 Qualitative Research

Qualitative researchers focus on the experiences of participants, how they interact in their social context and the meaning they have for their world in those particular settings (Merriam & Grenier, 2019). Eight basic principles of qualitative research used in this research are natural setting, the researcher as key instrument, multiple sources of data, inductive and deductive data analysis; participants' meanings, emergent design, reflexivity and a holistic account (Creswell, 2014; Creswell & Creswell, 2018; McMillan & Schumacher, 2014).

The natural setting refers to a place where the participants are experiencing the issue being studied (McMillan and Schumacher, 2014). In such settings, the researcher interacts face-to-face with the participants (Creswell & Creswell, 2018) because qualitative researchers believe that behaviour is best understood where it

occurs (McMillan & Schumacher, 2014). In qualitative research empirical data is collected in natural settings with no manipulation of variable and not in laboratories or controlled environment (Cohen et al., 2007). The natural setting for this study was a TVET college in Johannesburg. According to Creswell (2009), researchers must work closely with gatekeepers in order to gain access to the community that is being studied. In this research, the gatekeepers were the ethics committee of the university, campus manager; heads of department for each programme, i.e., NCV and NATED, education specialists and the DU administrator.

The researcher is a key instrument in qualitative research as the role of the researcher is to collect the data (Creswell, 2014). In a qualitative study, the researcher is an interviewer in in-depth interviews, a facilitator for focus group discussions and the person who studies documents in order to obtain the information directly from the source (McMillan & Schumacher, 2014). I had direct interaction with the participants and documents. Researchers' skills in asking questions and collecting data are important. These skills are reflected in whether the participants see the researcher as an interested, respectful, non-judgemental person who maintains confidentiality at all times or otherwise (McMillan & Schumacher, 2014). Moreover, the researcher may be a total stranger, an outsider who is totally detached and only comes to collect data and then leaves or a complete insider who has an established role in the setting where the data will be collected (McMillan & Schumacher, 2014). My role in this study was that of an outsider and I did not participate in any activities of the institution at the time of conducting research. Researchers should attempt to neutralise their biases in gathering the information and interpreting it (Creswell & Creswell, 2018). Biases should be avoided at all costs and researchers should not pretend that they do not have a point of view but must declare their perspectives up front (Taylor et al., 2016). Researchers are key instruments in qualitative research and should take measures to minimise their biases using self-reflexivity about their goals (Tracy, 2013).

Reflexivity refers to the researcher's reflection on their personal background, culture and experiences which have the potential to impact their interpretations including the themes they derive from the data and the meaning they make of it (Creswell, 2014). According to McMillan and Schumacher (2014), researchers' relationship with the participants necessitates a description of their role and status within the group or the

site and explaining this relationship is important. According to Creswell and Creswell (2018), reflexivity requires the researchers to consider two important points, namely, past experiences and how those past experiences shape their interpretations. Creswell and Creswell (2018) also stated that reflexivity requires the researcher to note and record personal experiences during the research process and how those experiences influence the interpretation of data. As a researcher, I stipulated how my experiences influenced me to conduct this research and select the chosen site. I kept a journal during data generation, analysis and interpretation and my reflections are shared in this study.

Multiple sources of data means that qualitative researchers do not rely on one source of data but they use multiple forms such as interviews, observations, documents and audio-visual information (Creswell & Creswell, 2018). Researchers in qualitative studies believe that human behaviours are complex and in collecting data, nothing must be taken for granted, every detail must be recorded, and nothing is trivial and unimportant. Therefore, data generation should not be limited to a single source and participants' ideas should be shared freely (Creswell & Creswell, 2018; McMillan & Schumacher, 2014). In this research, the multiple sources of data were interviews, focus group, field notes and documents.

Inductive and deductive data analysis means that the researcher can choose how to analyse data. Inductive reasoning is important in qualitative research because qualitative researchers do not gather data to prove or disprove a formulated hypothesis but collect data to synthesise it and generate theory (McMillan & Schumacher, 2014). For this study, the focus was on understanding "what", "why" and "how", i.e., what students' experiences with ICT integration in their inclusive classroom are, why they experienced whatever it was that they were experiencing and how those experiences influenced their behaviour. An inductive approach was used in this study because, according to McMillan and Schumacher (2014), it assists researchers to develop the theory from bottom up, detailed particulars, and helps researchers to find new ways of understanding. In this study, I used a method described by Creswell and Creswell (2018) of working inductively and building patterns, categories and themes.

Participants' meanings are core aspects of qualitative research and in conducting this study, I gave students a voice. Thus, a few participants were selected to share their experiences on ICT integration in their inclusive classrooms. In qualitative research, the focus is on the meaning that the participants hold about the issue being studied (Creswell & Creswell, 2018). Mohajan (2018) asserted that the emphasis in qualitative research is on exploring and explaining why people think and behave the way they do, not on the numbers of people who think and behave a particular way. Therefore, the meaning that students have about ICT integration was integral to this study.

Emergent design means that the researchers' plan can change once they enter the field and start collecting data or it can change at some phase of the research process (Creswell & Creswell, 2018). There were no major adjustments in this study except the rescheduling of focus group meetings to accommodate all participants.

A holistic account refers to multiple perspectives that qualitative researchers are led to examine because they understand that the world is complex and human behaviour is a result of interaction with multiple factors. To study the issue thoroughly, they must identify the many factors involved in a situation being studied (Creswell, 2014; Creswell & Creswell, 2018; McMillan & Schumacher, 2014). The complex picture of this study was that a student's life in a TVET college follows same steps as any student enrolled in any HE institution starting with the application to enter a programme, submitting proof of previous grade/levels passed, disclosing a condition if they have a disability and registration (when accepted). Thereafter, teaching and learning takes place, assessments are conducted and the results are released. This study focused on the experiences of students during teaching and learning with much attention paid to the holistic aspect of challenges and benefits of their interaction with ICT, peers and lecturers in their inclusive classroom as well as their participation and the results that they obtain.

3.4 RESEARCH DESIGN

I had to decide and select the type of research design within the research approach chosen, which provided the specific direction for procedures that would be followed in conducting the study (Creswell & Creswell, 2018). The design appropriate for this research was a case study which is described by McMillan and Schumacher (2014)

as an in-depth analysis of a single entity. According to Stake (1995, p.2), “a case is a bounded system” while Creswell and Creswell (2018) asserted that case studies are bounded by time and activity which means they are unique according to place, time and participants’ characteristics. Yin (2018) mentioned that a case study is an empirical method that focus on in-depth which investigates the case within the boundaries of its real-world context. A case study is instrumental when it is used to gain insight and general understanding into a research question by studying a particular case (Merriam, 2009; Stake, 1995) such as this study. Denzin and Lincoln (2018) asserted that case studies rely on interviewing, observing and document analysis as data gathering techniques. In this case study, the techniques used to gather data were in-depth interview, focus group interviews, document analysis and field notes.

3.5 THE SETTING

One of the important characteristics of qualitative studies is that they are conducted in the field where the issue being investigated is experienced on the participants’ turf (McMillan & Schumacher, 2014).

3.5.1 Population and Sampling

Purposeful selection of site and participants, which can assist the researcher to understand the research problem and question, is important in qualitative research. Sample size depends on the qualitative design being used (Creswell & Creswell, 2018). Sample size in qualitative research can range from 1 to 40 or more and researchers view the sampling process as dynamic, ad hoc and phasic not static (McMillan & Schumacher, 2014). Purposive sampling is a qualitative method for sampling information-rich informants and is used to select sites and individuals whose participation in the research study help the researcher to understand the issue being investigated and answer the research questions (Creswell & Creswell, 2018; Flick, 2018). The sample “will represent a wide variation of the phenomena under study” (Tracy, 2013, p.136). This also saves time and ensures the quality and trustworthiness of data (Hammerberg et al., 2016).

For this study, the purposive sampling method was selected because it allowed for selection of information-rich participants from whom I learned a great deal about the

topic. Specific documents supplemented the data. In purposive sampling, the researcher is required to select a strategy for recruiting participants that is appropriate for the research problem and design (McMillan & Schumacher, 2014).

I requested permission from the management of the college (Appendix C) to address the students directly so that all students could understand what the research was about and also get an opportunity to ask clarity seeking questions. I was granted permission by the college management to meet NATED students and NCV students on different days because timetables for the groups were adjusted to accommodate small groups of students at college due to Covid-19 (DHET, 2020). In addition, the education specialists for different courses sent, via e-mail, copies of timetables to assist in arranging the times to see the students. I made arrangements with education specialists and the DU administrator, visited the college on the days agreed upon, adhered to Covid-19 regulations (UNISA, 2020), accompanied by the staff member arranged by the college management, addressed students and requested them to participate in the study. I explained what the research was about, handed out the letter (Appendix E) to all students who showed interest, requested them to participate voluntarily in the study and asked them to sign consent forms and a register. However, some students asked to email consent forms. My details were on the letter. I clearly explained that data would be collected using the Synchronous Computer-Mediated Communication (SCMC). I also visited the DU where some of the students living with disabilities were addressed and asked to participate voluntarily in the research.

In qualitative research, the power and logic of sampling is that the few cases studied in depth yield insight into the topic and sampling is done to increase the utility of information obtained from small samples (McMillan & Schumacher, 2014; Tracy, 2013). Sample size is determined by the purpose of the study, focus of the study, primary data generation strategy, availability of informants, redundancy of data and views of peers (McMillan & Schumacher, 2014; Merriam, 2009).

3.5.2 The Participants

A total of sixteen individuals (eight students from NATED and eight students from NCV) participated in this study. Only the students who volunteered to participate in the study were interviewed and participated in the focus group. Even though 24

students signed consent forms, only 16 students participated in the study. Some students excused themselves after signing the consent forms. Depending on the research purpose and question, it is important for the researcher to select participants who have requisite experience on the topic (Rosenthal, 2016). The students, who had studied in an ICT-integrating environment for a period of more than one year and had experience with three or more different types of technologies and software/applications (e.g., technologies like computer, smartboard, DVPs etc.; and software like MS Office, JAWS, Netop, Zoom etc.), were requested to participate in this study. At the time of the research, these students were at their exit level doing NATED N6 and NCV Level 4. Moreover, I selected students who were living with disabilities and those not diagnosed with any disability.

After communicating with the institution and receiving the timetables from the heads of department for different courses, it was clear that it would be impossible to address all students on the same day. I adjusted the plan. No data was collected from students on the days when I was addressing them to avoid being in close contact with the students; however, I used my journal to record the experience.

> *Excerpt from my journal 04/08/2020:*
>
> What an experience! Today I visited the college to meet with possible participants (students) for my research and with COVID-19 regulations it seemed like the longest day ever. The college personnel at the gate had to check my temperature and recorded it on the form in adherence to the guidelines for COVID-19. I then had to complete the DHET screening tool with my details and answer questions on the tool about my health whether I have a cough or sore throat etc. Even though I had brought my sanitiser and wearing mask, I had to be sanitised. Anyway, a former colleague was called and came to fetch me from the gate straight to the first class. Before entering the class, she went in to check if students were there but only few students were in the class. She told me that majority of students were not in class and I started panicking but she quickly told me to calm down and said that they are on the premises just not in class. She then sent a message to all students in a WhatsApp group. I stood there and witnessed the power of ICT. In less than 5 minutes, all students, NCV Level 4 came from the field and entered the

> classroom one after another, in a line, observing social distancing protocol and sanitising their hands as they enter the classroom. When all students were settled, she allowed me to come in and I had to sanitise my hands before entering the classroom. Things that COVID-19 make us do.

The DU was assisting students who had been diagnosed with visual impairment, dyslexia, epilepsy, myopia, weakness of the right side limb, cerebral palsy, attention deficit disorder, ptosis, orthopaedic, neurological and neurodevelopment disorders. The variety of assistive devices procured for these students included Zoomax Snow HD 7 inch Handheld Magnifier; Keys-U-See large print keyboard; Transformer HD OCR Wi-Fi/USB Portable Magnifier; Zoom Text Magnifier/Reader Non Enterprise Non Network 5 User Ver.2018; ACE Portable OCR Smart Reader and Magnifier; Merlin HD ultra with LCD Monitor Desktop Magnifier; Double check XL-Financial calculator with speech, Large Buttons and Display; laptops installed with JAWS application; and digital voice recorders. In order to protect the identities of the participants, it is safe to state that some students living with disabilities listed, who are using the devices and applications mentioned, participated in the study.

Four students from NATED and four from NCV participated in the focus group and four others from NATED and four from NCV participated in the individual in-depth interviews which made a total of 16 individuals. This study intended to give TVET students a voice and the general population of students at the selected TVET institution is made by NATED and NCV students who are different in terms of cognitive and academic levels but taught in the same classroom setting either by the same lecturers (one lecturer teaching both NCV and NATED students) or different lecturers (meaning NATED lecturers who do not teach NCV, or NCV lecturers who do not teach NATED). In addition, I sampled students from both programmes as part of establishing and facilitating transferability of findings (i.e., the degree to which the results can be transferred to other contexts) which will enable other researchers to judge how well the research context fits other contexts, helping them to replicate the study with similar conditions in other settings (Anney, 2014; Creswell & Creswell, 2018). Therefore, selecting students from either NCV only or NATED only would not have sufficed. Participants were then contacted to arrange the appropriate time for interviews and focus group.

3.5.3 Participants' Codes and Brief Profiles

Participants were students living disabilities and those without disability to promote inclusion which is described in Strategic Policy Framework on Disability for Post-School Education and Training System as the system of embracing diversity and allowing all individuals, regardless of disability, equal opportunities (DHET, 2018). The codes in Table 1 below were used to protect the identity of the students. The codes were formed to indicate whether the student was doing NCV or NATED. If the student was doing NCV, the code starts with NCVL4 and for NATED students the code starts with N6. The next part of the code, S1, S2, etc., represents the number that I allocated to student. There were eight NCV students and eight NATED students who participated in the study. The last part of the code indicates whether the student was an In-depth Individual Interview Participant (IIIP) or a Focus Group Participant (FGP). All students were between the ages of 20 and 30 years.

Table 3.1: *Participants' profiles*

GROUP AND LEVEL	PARTICIPANT	CODE	LIVING WITH DISABILITY	GENDER
National Certificate Vocational (NCV) - Level 4 In-depth Individual Interview Participants	Student 1	NCVL4S1-IIIP	Yes	Male
	Student 2	NCVL4S2-IIIP	Yes	Male
	Student 3	NCVL4S3-IIIP	No	Male
	Student 4	NCVL4S4-IIIP	Yes	Female
NCV - Level 4 Focus Group Participants	Student 5	NCVL4S5-FGP	Yes	Female
	Student 6	NCVL4S6-FGP	Yes	Male
	Student 7	NCVL4S7-FGP	Yes	Female
	Student 8	NCVL4S8-FGP	Yes	Male
National Accredited Technical Education Diploma (NATED)- N6 In-depth Individual Interview Participants	Student 1	N6S1-IIIIP	No	Female
	Student 2	N6S2-IIIP	No	Female
	Student 3	N6S3-IIIP	No	Female
	Student 4	N6S4-IIIP	Yes	Female
NATED - N6 Focus Group Participants	Student 5	N6S5-FGP	No	Female
	Student 6	N6S6-FGP	No	Female
	Student 7	N6S7-FGP	No	Male
	Student 8	N6S8-FGP	No	Female

3.6 DATA GENERATION TECHNIQUES

In qualitative research, data production and analysis are interwoven and occur in overlapping cycles. Multimethod strategies of collecting data are used to allow triangulation in order to compare different insights into the topic and increase the credibility of findings (Creswell & Creswell, 2018; McMillan & Schumacher, 2014). Triangulation is a strategy of joint use of multiple methods or sources of data in a research study to examine assertions and build confidence in the findings (Flick, 2018; Leavy, 2017); thus, I used several data generation techniques for this case study.

In qualitative studies, the key instrument is the researcher. Therefore, to grasp the implications of the results and conclusions and understand the credibility and potential contribution of the study, it is imperative first to understand the researcher's motivation, purpose and designs used to collect data (Salmons, 2012). In the introduction of this report, the purpose of the study and what motivated me to conduct this study was stated; this section elaborated on the techniques used to collect data and why these techniques were selected. According to Creswell and Creswell (2018), qualitative interviews are face-to-face in-depth interviews with individual participants while focus group interviews are conducted with small groups of six to eight participants in the same room or telephonically or virtually via web-based platforms. Janghorban et al. (2014) stated that advances in technology have made it possible for researchers to conduct individual interviews and focus groups while overcoming time and financial constraints, geographical dispersion and physical mobility boundaries that have adversely affected face-to-face interviews. In enhancing their qualitative research repertoire, some researchers have taken advantage of the benefits that new technologies using internet-based synchronous communication tools have provided (Redlich-Amirav & Higginbottom, 2014). This study followed this route because of social distancing imposed by the guidelines to reduce the spread of Covid-19 that disrupted the schooling process in SA and many other countries. Benefits of synchronous virtual platforms include allowing researchers an experience closest to the 'look and feel' of a face-to-face interaction, to observe and take note of nonverbal gestures through video conferencing applications (Flick, 2018) and to adhere to ethical guidelines for conducting qualitative studies during Covid-19 (UNISA, 2020). In online interviews, direct

interaction between researchers and participants happens through Computer-Mediated Communication (CMC) and closely resembles the natural back-and-forth of face-to-face communication with some ICTs allowing verbal and nonverbal communication; moreover, researchers still follow fundamental steps and thinking involved in collecting research data and then add an important dimension – technology (Salmons, 2012). In online interviews and focus groups, ethical issues are the same as in face-to-face interviews; the researcher is still able to see the participants, take notes on what participants say verbally, note their nonverbal communications and record the interview sessions to revisit later when clarity is required. However, virtual platforms give participants the right to withdraw from the interview process or focus group session just by clicking the button if they feel uncomfortable. The negative aspect is that it could result to possible [2]absentee and allow for rescheduling of interviews compared to face-to-face interviews (Janghorban et al., 2014). Online data generation methods are part of an emergent design which allow for flexible adjustments. Studies conducted using such methods must answer the research questions intended by the study and also answer questions like why and how the researcher chose the ICT used; how the participants reacted and responded to the process and interview questions; whether the researcher made any adjustments or whether the process proceeded as planned; if any adjustments had to be made, why and how they were made; what type of data was collected and if it was adequate and appropriate for the researcher to analyse and draw conclusions; and what other researchers would need to know if they want to use a similar approach (Salmons, 2012).

According to the principles of research ethics stipulated in the UNISA Covid-19 statement on Research Ethics, issued in April 2020 (UNISA 2020) following the national disaster announcement by South African President, Mr. Cyril Ramaphosa, which imposed different levels of lockdown starting with Level 5 (Presidency, 2020), no new face-to-face research studies were to be conducted for the duration of the Level 5 lockdown. It was further stated that research should be adapted to the dynamic situation on an ongoing basis (UNISA, 2020). At the time of data generation, the lockdown regulations were eased and DHET had established a plan

[2] Absentee in this context means that some people who promised to attend may not attend without prior notification

to phase in students back to universities and TVET colleges under what was regarded as the ‘new normal’; with every individual expected to practise social distancing, wear masks at all times and sanitise their hands as they entered the institutions and at other times as needed. I adapted data generation to SCMC with the aim of adhering to the embargo imposed by UNISA on researchers not to interact with participants face-to-face during lockdown. However, UNISA approved continuation of data generation for studies that did not expose participants and researchers to the risk of being infected; i.e., studies that collected data online and reviewed documents were allowed to continue. UNISA also supported the use of Microsoft Teams as a data generation platform (UNISA, 2020) and this is the application that was used to collect data in this study.

Different phases as explained by McMillan and Schumacher (2014) served as a guide in ensuring that data was collected from the planning phase until the completion phase that included data analysis and discussion of findings.

3.6.1 In-depth Interviews and Interview Setting

The semi-structured interviews with open-ended questions allowed the participants to freely share their ideas without restriction. The advantages of the individual one-on-one interviews and focus groups were that participants were able to provide historical information that assist in interpreting the behaviour; the participants were not limited by the instrument but could elaborate on their perspectives for clarity as I probed; and the use of virtual platforms created an opportunity for me, as the researcher, to observe participants’ face for nonverbal expressions (Creswell & Creswell, 2018; Denzin & Lincoln, 2018; Taylor, et al., 2016). The disadvantages of this method are that: not all participants may be able to present their ideas in English which could mean that the researcher needs to get the ideas translated; and the researcher may not observe the actions and behaviour in a natural setting (Creswell & Creswell, 2018). However, in this study, participants presented their ideas in English with minor errors while one participant mixed English and IsiZulu. In qualitative research, the in-depth interview technique is best used when the researcher is gathering data to find things that cannot be observed like feelings, thoughts and perceptions that individuals have about an issue being investigated (Tracy, 2013) and six to eight people are ideal (Creswell & Creswell, 2018).

The interview sessions were planned to be 30 to 45 minutes long but I allocated one hour for each session to ensure that there was enough time for the participants to connect on the virtual platform. All interview sessions were completed within the planned time even though there were some challenges such as connectivity due to poor bandwidth on networks and rescheduling due to load shedding. Interview questions (Appendix G) were open-ended questions that allowed for probing and were designed to give insight and understanding of the issue that was studied. This technique was selected because it allowed students to explain and elaborate on experiences by describing their feelings, thoughts and meanings they held about ICT integration.

In developing rapport with the participants, I introduced myself, explained the purpose of the research and acknowledged the receipt of signed consents from the participants. I requested each participant to acknowledge that they were aware that the interview session was being recorded and that they agreed to have the interview recorded. All participants acknowledged and agreed to the recording. The in-depth interviews were kept to the allocated time, I used MS Teams on my laptop and an external voice recorder for audio recording because the meeting recording feature on MS Teams was only available to users who were paying for the application. Since I was using the free version of the application, I could not use the recording feature of the software. The recordings were then transferred to a folder on the laptop for transcribing and storage; however, I kept the recordings on the voice recorder as backup. All interviews were transcribed verbatim into Microsoft Word (MS) immediately after each interview; however, I realised that transcribing took more days than the timeframe I had initially set and therefore I adjusted the plan. The advantages of transcribing immediately were that the responses given and the nonverbal gestures made by the participant during the interview were still fresh in my mind; I was able to determine whether there were questions that needed more clarity and noted that a follow-up interview was needed; I listened to interview sessions repeatedly during transcribing and created some codes immediately; and I knew how to adjust probing questions for the next interview. I took notes even though the sessions were recorded to safeguard the responses in case the technology used to record the interviews was not working (Creswell & Creswell, 2018).

3.6.1.1 The interview schedule

The interview protocol (Appendix G) had no initial fixed time stipulated which allowed times to be adjusted to accommodate the availability of participants when setting up appointments. Moreover, the approval from the college principal had a condition that data generation should not interfere with teaching and learning. In scheduling the interviews, I had to consider:

- The timetable of the participant for classes and ensure that interview was not scheduled at the time the student was expected to be in class;
- Access to Wi-Fi because many students preferred to use the college Wi-Fi with only a few who were comfortable with using their data or home Wi-Fi to connect on the online platform. This meant that the interview had to take place while the students were still at the college, for those who needed the college Wi-Fi to be able to connect;
- Location to avoid and minimise interference of things such as outside parties, noise levels and poor connectivity during the interview;
- The load shedding schedule to ensure that both the participant and I were not affected by scheduled power cuts;
- Storage space on the devices of the participants for them to be able to download and connect to MS Teams; and
- Camera quality and sound output of the devices of the participants to ensure that I was able to clearly see and hear the participant and vice versa.

I assisted the participants to download the MS Teams software by sending the link to each participant's email address. Downloading and connecting appeared to be easy for all participants.

3.6.1.2 The interview questions

Creswell and Creswell (2018) recommended that there should be between five and ten interview questions even though there is no definitive number that is standard for all researchers. Interview questions (Appendix G) were drafted in line with the

objectives and sub-questions listed in Chapter 1. In designing the interview questions, I used a strategy to phrase the questions in a way that was friendly and easy to answer by the participants while asking about different aspects of the phenomenon leading to answering the research question as described by Creswell and Creswell (2018). All interviews started with short questions where students selected and listed the ICT tools that they were familiar with in a short questionnaire followed by longer, open-ended questions and probing.

3.6.2 Focus Group

According to McMillan and Schumacher (2014), qualitative researchers use supplementary techniques such as focus groups, photographs and films to assist in interpreting, elaborating and corroborating data obtained from participants' in-depth interviews and documents. A focus group was used in this case study as another data generation technique. Focus groups are different from in-depth interviews because in interviews the researchers take a role of an "investigator" where they ask questions, control the dynamics of the discussion and engage in a dialogue with one individual at a time whereas in a focus group, researchers play the role of a "facilitator" or "moderator" by facilitating or moderating a group discussion between participants and not between the researcher and participants (Nyumba et al., 2018, p.21). The facilitator of a focus group should be skilled in interviewing and group dynamics and ensure that the session lasts only 1½ to 2 hours (McMillan & Schumacher, 2014) to ensure the necessary depth in the discussion but not to allow for fatigue to set in. Nyumba et al. (2018) warned researchers that long meeting sessions of focus groups might cause participants to suffer from fatigue and lose interest quickly on the discussion.

The focus group session in which the participants were college students above 18 years of age was scheduled to last for two hours. Homogeneous participants with common traits are ideal for a focus group and creating a social environment where participants are stimulated by one another's perceptions and ideas which can increase quality and richness of data (McMillan & Schumacher, 2014). The role of the researcher includes creating an environment that is comfortable for participants with minimal distractions, which allows the facilitator to also observe nonverbal gestures; however, the introduction of the internet has made it possible for an online

discussion to be created using a virtual platform (Nyumba et al., 2018). The single online focus group for this case study could have been prone to technical problems like poor or loss of connectivity. However, I wanted to see the facial expressions of the participants. To minimise challenges, I had to think and prepare for all possible challenges and planning the focus group took longer than the actual session because of the following factors:

- Time convenience for all participants – I had to arrange a convenient time for all the participants to be able to login on Microsoft Teams. This posed a huge challenge because the timetables obtained from HODs showed that the NCV programme was running in the morning from 8:00 to 13:30 and the NATED programme was running in the afternoon from 13:45 to 17:45. This meant that, while NCV students were in class, the NATED students were at home or on the way to college and vice versa. Since the approval from the principal indicated that data generation should not interfere with teaching and learning, I could not arrange a time when students would be in class. However, since I had a bigger pool of students who were willing to participate in the research study, I requested individual timetables for each student and requested each student to indicate their availability that did not clash with time to attend classes. Looking at the individual timetables, I realised that students were not attending classes every day and skipped a day depending on the course they were enrolled in. The plan was to have four students from NCV and four students from NATED to ensure that both programmes were represented in the focus group. In addition, I planned to have students living with disabilities and students living without any diagnosed disability in the focus group.

- Access to internet service – I needed to establish whether the students preferred connecting while they were at the college or had means to connect while they were in the comfort of their own homes. Connecting at the college posed another challenge because during the interview, many students alluded to the fact that Wi-Fi connectivity was strong in a certain area and that resulted in a high noise level since many students gathered in that block to take advantage of the strong connection. Another option was to get all students in one computer class and let them connect on individual laptops but, in checking with the college management, all computer labs had lessons going on all day because lecturers

needed to assist students to catch up with lost time and the time difference for NCV and NATED made it impossible to get them together all at once.

- Load shedding schedules for different locations – if the students were to connect from the comfort of their homes, I had to check the load shedding schedule for all locations where students resided and ensure that no student would be experiencing load shedding during the focus group meeting. Furthermore, if it was possible for all students to connect while they were at the college, it meant that I had to check the load shedding schedule for the area where the college was situated.

- Quality of camera output for students' devices – in considering the fact that I needed to see all participants to successfully facilitate the discussion and also take note of their nonverbal gestures, it became clear that I had to use two laptops because the more people on the Microsoft Team screen the smaller the video output which would have made it harder to see all gestures, especially if the quality of the camera of the device used by a participant was not good.

- Storage space on device to load MS Teams – I needed students who had enough storage space on their devices to download the MS Teams software.

After considering all these factors, I was able to have eight participants (4 from NCV and four from NATED). All participants who finally participated in the study from the pool of many participants who were willing to take part, were those who preferred to connect from the comfort of their home. According to their timetable, the day they agreed on was a day when none of them had to go to college. They were all able to download MS Teams on their devices and there was no load shedding scheduled for their locations on that day. I was able to create a meeting on two laptops at the same time and the audio output was through the speakers of the laptops. On each laptop, four students were connected as guests with me, the researcher as the fifth person (the host). I set up both laptops in a position where I was able to see all eight participants on two laptops although each participant could only see those who were connected to the same laptop but they could hear the participants from the other laptop through the audio.

I allocated codes to all participants to use during the focus group meeting. When referring to a participant, I used the code; for example, P8 meant I was talking to a participant whose code was P8. I read a question and allowed all students to say their views on the question. I used an external voice recorder to record the session since the free version of MS Teams did not have a recording feature. Each group usually consists of 8 to 12 persons but smaller groups of 5 to 7 are recommended for complex topics (McMillan & Schumacher, 2014). The number of participants in this focus group for this study was eight. There were a few glitches caused by connectivity challenges since the capacity of bandwidth in different areas was not strong and background noises sometimes interfered with the signal from other participants. The focus group, like the in-depth interviews, commenced with a short questionnaire to allow students an opportunity to list ICT tools they were familiar with, followed by the discussion questions as per focus group protocol (Appendix H).

3.6.3 Field Notes

Field notes served as a supporting data source for this research. According to McMillan and Schumacher (2014), verbatim accounts of interview sessions and focus groups are digitally recorded to ensure completeness of verbal interactions and are good for reliability checks; however, these recordings do not eliminate the need for taking notes that researchers use to record nonverbal communication that facilitates data analysis. I created space for notes on the interview and focus group protocols and used the space to take notes of some answers as well as nonverbal expressions. For every session, I had a separate protocol with the pseudonyms/codes allocated to each participant, date and time of the scheduled interview or focus group, estimated duration of the session, questions and space for notes. In addition, I had a note book to write extra information that could not fit in the space provided for taking notes on the protocol. Advantages of field notes include that they are fast, cheap and can be used to record initial thoughts and reflect on the interview session (Tessier, 2012). After each interview, the notes were typed, analysed and compared to transcripts of the interview. I recorded the date, time and theme associated with the notes, topic addressed like events that participants shared, points of clarification and any connections that I detected among the participants' statements/perceptions. Other facts like participants' nonverbal expressions I observed during the interviews and focus group discussion and direct

quotes were included on the field notes. I used field notes to highlight all key expressions for quick identification during data analysis. Notes were also used as supporting sources for categories or themes.

3.6.4 Document Analysis

The advantages of documents as sources of data, listed by Creswell and Creswell (2018) that benefitted this study, were: I accessed them at the time that was convenient; they served as a written evidence with facts; and most documents were sent via email by the college. Qualitative researchers seek convergence and corroboration by using different data sources and methods and document analysis is used in combination with other methods as a means of triangulation (Bowen, 2009). Qualitative researchers collect, examine and interpret data from a variety of documents including, but not limited to, official reports, minutes of meetings, newspapers, journals, and advertisement for organisations or for public consumption with the aim of identifying trends, corroborating initial findings and raising additional questions (Creswell & Creswell, 2018; McMillan & Schumacher, 2014). This systematic investigation of text presents non-interactive data which exists independently of the research and is analysed to understand the meaning of the text and the context in which it was created (Leavy, 2017; Roller & Lavrakas, 2015). Moreover, when there is convergence of information from different sources, readers of the research report usually have greater confidence in the trustworthiness of the findings (Bowen, 2009; Denzin, 1970). I requested permission to access institutions' annual and statistical reports for pass rates in order to source more data, pick up trends and patterns and corroborate initial findings.

Table 3.2.: *Documents used for document analysis*

Type of Document	**Brief Description of the document**
Annual Reports for year 2015, 2016, 2017, 2018 and 2019	Annual reports reported on the list of interventions that the college put in place, dates of when they were implemented, changes that took place at the college and the impact of the

	interventions.
Statistics of results for year 2015, 2016, 2017, 2018 and 2019	Statistics reported on students' performance for each level and each subject, indicated the number of students enrolled, number of those who wrote examination, number passed, number failed and number of distinctions.

The trends in pass rates indicated the level of performance of students in subjects where ICT is integrated to corroborate the statements of the participants. For example, if the participants indicated that ICT was integrated in Life Orientation, I checked the general academic performance of students in Life Orientation as a subject. According to Bowen (2009), documents can be used for a variety of purposes including providing means of tracking changes and developments (trends) over a period of time by analysing final reports of the organisation (where available) to get a clear picture of how an organisation or a programme had fared over time and compare them to identify the changes. Bowen (2009) stated that researchers also use data collected through different methods to reduce potential biases that can exist in a research study which is applicable to qualitative case study. In analysing documents, I organised information into categories related to the central question and TA by recognising patterns within the data, coding to uncover themes, finding the meaning of data from the documents, not just by 'lifting' words and passages but by ascertaining that the content of the documents provided answers to the questions of the research study and contributed meaning to the topic being studied (Bowen, 2009). The process of document analysis involved skimming, reading and interpretation of the data in documents (Bowen, 2009).

3.7 DATA ANALYSIS

TA was used because it allowed me, as the researcher, to judge and use different methods to determine themes (Braun & Clarke, 2006; Nowell et al., 2017). TA is a method appropriate for data interpretation using both deductive and inductive

approaches. It is used in studies that aim to understand the influence of any variable used by participants and it provides an opportunity to code and categorise data into themes (Alhojailan, 2012). In this study, data analysis involved multiple levels described by Creswell and Creswell (2018) as organising and preparing data for analysis, reading all data, commencing coding of all data, generating description and themes and representing descriptions and themes. To code, the coding procedure, as detailed in Chapter 4, followed Tesch's eight-step coding process (Tesch, 1990) of reading all transcriptions carefully; finding underlying meaning of one document at the time; making a list of all topics and clustering together similar topics; abbreviating topics as codes and writing codes next to appropriate segments; finding most descriptive wording for topics, turning them into categories and reducing the list of categories by grouping topics and showing interrelationships; making a final decision on the abbreviations for each category and assigning alphabetical codes to data units; assembling data belonging to each category and performing preliminary analysis; and when necessary, recoding of existing data. Making sense of the data required thorough and careful analysis throughout the process (McMillan & Schumacher, 2014).

3.8 MEASURES TO ENHANCE TRUSTWORTHINESS

In this study, I adopted different trustworthiness criteria accepted by many qualitative researchers to ensure the rigour of the findings because of the distinctive features of the approaches selected. In qualitative studies, researchers use Guba and Lincoln's technique to enhance trustworthiness, namely, credibility, dependability, confirmability and transferability, in contrast to quantitative studies where researchers consider validity, objectivity and reliability (Anney, 2014; Denzin & Lincoln, 2018; Guba & Lincoln, 2001). The following criteria were used:

3.8.1 Credibility

To establish credibility, I employed data triangulation by using different sources of data and research instruments, such as interviews, a focus group discussion, document analysis and field notes. Credibility is defined as confidence in the truth of the research findings to reduce bias and cross examine the integrity of participants' responses; which include adopting a peer debriefing strategy; and using member checking to determine the accuracy by taking the draft report on the major findings

and themes to participants for them to check for accuracy which included follow-up interviews (Anney, 2014; Creswell & Creswell, 2018; Flick, 2014). The participants checked for the accuracy of the data that was collected and follow-up interviews were conducted where it was necessary.

3.8.2 Dependability

To establish dependability, which is defined as the stability of findings over time, I used a code-recode strategy by firstly coding the data using MS Excel and then coding it again using Atlas.ti and comparing the results. I adopted an audit trail strategy to examine the records of the study, to determine the methodological decisions made and to understand the reasons for these decisions. In addition, peer examination was used during which I discussed my research process and findings with neutral colleagues who were experienced in qualitative research (Anney, 2014; Creswell & Creswell, 2018).

3.8.3 Confirmability

To establish confirmability which is defined as the degree to which the results could be confirmed by other researchers, the researcher is expected to demonstrate how conclusions and interpretations of data were reached. Therefore, including the reasons for theoretical, methodological and analytical choices throughout the study is imperative so that others can understand how and why decisions were made (Nowell et al., 2017). In this study, I used reflexivity, which is one of the core characteristics of qualitative research, by keeping a journal on how interpretation of findings were shaped by background and clarified biases that I brought into the study. All the details are included on this report (Anney, 2014; Creswell & Creswell, 2018). Confirmability is established when credibility, transferability, and dependability are all achieved and by providing a thick description of all the processes in the report that led to the conclusions (Nowell et al., 2017).

3.8.4 Transferability

Transferability is defined as the degree to which the results can be transferred to other contexts and be taken as authentic (Merriam, 2009; Guba & Lincoln, 2001). I used a rich, thick description strategy, which is why this study detailed all the research processes from data gathering, the context of the study and production of

the final report to convey findings which will enable other researchers to judge how well the research context fits other contexts, helping them to replicate the study with similar conditions in other settings. In addition, I used purposive sampling with key informants who are information-rich and knowledgeable for authenticity of the research results (Anney, 2014; Creswell & Creswell, 2018). According to Tracy (2013), resonance is accomplished through transferability when readers of the research report believe that the findings of the research study correspond to something significant in their world.

3.9 LIMITATIONS

The limitations of a research study are its flaws and shortcomings which are associated with the research design that impose restriction on the study and are out of the researcher's control (Theofanidis & Fountouki, 2018). Like all other studies, this research study had limitations.

3.9.1 Sample Size

The sample size of 16 students was small when compared to a number of students in SA's TVET colleges who attend in inclusive-ICT-integrating classrooms.

3.9.2 Diversity of Population

The TVET college selected for this study is a multicultural site with a diverse population that uses a variety of languages; however, all questions used during the interview sessions were asked in English. The participants responded well in English, with the exception of one student who mixed IsiZulu and English in his responses. English was a limitation because I felt that some students could have expressed themselves better in their mother tongues.

3.10 ETHICAL CONSIDERATIONS

Ethical clearance from the College of Education at University of SA was received (Appendix A). According to UNISA Policy on Research Ethics (2016), no research activities should be undertaken without ethical clearance from the appropriate Ethics Review Committee. Therefore, research activities for this study such as requests for permission to conduct research from DHET and college management; addressing participants and requesting them to take part in the study; and data generation only

commenced after the approval was granted in full by the College of Education Ethics Committee. According to the guidelines published in the gazette on Policy Standards on Approval to Conduct Research in Public Colleges, students should complete the prescribed application form titled: DHET 004: Appendix 1 – Application Form for students to Conduct Research in Public Colleges (DHET, 2016). Moreover, the same guidelines list all the other documents that must be attached to the application including the ethical clearance of the proposal and any other relevant documents. They further state that studies that involve fewer than 10 colleges must request permission directly from the specific colleges not from DHET (DHET, 2016). I requested permission from the College Principal of the institution where the study was conducted (Appendix C); however, an initial request to DHET had been sent as required by UNISA and the e-mail communication (Appendix B) was noted on my journal.

I adhered to ethics and guidelines prescribed for conducting research and data generation in all different phases as explained by McMillan and Schumacher (2014) as follows:

Phase 1: Planning. In this phase, I gained permission to use the research site and met the participants. Prior to conducting any research study, researchers must adhere to ethical issues that include applying to the institution's ethics committee, obtaining necessary permissions, selecting a site without vested interest and negotiating authorship for publication (Creswell & Creswell, 2018). Prior to conducting this study, I applied for permission from the Ethics Committee at UNISA to conduct the study. As part of the application I submitted the prescribed UNISA application form and all necessary supporting documents. At this phase, the questions had been prepared and I organised resources like voice recorders and note books to record participants' responses and gestures including downloading MS Teams for data generation via SCMC.

Phase 2: Beginning Data Generation. Once the ethics approval had been granted, I established rapport with DHET and the college management by sending a request for permission to conduct research which was granted. I visited the college to recruit the participants; requested them to participate; discussed all the ethical requirements with them; got their consent; and discussed the tools to conduct the interviews,

including getting timetables for different courses to schedule the appropriate times as well as getting documents like policies and statistics on student performance in different subjects. McMillan and Schumacher (2014) explained that in this phase, the researcher obtains data primarily to become oriented and gain a sense of the participants and then adjusts the techniques to be used.

Phase 3: Basic Data Generation. Once the participants had voluntarily signed consent forms and a convenient time for the interviews had been scheduled, participants downloaded MS Teams and I tested the connection to ensure that it was working. Five interviews commenced as scheduled and agreed upon with participants but three interviews had to be rescheduled. I respected participants, gained their trust, avoided leading questions or disclosing sensitive information or collecting harmful information, avoided exploitation and deceiving participants and asked questions stated in the interview protocol although probing questions were catered for (Creswell & Creswell, 2018).

My values and ethics were an integral part of this study because they shaped what I understood and my interpretation of what was presented by participants (Addam, 2014). I ensured that data was protected, stored in a safe place and all electronic data encrypted with a password. As stipulated by McMillan and Schumacher (2014) the following research ethics guidelines were adhered to:

3.10.1 Dignity of Stakeholders

The participants' privacy was respected and they were made aware of the power they had in the study. During the recruitment meeting and in writing they were informed of the purpose of the study, why they were invited to participate, the nature of their participation, how the data would be collected using SCMC, the reasons for selecting the method and the projected duration of the interview sessions and focus group.

3.10.2 Confidentiality and Anonymity

I informed participants that their identities would be protected and codes/pseudonyms would be used in the report to protect them.

3.10.3 Voluntary Participation

All participants were informed that their participation in this study was voluntary. They were under no obligation to consent to participate and were free to withdraw at any time and without giving a reason. Those who decided to take part were given the information sheet to keep and were asked to sign a written consent form.

3.10.4 Non-Maleficence and Beneficence

All Covid-19 regulations, including wearing masks, sanitising and social distancing were adhered to in order to protect both participants and myself as stipulated by UNISA and the government of SA. Participants were also informed that no harm was anticipated to be caused by their participation in this study. There were no foreseeable negative consequences of harm; however, the time of the interviews could have been inconvenient to them. They were, therefore, requested to indicate a time convenient to them, when they would be able to access MS Teams. They were also informed up front that participating in this study would not personally benefit them; however, the findings would assist TVET institutions when integrating ICT in their inclusive classrooms and would also assist in proposing guidelines.

3.11 CHAPTER SUMMARY

This chapter elaborated on the interpretivism as research paradigm, qualitative approach and case study design that guided collection of data for this study. It also explained how in-depth interview, focus group and document analysis were used as techniques to collect data. It explained how purposive sampling was used to select the 16 participants who took part in the research and provided the profiles of the students who participated. It also elaborated on the measures to ensure trustworthiness. It provided brief description of how data was analysed as detailed in Chapter 4. It concluded by explaining the limitations for this study and ethical considerations meant to protect the interests of the participants. The next chapter presents the results of the empirical research.

CHAPTER 4:

DATA ANALYSIS AND PRESENTATION OF FINDINGS

4.1 INTRODUCTION

This chapter presents the findings, based on the responses of students, obtained using in-depth individual interviews, focus groups, document analysis and field notes as described in detail in Chapter 3. It also sets out the step-by-step process employed to analyse data using Thematic Analysis (TA) to examine the perspectives of participants in detail highlighting similarities and differences and summarising key features of large data to produce clear report (Nowell et al., 2017). It also provides a comprehensive explanation of how Atlas.ti and other CAQDAS were used to analyse data. According to Miles et al. (2014), researchers may use multiple software programs to analyse data because there is no single program that can do everything well but different software presents a variety of strengths in data analysis.

4.2 DATA PREPARATION

For readers to evaluate the trustworthiness of the research process, they need to be clear about how the researcher analysed the data or what assumptions informed the analysis (Nowell et al., 2017). TA was an appropriate method for data interpretation using an inductive approach because it provided an opportunity to code and categorise data to themes (Alhojailan, 2012). Unexpected themes developed during the coding process and patterns were picked up from raw data (Roberts et al., 2019). I used Tesch's eight-step coding process, mentioned in Chapter 3 (Section 3.7) with an open coding process on MS Excel and an *In Vivo* coding process using Atlas.ti as a CAQDAS program. *In Vivo* is used to create codes using participants' actual spoken words that represent the participants' meaning of data (Archer et al., 2017; Manning, 2017; Miles et al., 2014; Saldana, 2009) and open coding is used to create codes from text in a transcript (Archer et al., 2017).

4.3 DETAILED STEP-BY-STEP PROCESS OF DATA ANALYSIS

Data analysis took place simultaneously with data generation, which meant that while interviews were taking place, I transcribed the data I collected earlier (Creswell & Creswell, 2018). I "mixed and matched" the analysis by using MS Word and Excel

for first-cycle coding or preliminary coding and Atlas.ti for second-cycle coding which required analytical skills to classify, prioritise, integrate, synthesise, abstract, conceptualise and build themes (Saldana, 2013). CAQDAS programs were used following the thematic analysis steps of Tesch (1990) as stated in Chapter 3 (Section 3.7).

4.3.1 Step 1: Organising and Preparing the Data for Analysis

After data had been collected, it was organised and transcribed. In this step, I typed field notes, transcribed the interview and focus group data, sorted and arranged the data into different types (Creswell & Creswell, 2018) and used the field notes to elaborate on impressions, the environment, the context, behaviours and nonverbal cues that may not be captured in an audio recording (Sutton & Austin, 2015). Data was transcribed in MS Word because I viewed it as an easy program to use. It was then copied and pasted into MS Excel for first-cycle coding and analysis. The advantage of using MS Excel was that it has columns and rows which easily separated data into segments and allowed all transcripts to be loaded on one file but in different sheets from where I could move from one transcript to another easily. Data transcribed in either MS Word or Excel could be easily imported to Atlas.ti for analysis (Archer et al., 2017).

Since all interview questions were grouped under relevant research sub-questions, this became an advantage when it came to data analysis and coding. To organise data, researchers use sources such as research questions or sub-questions, research instruments like interview protocols, themes, concepts and categories used by other researchers, prior knowledge of the researcher or personal experience or just the collected data (McMillan & Schumacher, 2014). To fully understand data, researchers must be engaged with it from the beginning (Flick, 2014).

I transcribed verbatim all recordings done with an audio device regardless of how comprehensible the transcript might have been when it was read back. Transcribing interview and focus group data followed a process described by Sutton and Austin (2015) where spoken words, recorded with a device, were converted to typed words; every text line was numbered; errors were corrected while listening to the recording; participants' information was anonymised; notations were inserted for pauses or laughter; signs of discomfort were noted; punctuation inserted; and all other

contextual information that might have affected the participants was added. When the transcripts were uploaded on Atlas.ti, the numbering of each line happened automatically. I used code names, as indicated in Chapter 3 under participants' codes and a brief profile section to continuously protect the identities of the participants.

4.3.2 Step 2: Read or Look at all the Data

Preliminary analysis of one document at a time took place guided by Steps 1 and 2 of Tesch's eight-step process (Tesch, 1990). This involved reading data repeatedly to make sense of the transcribed data, reflecting on its overall meaning and making notes of codes emerging from the data (Creswell & Creswell, 2018). I used this step to answer questions on the general ideas of participants, the tone of each idea and the overall depth, credibility and use of the information (Creswell & Creswell, 2018). I also did co-reading which is described as reading data with theory in mind as "part of mental furniture" to internalise and organise text with the theoretical framework in mind (Denzin & Lincoln, 2018; Spivak, 2014).

4.3.3 Step 3: Start Coding the Data

Coding is a process of organising data by assigning categories, concepts or labels to segments of information collected during data generation (Creswell & Creswell, 2018) to bring out the meaning of what the participants were saying. Miles et al. (2014) described codes as the labels that assign symbolic meaning to the descriptive information compiled during the research process. During coding, I identified and interpreted topics, issues, similarities and differences (Sutton & Austin, 2015). To do preliminary coding, I used different colours on MS Excel on the transcribed data and similarities were indicated with a similar colour. Researcher must code in such a way that another researcher who is coding the same transcript would arrive at the same results on the similarities and differences which supports the credibility of the analysis (Sutton and Austin, 2015). After obtaining Atlas.ti from UNISA, I created a project on the software and uploaded the transcripts, one document at a time. On Atlas.ti, open coding and *In Vivo* coding were used for each transcript under different questions. Sub-themes were then developed followed by themes. I continued to follow Tesch's Steps 3-8 (Tesch, 1990) by making a list of all topics and clustering similar topics together and creating themes. Following the Atlas.ti manual to select

the text that I wanted to code, I then chose *Code In Vivo* on the menu for the text to be coded instead of abbreviating topics as codes and writing codes next to appropriate segments. I created group codes using the most descriptive wording for topics, turning them into categories (sub-themes) and reducing the list of categories by grouping topics and showing interrelationships and then creating themes using the group manager. I then finalised each category giving it a theme name, assembled data belonging to each theme and performed analysis, and in some cases, recoded existing data. Groups of codes emerged from data from which sub-themes and themes were created to answer the research questions and achieve the objectives based on the theoretical framework and literature review. A coding table was produced and exported to MS Excel for comparison with preliminary coding results that I initially did on MS Excel.

4.3.4 Step 4: Generate a Description and Themes

Descriptions were generated using analytical skills and used to categorise and create themes that were useful for this case study (Creswell & Creswell, 2018; McMillan & Schumacher, 2014). This enabled an analysis of participants' views and concerns without being influenced by my interests, concerns and preconceptions (Taylor et al., 2016) and assisted in combining codes from different transcripts when presenting the findings in a coherent and meaningful way (Sutton & Austin, 2015). A cyclical process of pattern-seeking, examining data following my assumptions, checking for recurrent data, going back and forth to scrutinise each pattern, and then modifying the idea as the analysis proceeded was used in this study. It included searching for plausible explanations for links among categories (McMillan & Schumacher, 2014).

4.3.5 Step 5: Representing the Description and Themes

In the next section, the tables presenting the code-document from Atlas.ti and the descriptions of themes and sub-themes that emerged from the study are presented and discussed in detail. Presentation of findings and interpretation of data in each theme and sub-theme in this study was supported by literature and direct quotations from the participants. According to Grant and Osanloo (2014) there is a complementary relationship between the theoretical framework and the research questions. It is for this reason that themes and sub-themes are divided using the

theoretical framework to be able to easily understand the data collected and answer the research question.

Table 4.1.: *Sub-themes emerging from analysis using Atlas.ti*

Title:	ATLAS.ti - Code Document Report
Project:	TVET Students' Experiences with ICT integration in their inclusive classrooms
User:	Gugu Ndlovu
Date:	2021/03/16 - 13:48:04
Values:	Absolute frequency
Count:	Quotations
Abbreviations	
Gr	Groundedness of codes (number of quotations coded by a code) or documents (quotations created in a document)
GS	Number of documents in a document group or number of codes in a code group

	Transcript for Focus Group Gr=286	N6S1 - IIIP Gr=96	N6S2 - IIIP Gr=65	N6S3 - IIIP Gr=79	N6S4 - IIIP Gr=181	NCVL4S1 - IIIP Gr=88	NCVL4S2 - IIIP Gr=59	NCVL4S3 - IIIP Gr=89	NCVL4S4 - IIIP Gr=101	Totals
Advantages of ICT integration (Gr=59; GS=57)	7	5	10	9	12	4	3	6	3	59
Affects (feelings) of students towards ICT integration (Gr=32; GS=29)	7	7	2	3	2	1	1	5	4	32
Changes that students wish to see regarding ICT integration (Gr=88; GS=85)	32	11	2	6	9	13	5	7	3	88

Cognitive beliefs of students towards ICT integration (Gr=92; GS=85)	28	20	7	3	13	4	7	2	8	92
Current Limitations that students are experiencing with ICT integration (Gr=49; GS=49)	2	5	9	6	2	2	3	14	6	49
Disadvantages of ICT integration (Gr=47; GS=45)	9	5	6	7	3	5	0	4	8	47
Forethought Capabilities of students towards ICT integration (Gr=29; GS=28)	2	7	1	3	7	1	0	3	5	29
ICT tools that students wish to use that they are currently not using (Gr=31; GS=14)	5	2	3	4	5	5	3	2	2	31
Perceptions of students regarding current ICT interventions	20	2	4	1	6	3	0	2	2	40

(Gr=40; GS=32)										
Perceptions of students about benefits of ICT integration (Gr=97; GS=93)	17	12	7	11	13	11	6	12	8	97
Perceptions of students about challenges of ICT integration (Gr=57; GS=54)	6	9	4	2	8	7	3	6	12	57
Perceptions of students about fear of using ICT and digital gap between students and lecturers (Gr=66; GS=66)	13	2	9	4	12	16	3	4	3	66
Perceptions of students regarding ICT role on their academic performance (Gr=135; GS=125)	39	9	7	14	23	4	14	7	18	135
Purpose of ICT usage by students (Gr=116; GS=99)	34	3	3	2	31	13	9	11	10	116
Results credited to ICT integration	4	0	3	0	2	3	2	1	2	17

(Gr=17; GS=16)										
Self-reflection Capabilities of students towards ICT integration Gr=21; GS=21	9	2	0	0	7	0	2	1	0	21
Self-regulatory Capabilities of students towards ICT integration Gr=23; GS=23	3	2	0	0	15	0	2	1	0	23
Students' perceptions of lecturers' role in an inclusive-ICT-integrating classroom (Gr=111; GS=108)	56	7	4	8	11	8	6	6	5	111
Symbolising Capabilities of students towards ICT integration (Gr=25; GS=24)	4	0	0	2	8	2	0	4	5	25
Types of ICT tools that students use and are exposed to (Gr=102; GS=54)	20	7	6	14	19	4	8	11	13	102

Vicarious Capabilities of students towards ICT integration (Gr=20; GS=20)	5	6	1	0	5	0	1	1	1	20
Totals	322	123	88	99	213	106	78	110	118	1257

Table 4.2.: *Descriptions, themes and sub-themes that emerged from the data*

DESCRIPTION	THEMES	SUB-THEMES
Theme 1 and 2 focused on understanding the personal factors of the students; the influence of these factors on the behaviour and social setting as presented in the triadic reciprocal system, and also answer the first research sub-question.	1. Students' agentic perspective towards ICT integration	a) Cognitive Beliefs of students towards ICT integration • Perceive ICT either: relevant, difficult, or easy
		b) Affects (feelings) of students towards ICT integration • Positive feelings (Enjoyed and liked using ICT; Prefer ICT than textbook; Felt accommodated; Wished to use it in all subjects) • Negative feelings (Scared to use ICT; Felt excluded when ICT was not used; Could not fully participate/engage when ICT was not integrated)
	2. Students' Fundamental Capabilities towards ICT integration	a) Symbolising capability of students towards ICT integration • Prepared students for jobs • Provided skills to cope in the workplace
		b) Vicarious capabilities of students towards ICT integration • Saw other students struggle • Asked assistance from lecturers and peers • Saw those who lacked ICT skills struggle to get jobs
		c) Forethought capabilities of students towards ICT integration • Assumed they would cope well in workplace with acquired skills
		d) Self-regulatory capabilities of students towards ICT integration • Recording lectures • Independence and confidence in using ICT tools • Take pictures of notes on the board
		e) Self-reflective capabilities of students towards ICT integration • Learned from peers • Shared knowledge • Improved participation
Theme 3 and Theme 4 focused on	3. Behavioural perceptions	a) Types of ICT Students use and exposed to • Devices

understanding the behaviour of the students and its influence on the personal factors and social setting; as well as answering the second research sub-question.		➢ Laptops ➢ Voice recorders ➢ Cellphones/smartphones ➢ Reader pen/C-pen ➢ Advanced electronic Braille machine ➢ Smartboard ➢ Digital Video Projector (DVP) ➢ Special Scanners • Applications ➢ Microsoft Office (Word, Excel, PowerPoint, Access) ➢ JAWS ➢ PDF ➢ Google ➢ WhatsApp ➢ Facebook
		b) Purpose of ICT usage by students • Communication • Social media • Assignments • Research • Sharing documents e.g. previous question papers
	4. Students' Academic Performance	a) Perceptions of student regarding Current ICT Intervention • Library • Well-equipped resource centre • Wi-Fi connection • Assistive devices • DU • NSFAS bursary scheme
		b) Perceptions of students regarding ICT role on their academic Performance

		• Improved academic performance • Revision • Sharing previous question papers • Discussion groups • Study independently • Get exposed to variety of ICT tools • Easy access to information and simple to understand
		c) Results credited to ICT integration • Some subjects where ICT is integrated e.g.: ➢ Life Orientation ➢ Introductory Information Processing ➢ Computer Practice
Themes 5, 6, and 7 focused on understanding the social and environmental setting and its influence on the personal factors and behaviour of the students; as well as answering the third research sub-question.	5. Challenges of ICT integration	a) Perceptions of students about challenges of ICT integration • Forgetting instructions • Resistance to change by student and lecturers • Poor network connection • Load shedding • Not enough time in a period • Lack of personal data • Viruses • Noise levels
		b) Disadvantages of ICT integration • Loosing unsaved work • Electricity interruptions (load shedding) • Poor network connection • Poor Wi-Fi range • Other students on social medias during a lesson • Limited time in a period

	6. Benefits of ICT integration	a) Perceptions of students about benefits of ICT integration • Made doing assignments easy • Useful for research • Encouraged participation • Assisted in finding jobs • Gave students living with disabilities a chance to be on par with peers
		b) Advantages of ICT integration • Opportunity for students living with disabilities to participate • Quick access to information • Easy and fast communication • Easy to do assignment • Easy to do research
	7. Perceptions of students about lecturers' capabilities to model ICT usage and facilitate effective integration	a) Students' perceptions of the lecturers' role in an inclusive-ICT-integrating classroom • Not enough support but there is support e.g. encouragement, reminded of forgotten instructions • Majority of lecturers do not understand different disabilities • Students preferred to be assisted by peers • Supported by DU • Supported by IT personnel
		b) Perceptions of students about fear of using ICT and the digital gap between students and lecturers • Fear ➢ Nervous at first ➢ Assume older lecturers are scared to use ICT ➢ Solution: exposure to ICT • Digital gap ➢ Believe there is a gap between lecturers and students ➢ Lecturers rather read from textbook in class instead of using ICT ➢ Associate gap with age – "the older the lecturer, the bigger the gap"

		➢ Solution: exposure to ICT and training
Theme 8 focused on the current limitations; the changes that students wish to see and the ICT tools they wish to use that they are not currently using or limited in using; and also answering the fourth research sub-question.	8. Students' views on guidelines for effective ICT integration	a) Changes students wish to see regarding ICT integration • Compulsory integration of ICT by all lecturers • Fun and enjoyable lessons • Increased number of resources in all classrooms • All students must have laptops • Train lecturers to integrate ICT and also understand different disabilities • Increase Wi-Fi range
		b) Current limitations that students are experiencing with ICT integration • Wi-Fi only available in hot spots • Limitation on time to access internet • Inconsistency in enforcing rules such as use of cellphone in class • Lack of uniformity in ICT integration
		c) ICT tools that students wish to use that they are not currently using • Smartboard; Tablets; Smart Television; Virtual Reality; DVPs; Dragon software for students with dyslexia; Braille devices for blind students

4.4 DISCUSSION OF IDENTIFIED THEMES AND SUB-THEMES

The themes and sub-themes discussed in this section emerged from the codes in the data and are extended phrases or sentences that signal the bigger meaning behind codes or group of codes. They are outcomes of coding, categorising and analytical reflections that identify what a unit of data is about or what it means which also describe and interpret aspects of the phenomenon being researched (Leavy, 2017; Saldana, 2015).

4.4.1 Theme 1: Students' Agentic Perspectives Towards ICT Integration

As established in Chapter 2, agentic actions in exploring, manipulating and influencing the environment matters more than just the exposure to stimuli. An individuals' beliefs and affects are mechanisms of their agentic perspective (Bandura, 2008). This theme focused on cognitive beliefs which are one's knowledge about something and affects which are about how one feels about something (Vossen et al., 2018). The cognitive beliefs were students' knowledge about ICT and affects were about their positive and negative feelings towards ICT integration.

4.4.1.1 Sub-theme 1: Cognitive beliefs of students towards ICT integration

Students' knowledge about ICT and whether they perceived integration as relevant and easy for them was examined. According to Luhamya et al. (2017), teachers who perceived ICT as important were motivated to use it in their classroom for teaching and learning. Similarly, an assumption could be formed that students' knowledge about ICT and their perception of it as relevant, difficult or easy would impact on how they used it. The findings showed that that students perceive ICT integration as relevant and easy.

> *N6S3-IIIP: I think it is a good thing since we are learning in the world of Fourth Industrial Revolution.*

Some believed that it makes things easier, simpler and more easily understandable compared to using a textbook and it makes information easily accessible.

> *N6S1-IIIP: So technology for me does it well, and it makes me understand what the lecturer is teaching and it also makes it easy for me to be able to work with whatever that is being presented to me via technology.*

N6S2-IIIP: I feel technology brings a lot of things to us, especially information, ……when you have a smartphone with you, it's easy for you to access info at that time.

Students living with disabilities believed that integrating technology is an opportunity for them to pay attention in class more fully and focus on the lesson without worrying about things like taking notes and finishing assignments on time. They were able to work independently.

N6S4-IIIP: I think it's a great opportunity for students like, like me, ah, to use more of technology in class …… smartboard, eh, for instance or, eh, it would then make life a bit easier because if the teacher is writing or taking down notes and that's where I become even slower.

NCVL4S2-IIIP: I-simple for thina [it's simple for us], eh. Ah, for ama – assignments [the assignments] and with ama-readers [the readers] because sometimes ama-lecturer awa-understand [the lecturers don't understand] and they are impatient. Technology ingaba-good [would be good] for disabled people.

4.4.1.2 Sub-theme 2: Affects (feelings) of students towards ICT integration

This sub-theme focused on students' feelings towards ICT integration. If students have positive attitudes towards ICT, integration would be positively influenced (Buabeng-Andoh & Issifu, 2015). In expressing their feelings towards technology, students compared it to textbooks and admitted that at first they were scared to use technology such as computers but eventually started understanding it.

N6S1-IIIP: I love working with technology, I enjoy it more than the actual books.

NCVL4S3-IIIP: At first, I was scared because I didn't know how to use for example, a computer. But, as time goes by, uhm, I was, I was able to, to follow the instructions..

N6S2-IIP: It is more ah, adventurous cos you access another world.

Students also expressed that all lecturers, for all subjects should use ICT, including those who are teaching theory subjects. According to students who are not living with disabilities, ICT is mostly used by lecturers who are teaching computer-related

subjects such as Life Orientation, Computer Practice, Information Processing and Computer Financial Systems.

NCVL4S5–FGP: …I don't think we use much technology at school because we only use it when we go to do, ah, computer-related lessons. But most of the time our lecturers uses boards to explain things and sometimes it's hard….

N6S8-FGP: We only use laptops when we are in our practical classes which are IP and Computer Practice.

However, the students living with disabilities feel that excluding ICT from teaching and learning will mean that they are not accommodated because they cannot fully engage in class if ICT is not integrated.

NCVL4S8-FGP: …on my side, I use technology almost every day in class, because there is no way I can be able to participate, or to study in class without using technology.

NCVL4S4 – IIIP: Eh, because if you, you do not use ICT which means, I'm not, I'm not included in your class.

When asked if all lecturers should use technology in their classrooms, all students agreed that ICT must be integrated in all subjects.

N6S1-IIIP: I think it should be used by all lecturers, not only provided to the lecturers that teach computers in a world that is using technology.

Researcher: Give me an example of one theory subject that you have where ICT can be useful.

N6S3-IIIP: I think Office Practice would be better if they somewhere, somehow use it, they use the ICT to at least help us understand some modules …… to be familiar with what is going on right now in the office environment.

N6S2:-IIIP: Cos, sometimes in Accounting, we make mistakes which we are not aware of. So, I think it will limit mistakes.

4.4.1.3 Summary

Based on the premise that attitude is an individual's psychological inclination that entails cognitive beliefs and affects to evaluate an object in a positive or negative manner and determine behaviour (Aladwani, 2014). TVET students' psychological tendencies and feelings towards ICT and integration, expressed in this study, were positive as they believed that ICT makes it easier for them to access and understand information. Students perceived ICT to be more interesting, easier and fun and their openness to use it was influenced by their attitudes towards it which supports assertions made by other researchers (Buabeng-Andoh & Issifu, 2015; Hajara & Bukari, 2017). Even though exposed to a variety of technologies, students felt that ICT was not used enough because it was not integrated by all lecturers in all subjects. This supports Makura (2014) in stating that ICT had been minimally used.

4.4.1.4 Interpretation of Students' Agentic Perspectives towards ICT integration

Based on students' agentic perspectives, ICT integration is relevant for the digital era they are living in. It makes subject matter easy to understand when used in the classroom as a teaching tool; they prefer ICT compared to textbooks and wish if all lecturers can integrate it in their classrooms; and students living with disabilities feel that classroom setting that are not integrating ICT are discriminating against them because they feel not accommodate. To students, ICT represented fewer textbooks; there is no need for taking notes by hand in class, especially for students living with disabilities; and job prospects in a 4IR era are enhanced. This correlates with findings in a study conducted by Dube and Scott (2017) among university students where they were not happy with the fact that traditional ways of teaching and learning were still used. The availability and access to ICT made students feel empowered and confident and did not discriminate but rather accommodated all of them. As indicated by Noruwana, Chigona and Malanga (2018), ICT positively empowered individuals and served as powerful tool for information, psychological, cultural, social, political and economic transformation and empowerment when contextualised.

4.4.2 Theme 2: Students' Fundamental Capabilities Towards ICT Integration

This theme focused on the cognitive power that students possessed within themselves which impacted how they viewed ICT and influenced their behaviour towards it. Therefore, experiences of students could be understood by exploring their symbolising, vicarious, forethought, self-regulating and self-reflection capabilities which played a role in how they viewed ICT and influenced their behaviour towards integration (Bandura, 1999).

4.4.2.1 Sub-theme: Symbolising capabilities of students towards ICT integration

This sub-theme focused on what ICT integration symbolised for students and their responses indicated that it prepared them for their future, led to better job opportunities and easier ways to cope in future work environment.

> *N6S1-IIIP: So, when we use the ICT in classrooms, I think it prepares us much better and it actually makes us be more suitable to be able to go work in the outside world.*

> *N6S3-IIIP: It helps ma'am, because even if you do get employed in other parts of the country you wouldn't be left behind, at least you will be having information and knowledge of how to probably use the equipment that they will be using also.*

> *NCVL4S3-IIIP: Uhm, it's preparing us for, when we are, eh, in the working environment.*

4.4.2.2 Sub-theme: Vicarious capabilities of students towards ICT integration

This sub-theme focused on the capabilities of students to avoid trial-and-error of direct experiences, but vicariously achieve behavioural, cognitive and affective learning by observing other people's actions and the outcomes of those actions (Bandura, 1999). These actions and consequences included seeing other students struggling and missing deadlines, others asking for assistance from lecturers and peers and other people struggling to get jobs because they lacked knowledge of ICT.

> *NCVL4S2-IIIP: As in now, kuphume ama-* assignments [assignments were distributed] *kune* [there is], *there is a blind student ongatholanga* [who didn't get] *ama-assignments* [assignments] *because siwa-receive* [we received them] *via*

WhatsApp. And then masimbuza [when we asked him/her] *uthi (he/she said) she thinks ukuthi (that) yithombe nje* [it's just pictures], *normal pics, never asked anyone ukuthi amfundele* [to read for him/her].

N6S7-FGP: If one student, can't, eh, eh, really understand, he/she will ask the lecturer or one of the students, yah, and explain, explain if they can't hear from the lecturer

NCVL4S1-IIIP:.. most people if they didn't get the knowledge of the computers they no longer, eh, get the job in the workplace.

N6S4-IIIP: …..get to a point where we can't get employment because we could not be able to use a simple thing like a computer…

4.4.2.3 Sub-theme: Forethought capabilities of students towards ICT integration

The focus was on the capabilities of students to anticipate the outcomes of integrating ICT in the classroom and they seemed to be motivated by believing that if they were proficient in using ICT in the classroom, they would not struggle when they got to the workplace. They assumed that people struggled because of a lack of knowledge and skills in using a variety of ICT tools and applications that were not acquired while they were still studying. According to Bandura (1989), in exercising forethought, people motivate themselves and guide their actions in anticipation of the desired outcome.

N6S4-IIIP: And if you want to move from one industry to another, you can't always have someone to always assist you in using the technology because you've got that, you were not taught.

N6S3-IIIP: Since we are using ICT now ma'am, when we are already employed in other companies it would be easier to use technology without any problems, without asking for any assistance, without asking for any training or anything like that.

NCVL4S3-IIIP:..I'll be able to maybe, if I'm, eh, in a workplace, maybe I'll be able to open a computer, a laptop, to switch it on, to plug, eh, a printer and know how to operate it...

4.2.4.4 Sub-theme: Self-regulatory capabilities of students towards ICT integration

This sub-theme focused on the independent actions of students when using ICT to analyse the given task, set goals and devise plans to do the task, enact tactics and strategies to accomplish tasks on their own by self-regulation which is the process of activating and sustaining thoughts, behaviours and emotions that would make them reach their own goals (Woolfolk, 2014). Bandura (1989) stated that people have the capability to direct their own lives which enables them to exercise control over their feelings, thoughts and actions based on the outcomes they want to achieve. Students were able to realise for themselves the factors that hindered them from achieving the desired results and explained the actions, strategies and changes that took place because of ICT integration.

NCVL4S4-IIIP: In a class ma'am, I used to listen, only listen.

Researcher: Okay. As you listen, do you put your recorder on?

NCVL4S4-IIIP: Yes. I used to record the lecture and then after classes I play all the records of the day.

NCVL4S5-FGP: ….now I'm much more confident to use a laptop even when I am at home, to research things and do other assignments…..

NCVL4S8-FGP: …..so far it gave me more confidence, eh, when using computers, I can able to see a lot of things, I can be able to do the research, to check something in the internet on my own……

N6S4-IIIP: Yah, it has, it has. But in a good way. …….. able to use like your smartphones to take pictures of stuff or to google information that you don't understand, cos sometime you just read a text on a textbook whereas you don't even understand what that word means.

4.2.4.5 Sub-theme: Self-reflective capabilities of students towards ICT integration

This sub-theme focused on the capability of students to self-examine their cognitive, affective, behavioural functions and competencies that gave them self-efficacy which is described by Woolfolk (2014) as a sense of being able to deal effectively with given tasks. Students were able to monitor their actions, analysed their experiences,

knew what worked and what did not work, judged their capabilities and changed what needed to be changed in order for them to reach the goal (Bandura, 1989). This capability allowed students to identify their strengths, weaknesses, thinking patterns and changes that were needed. The students explained that being in an inclusive-ICT-integrating classroom assisted them to learn from other students; share knowledge with peers and increase participation compared to classrooms that did not have technology.

N6S4-IIIP: For an example, for me with dyslexia, I may not be able to read information on the board or take notes but I might be able to help someone connect on their Zoom, I might be able to help someone upload documents but then that other person is able to then help me read or type information

NCVL4S4-IIIP: …if I'm with other students who are not blind like me, I feel, I feel good ma'am because, eh, I feel good because, eh, some of them, they can help me.

NCVL4S2-IIIP: Because, ah, I see myself different than them but, angifuni (I don't want) ukuzi-down-grader [to down-grade myself] ngithi [and say] I'm special like. Mangiseclasini [when I'm in class] ngizibona [I see myself] ngifana [similar] nabo [to others].

N6S6-FGP: For me I would say, I participate more in an ICT, using ICT devices than in theory classroom because it's easier, sometimes it's easier to use and you can find information more.

NCVL4S8-FGP: My participation in a classroom that is using technology, to me is more higher than the one that is, is, eh, does not have a technology to assist me. …… I can express myself in a good way than the classroom that is, doesn't have any technology.

NCVL4S5-FGP: …I believe that in a technology class you get to participate more because now your focus is in a computer lab reason being you hardly use it and you have to be focused, so, you won't do any mistake….

4.2.4.6 Summary

Based on Bandura's SCT (1999), fundamental capabilities assist individuals not to be passive. Students' symbolising capabilities regard ICT integration as a means for them to acquire the skills and knowledge necessary to be employable. Marcino (2018) and Hussain et al. (2017) pointed out that ICT prepared students for the real world with skills and knowledge that their future employers would look for. Students' vicarious capabilities indicated that they had learned from the actions of role models such as lecturers and peers. This view is supported by Ramorola (2018) who stated that students are able to teach themselves or learn from each other how to use technology through collaborative learning. The forethought capabilities are in contrast to the experiences of lecturers who felt disempowered and fearful about their abilities of using technology in the classroom as reported by Van der Poll (2014). Blackburn (2018) pointed out that mobility of technology does not limit it to the classroom setting which has increased students' self-regulation capability as they stated that they were now able to use technology at home, independently. Students' self-reflective capabilities indicated that they regarded ICT integration as a solution to their challenges in the classroom, a chance to feel accommodated and on par with their counterparts and had increased their participation. This supported the views that ICT integration is regarded as panacea to classroom challenges (Padayachee, 2017); it supports different style of learning for those living with disabilities (Francis, 2017); and it enhances comprehension of information (Blackburn, 2018).

4.2.4.7 Interpretation of Students' Fundamental Capabilities towards ICT integration

Learning using ICT tools and interacting with other students and lecturers has transformed students' academic and social lives (Ali, 2017). ICT integration gives them independence, especially those living with disabilities, to perform tasks on their own without supervision. Their perceived self-efficacy, which is described by Bandura (1994) as an individuals' belief in their capabilities to produce the required level of performance, has improved as they do activities such as research and assignments in class and at home. It has made them feel psychologically empowered which refers to personal perceptions of feeling competent, self-determined and having meaning in life (Healy, 2017). Recording sessions in class using voice recorders, taking pictures of notes on the board so that they can focus in

class, using search engines, and using assistive devices has made them feel empowered. Even though the learning environment is not completely fulfilling in other subjects, students' experience is more dynamic in those classes that integrate ICT. Ndlovu and Moll (2016) posited that ICT integration is meant to enhance the teaching environment to give students a fulfilling learning experience.

4.4.3 Theme 3: Behavioural Perceptions of Students about Using ICT

Behavioural perceptions refer to students' behaviour in carrying out activities such as learning, working, interacting, playing games and gamification that demonstrated how they perceived ICT integration. Behaviour is defined as an individual's actions or activities that are consciously and unconsciously displayed and are functionally mediated by stimuli (Kidd-Smithers, 2016; Uher, 2016). Perception is defined as the process with psychological and physical dimensions for individuals to understand, select, organise and interpret information and stimuli in order to respond or take actions with respect to the stimuli (Goldstein & Brockmole, 2017; Ou, 2017). The research explored types of ICT devices and applications students use and purpose for usage to understand their behavioural perceptions.

4.4.3.1 Types of ICT Tools that students use and are exposed to

The tables below indicate the responses of students about the type of ICT tools they always use, sometimes use and never used; and those they are exposed to which are used by their lecturers.

Table 4.3.: *Technologies that students and lecturers use in their classrooms*

TYPE	*Technologies that students use in their classrooms*			*Technologies used by lecturers for teaching and learning*		
TECHNOLOGY	**ALWAYS**	**SOMETIMES**	**NEVER**	**ALWAYS**	**SOMETIMES**	**NEVER**
Computer/ Laptop	5	11		3	13	
DVP		4			6	10
Voice Recorders	4		12			
Smart Board					2	14
Tablet			16			16
Cell	3	11	2		9	7

TYPE	*Technologies that students use in their classrooms*			*Technologies used by lecturers for teaching and learning*		
phone/Smart phone						
Virtual Reality		2	14		2	14
Special Scanners				2	2	12
Smart Television						16
Microsoft Office				9	7	
Reader Pen/C-Pen	1	1				
JAWS		1		1	4	11
Advance Electronic Braille Machine	1					

The table indicates that all students had not used tablets but they had all used laptops and smartphones. The use of assistive devices depended on the disability of the student. For example, students living with dyslexia listed reader pen/c-pen and those living with blindness preferred JAWS on their laptops. All students indicated that their lecturers did not use tablets or television in the classroom and the use of other devices fluctuated. Only two students had been in a classroom that used smartboards. Others also indicated that they used smartphones to interact with lecturers and other students on different platforms such as WhatsApp groups that some lecturers created.

> *N6S3-IIIP: Okay, so we have group chats on social media platforms like Facebook and also WhatsApp, so, they use applications like PDF and DOCS to send us question papers …..so that we can practice with it.*

During data generation, I observed a lecturer communicating with a group of students using WhatsApp. Some students listed WhatsApp and Facebook as applications they were comfortable with in addition to devices and applications they were comfortable with and were using in their classrooms.

Table 4.4.: *List of devices and applications that students are comfortable with in the classroom*

Technology Devices			Software/Application	
Type	**Number of Students**		**Type**	**Number of students**
Laptop	15		Microsoft Word	12
Smart phone/Cell phone	15		WhatsApp	12
Reader pen/c-pen	3		Microsoft Excel	8
Printer	3		Microsoft PowerPoint	8
Voice recorder	1		Google	5
Braille devices	1		Facebook	4
Photocopying machine	1		Microsoft Access	3
Smartboard	1		Microsoft Office	3
Virtual reality	1		JAWS	2
			Internet	2
			Outlook	2
			Dragon	1
			Braille software	1
			Zoom	1
			DOCS	1
			PDF	1
			ZoomText	1

Even though students were aware of the variety of technologies available, they were not using some in class but stated that they wished to use them. There was no uniformity in the type of technology that students and lecturers used; however, they further elaborated on why they were comfortable with their choices.

> *N6S2-IIIP: They make it easier for us to access documents, like printing our documents, eh, for smartphones you are able to google info and it's accessible right there and then; and laptops you can type whatever you need at that moment*

> *N6S4-IIIP:..with the reader pen, it makes it easier when I'm, eh, when I'm trying to listen and copy because I can't copy and listen, ….I am able to go to the dictionary*

of the reader pen and find the word while listening …. I'm able to then record the lecture while he's presenting a lesson.

A blind student explained that when using JAWS, he had to navigate using the keyboard keys but some lecturers preferred using the mouse and as a result they did not allow him to use his laptop and told him that they were using a mouse.

NCVL4S1-IIIP: Mostly if they do not allow me to open the computer, they said they use a mouse more than the keyboard because always we are using keyboard, key strokes, eh, the lecturers, mostly they have a challenge with the keystroke, mostly they are using mouse to navigate.

4.4.3.2 Purpose of ICT usage by students

Students stated that they used technology for communication purposes and school activities such as assignments, research, sharing of documents with lecturers and peers including previous question papers as well as group discussions.

N6S5-FGP: Our cellphones we used mostly for calls and social media, then laptops, some of us who do have laptops, eh, we use it for school work.

N6S6-FGP: Eh, we use it to communicate with other students and sometimes also to communicate with lecturers … and also to share some work.

N6S1-IIIP: …when doing your assignment, with technology, you can do research. And if, with assignment, let's say for example, you don't understand something, you can be able to connect with someone who will be able to help you, … for example pictures of certain, eh, eh, project that you are working on, with technology you can be able to use internet to be able to get whatever that you need, … I guess with assignments it helps us a lot to be able to practice.

NCVL4S2-IIIP: Siyaresearcha [We research] kwi-internet [on internet]. And then we are always ku-Google [on Google] to find valid information. Google for information nami ezongenza ukuthi ngi-improve, ngi-understand ukuthi i-assignment ingani. [Google for information that will make me improve and understand what the assignment is about]

During Covid-19 pandemic, students could not attend classes but in keeping up to date with school work, lecturers sent them work, including assignments, using WhatsApp for the most part.

> *NCVL4S2-IIIP: I think for this COVID-19 kuzoba [it would be] much easier because abafuni [they don't want] ukusipha [to give us] wona [them], eh, ama-assignments [the assignments] ngezandla zabo [using their hands]. Some bazitshela [tell themselves] ukuthi [that] ba-prifela [they prefer] ukuthi [that] basisendele [they send them] kuma [via] WhatsApp, and thina [we], we just submit the assignments.*

Students also stated that they used technology a lot among themselves to discuss school work and help each other with revision during Covid-19.

> *Researcher: So, as students you discuss the question papers using technology?*
>
> *N6S3-IIIP: Yes, using technology, since it was the only thing that connected us during this pandemic...*

For some students, use of techology was limited to certain classes and subjects but for those living with disabilities use of technology is for every aspect of their schooling and personal life.

> *NCVL4S7-FGP: We use technology when we are in the computer lab. We use technology for LO.*
>
> *NCVL4S8-FGP: To assist me in terms of studying and reading because as a blind person I can't able to study without technology. Technology is a tool that is assisting me….*

4.4.3.3 Summary

Students used different devices and applications to share documents such as previous question papers; to communicate and interact with other students and their lecturers, especially during Covid-19; for research and assignments; to help each other with assignments and revision; receive updates and update each other about news during lockdown due to Covid-19; and for social interaction. These findings supported those posited by other researchers to emphasise that students use

different devices and applications according to their needs and subject matter which differs from one student to another depending on the type of technology as well as the purpose of using that particular device or application (Addam, 2014; Benin & Murray, 2013; Mir & Shakeel, 2019; Padayachee, 2017). In addition, findings indicated that guidelines were urgently required to enhance pedagogy as asserted by Padayachee (2017) because acquisition and use of technology tools in the classroom depended on the lecturer's capabilities and choices, with no uniformity as indicated by different types of technology that students are exposed to their classes and those used by lecturers in table:3

4.4.3.4 Interpretation of Behavioural Perceptions of Students about using ICT

Students' behavioural perceptions indicated that they used technology tools to gain more insight into their subjects by interacting with technology as well as using the devices to interact with their lecturers and peers as they should. ICT usage supports creation, application and reuse of knowledge (Gkoumas, Gausz & Vas, 2016). Importance and usefulness of technology was emphasised during the Covid-19 pandemic. Another conclusion that can be drawn from the findings is that, if there were proper guidelines and uniformity, at least all students, especially at an exit level like these participants, would have experienced and used similar devices and applications if they were doing the same programme but it was not the case in this institution. Assistive devices were distributed according to the disability of the students. While all students did computer subjects, some were taught by lecturers who used technology tools like projectors to explain things while others had never experienced the use of such tools. Students were not sure whether it was up to the lecturer or whether it was because of lack of resources

4.4.4 Theme 4: Role of ICT on Students' Academic Performance

This theme focused on the views and perceptions of students by exploring the role of ICT; the result credited to ICT integration and interventions that the institution put in place to enhance their academic performance.

4.4.4.1 Sub-theme 1: Perceptions of students regarding ICT role on their Academic Performances

Some students reported that they witnessed improvement in their academic performance but it was high on computer-related subjects because that was where they used ICT more often, compared to other theory subjects.

Researcher: Has there been any difference in your academic performance since you started using ICT in your studies?

N6S2-IIIP: Yes yes, during Computer Practice, my marks have gradually increased, from the previous semesters.

Even though some students did not credit ICT directly for their improvement in marks, they stated that using ICT for revision, sharing previous question papers and discussions with class mates and lecturers on the group chats on social media, had assisted them to understand better and when they understood better, they performed better. Those living with disabilities also stated that with ICT they were able to study independently.

N6S3-IIIP:.. if there isn't any ICT involved then we would be lacking behind, we fall behind with school things, so at least if there is apps that they use to help us learn

Researcher: How do they do that?

N6S3-IIIP: Okay, so we have group chats on social media platforms like Facebook and also WhatsApp, …

N6S4-IIIP: I believe, it has changed my results quite a lot because now I'm able to study on my own, I'm able to write assignments on my own, unlike previously, I will have to wait, like literally wait for a lecturer to be available for me to get help to write my assignments or to understand previous question papers. …It has given me independence in a way….unlike when I had to wait to get a scribe for almost three months. ….I can scan the book with the pen and then listen to the book at home.

NCVL4S4-IIIP: Eh, I get more marks because, eh, if I use ICT, I can read without, without disturbance, … I can read, I can understand, eh, I can understand if I use ICT, so, if I understand it means I'm going to pass...

Participants indicated that they struggled at first but after understanding the use of technology, their marks improved.

NCVL4S3-IIIP: Uhm, I'm passing more because at first I was struggling a bit. But as time goes by, I was able to do, to print myself, I was able to, to open, to type, to do certain things.

NCVL4S4-IIP: I pass. I get more. If you did not use, you didn't use a computer before, it's your first time, eh, obvious you, eh, you can be nervous…

Students also believed that integrating ICT in the classroom gave every student a chance to do better in their academic performance. Even those who might not have had technology such as a laptop at home did not feel left out when they were in class because they also got a chance to be exposed to a variety of technologies and by so doing, they stood a better chance to do well in their final examination.

NCVL4S3-IIIP: Uhm, I will say, eh, students are benefitting. Why? Because, uhm, at first we are not from, ah, ah, uhm, the similar, eh, family background. Uhm, some students, ah, ah, ah, were not fortunate enough to have, uhm, certain technologies, so, uhm, ehm, at school we are exposed to use, eh, laptops, computer, and how to, how to type, how to work, how to open a certain document, how to print and so on.

NCVL4S2-IIIP: …….. with technology ngithola [I get] ama-marks [marks] are more extra because, kuma [in] spelling checks sengiyakhona [I am able] ukuchecka [to check] ku-laptop [on the laptop].

Moreover, students believed that ICT made information easier to access and simpler to understand. It gave them the opportunity to access vast amounts of information and that helped them to do well in their assignments.

NCVL4S3-IIIP: Ah, uhm, closer because, ah, easier again, ah, because, ….if I have an assignment, I'll use eh, internet on the, on my cellphone or in the, on a computer.

N6S2-IIIP: It makes everything possible, I can say, cos, if you want info, it's easy to access it through whatever gadget you have through the internet and the access of Wi-Fi makes it much more easier.

N6S1-IIIP: …via the connections of the laptop, let's say for example you can send the document via Bluetooth or mainly you can send the document via an email which make things much easier and faster, and it also saves time.

4.4.4.2 Sub-theme 2: Results credited to ICT integration

Students stated that ICT tools were used a lot in computer-related subjects and they obtained high marks; however, in analysing the general statistics of students' performance of the college, Life Orientation as a subject had a high performance from Level 2 to Level 4 as alluded by students with percentage of 96.6% for level 2; 95.5% for level 3 and 90.3% for Level 4 in 2019 based on the number of students who wrote final exam in that year. The performance of students on Computer Practice (CP) at N4 level, Introductory Information Processing (IIP) N4 and Information Processing (IP) N4 was high but it gradually decreased and at the exit level (N6), the failure rate for CP N6 and IP N6 was high. The number of students enrolled in N4 level was higher than the number of students enrolled for N6 and the pass rate between 2016 and 2019 ranged between 74.6% and 89.2% for CP N4; and 72% and 71% for CP N6; and between 90% and 92.1% for IP N4 and as low as 38.4% for IP N6.

Based on these statistics, the assumption could be that in the lower level of NATED computer-related subjects, students were coping with the work but with each level the subjects became more difficult for them.

4.4.4.3 Sub-theme 3: Perceptions of students regarding current ICT interventions

Learning facilities and resources impacted students' academic performance. Other researchers attested that there was a positive correlation between the academic environment and facilities such as libraries, computer labs, textbooks, and technology resources (Mushtaq & Khan, 2012; Ndlovu, 2018). When students were asked about the interventions that their institution had put in place, their responses included a library, a well-equipped resource centre, Wi-Fi and assistive devices for students with disabilities as resources that would assist them in their studies.

N6S5-FGP: They did intervene because right at the school we have library, resource centre and Wi-Fi so that we can do researches, and be able to connect to Wi-Fi and do some research

NCVL4S7-FGP: With laptops and the technology that we get from the resource centre, I think it's making a huge difference ma'am for us.

NCVL4S8-FGP: Right now … we do have Wi-Fi, we do have resource centre and that are some of the elements that are assisting us as students but in future they have to put, they have to intervene more than they do now.

One participant mentioned the bursary scheme, NSFAS, as one of the interventions that was in place to assist students. This might not be seen as an intervention that was put in place by the college; however, according to the attendance policy the disbursement of tuition, travel and accommodation allowances was intended to promote student attendance and ensure students' academic performance; moreover, the disbursement could be stopped on the recommendation of the institution if the student was not adhering to the attendance policy guideline of 80% minimum since the disbursement was done in tranches and could only be done after thorough analysis of student's attendance record (DHET, 2013a). In light of this background, NSFAS was an intervention.

N6S6-FGP: …….they do have resource centres, ehm, what we have, eh, is NSFAS, ehm, and yes there could be some improvements but I feel like we have those, eh, the ones that we have, eh, currently we have Wi-Fi, eh…

The students living with disabilities also acknowledged the interventions mentioned by others but added the DU as another intervention. However, they felt that there was lack of communication between the DU and the lecturers at the college based on their experience in class.

NCVL4S7-FGP:..we do have a disability unit, and I don't think our lecturers and our, eh, what you call, the people who are working at the disability unit do talk, I think if they could work together ma'am and understand that there are learners with disabilities, eh, learning difficulties and learners that cannot read and work together ma'am, I think that can be much, much more better ma'am.

According to the students, the DU was aware of their disabilities but the lecturers seemed not to be aware or did not know how to accommodate them.

NCVL4S5-FGP: ……we have resource centre and library to get information but there could, they could use more things like projectors, voice something, eh, as much as I have hearing problem, it will be much convenient.

NCVL4S7-FGP: If they could work together ma'am because of, you would go to a class ma'am and the lecturer would explain for the sake of that 'I went to the university to do this, I don't have time to nurse people who come to me and say 'Ma'am, I have a problem with dyslexia or what, or what' they would just tell you that 'nnah [me] I was taught, I trained to teach students, not special students'.

4.4.4.4 Summary

The findings in this study supported the results of other researchers (Addam, 2014; Ali, 2017) and indicated that students believed that their marks gradually increased; interaction with lecturers and peers improved through the use of social media and group chats; ICT made it easy for them to do revision by sharing previous question papers; intellectual levels improved because they understood better the content presented in class; self-esteem improved and they were able to work independently, especially those living with disabilities who could do assignments without waiting for scribes; class attendance improved because in the classroom they were exposed to a variety of technologies that they did not access in their homes; knowledge improved because they were able to access vast information on the internet; study habits changed for better by saving time and working faster in doing assignments and sending or receiving documents and information. Based on the findings, ICT enhanced their academic performance.

4.4.4.5 Interpretation of Role of ICT on Students' Academic Performance

Students regarded ICT integration as a positive influence on their academic performance. According to Bandura (1994), students' aspirations, levels of interest in academic activities and accomplishments in learning are affected by their beliefs in their capabilities to master those activities. Therefore, because students believed that ICT enhanced their academic performance, their capabilities to master activities that were used to measure academic performance were impacted positively. Tasks,

activities or assessments like examinations or test or assignments are used as instruments to determine academic performance and require cognitive processes (Lamas, 2015). Moreover, to judge quality of education holistically, it is imperative to determine whether students are gaining competency, confidence and the healthy development they need to succeed in life and to check whether the education received makes them feel empowered or not (Donald et al., 2014). ICT integration gave students the knowledge, skills and confidence to work independently and efficaciously.

4.4.5 Theme 5: Challenges Experienced by Students During ICT Integration

This theme and its sub-themes focused on the perceptions of students about challenges they encountered and disadvantages of ICT integration.

4.4.5.1 Sub-theme 1: Perceptions of students about challenges of ICT integration

Students raised a number of challenges, such as network failure that they experienced during ICT integration but some believed that the “users” (students) could forget the instructions and in that case, the challenge was not external. Other students felt that resistance to change by students and lecturers was one of the challenges.

> *N6S1-IIIP: Um, the challenges that I encounter, most of the time let’s say, it might be the shutting down of the system, or it might be the network when we have to print, and, but mostly I can say it’s the user challenges, cause if I fail to remember something, I will be the one encountering the challenge to remember how to solve that problem.*

> *N6S2-IIIP: …other people don’t adjust quickly to change, so resistance to change can be a challenge. Cos, some will think why new technology, rather the manual one that we are used to not looking that things are changing already technological.*

> *NCVL4S2-IIIP: Ngiba ne-frustration if into angiyi-understand [I get frustrated if I don’t understand something]*

Other challenges included poor network connection, load shedding, time, using personal data when they were doing research at home and viruses. Students living

with disabilities who were using tools like JAWS and voice recorders listed noise levels in the classroom because they had to rely more on listening, especially the blind students.

N6S3-IIIP: Since it requires a lot of network to at least access the technology and ICT, if there is no Wi-Fi available, then we are not able to connect with what is going on.

N6S4-IIIP: Hey! Time. I think time is one of the biggest challenges that we encounter when having to use technology in class because in most of the time your lesson might be for 45 minutes…..

NCVL4S1-IIIP: …loadshedding, sometimes network is disadvantaging us to go forward with the lesson or to do something which is related to education...Another challenge is mostly data for research if you are no longer getting access to the Wi-Fi. And, another, it is very quick to get viruses, you cannot get access to opening your files.

NCVL4S3-IIIP: Okay, ah, I would say, maybe if we are having loadshedding. … I must always have a charger to charge my laptops if ever there will be power cut…

NCVL4S4-IIIP: When I'm using a laptop, …or voice recorder, the challenge you can get is if there is a noise in the class..If there is a noise in a class, eh, I can't manage to listen, to listen the JAWS. ….if there is not an electricity..

4.4.5.2 Sub-theme 2: Disadvantages of ICT integration

The disadvantages included losing their work because they forgot to save on a computer and they had to do the same work again or when there were electricity interruptions and as a result, the laptops had not been charged and classes had to be cancelled or the network was not connecting. Some mentioned failure to connect to Wi-Fi at the time when they needed to.

N6S1-IIIP: But, let's see the disadvantages that can be there in class when using technology: charging the battery, it happens that the battery just dies and you have to find a charger…. that is a huge disadvantage cos, let's say the user didn't save the work, then the work is lost.

NCVL4S1-IIIP: Eh, disadvantages, eh, if your electricity is gone you cannot use it, if the network is not available you cannot use it, if eh, eh, what else, eh.

N6S2-IIIP: Then, disadvantages would be: not being able to access Wi-Fi connections, free Wi-Fi connections. Yeah, and sometimes it can be network coverage problem which can arise.

NS63-IIIP: I think it's Wi-Fi. Using of Wi-Fi. Because you can't use it anywhere when you want to, at any given time.

Others mentioned that ICT integration could disadvantage students who were not able to use it, while others stated it could be a distraction when students were not paying attention in class but were chatting with friends and family during class time.

N6S3-IIIP: Okay, if you do not have any knowledge at all of using technology then you've got a problem. For instance, maybe you need to download some applications or probably create some accounts and if you don't know any of those things it could really disadvantage you.

N6S4-IIIP: The disadvantage is that people tend to just, eh, focus on the phones, and the tablets and the computers and forget to concentrate. ….chatting with friends and family instead of listening to what's happening in class.

For other students, limited time was a disadvantage because their interaction with ICT happened only in the classroom and since all periods were time-bound, it meant when the period was up while they were still figuring out other steps, they were left behind.

NCVL4S2-IIIP: Disadvantages, eh, if I don't understand or eh, isikhathi sifike [time is up], eh, i-period iphele singakaqedi anything else [the period end before we finish], and then ngisemuva [I am behind] toward everyone eklasini [in the classroom].

4.4.5.3 Summary

Some challenges and disadvantages raised by students were similar to the findings stated by other researchers such as insufficient time in one lesson to understand what was taught and master the use of ICT which supported the utterances made

that use of ICT was time-bound and some students could only access these tools when they were in the classroom (Ali, 2017; Padayachee, 2017). In addition, electricity interruptions known as load shedding in SA (Kilfoil, 2015), poor network connections, coverage, broadband, low bandwidth speed (Mkhize, 2011; Van der Poll; 2014) were identified as disadvantages. However, there were new challenges that were stated by students such as a lack of knowledge by users (students), resistance to change and adapting to use of ICT by both students and lecturers, failure to connect to Wi-Fi, unaffordability of data by students when they had to use their personal technologies to do research, viruses, distractions in class by those who used ICT for socialising during lesson time and noise interruption for students using assistive devices such as JAWS and voice recorders. According to Mbodila et al. (2013), the use of the English language was a challenge in ICT integration although no student raised an issue with English even though it was the second language for all students who participated in the study.

4.4.5.4 Interpretation of Challenges Experienced by Students during ICT Integration

Challenges and disadvantages listed by students indicated a lack of resources, infrastructure, funding and inconsistency in the integration of ICT. This view supported the findings stated by other researchers (Padayachee, 2017; Mukhari, 2016; Van der Poll, 2014).

4.4.6 Theme 6: Benefits of ICT Integration Experienced by Students

This theme and its sub-themes focused on the benefits and advantages, as perceived by students, regarding ICT integration in their classrooms.

4.4.6.1 Sub-theme 1: Perceptions of students about benefits of ICT integration

Students believed that ICT integration was beneficial to all students whether they were living with a disability or not. Even though they acknowledged that it made life easier when they had to do their assignment and research, they also associated it with finding a job in the future. Many students believed that they needed the skills to operate technology devices like computers in order to get employment.

> *N6S3-IIIP: Since we are using ICT now ma'am, when we are already employed in other companies it would be easier to use technology without any problems…*

However, for the students living with disabilities, ICT integration meant an opportunity to be on par with other students in the classroom since many of them believed that their disabilities disadvantaged them because many lecturers did not understand how to accommodate and teach them in an inclusive classroom.

NCVL4S4–IIIP: I benefit …. because technology makes things easier for me... Eh, like if I want to, I want to write, I can't write, I can type and send to the people I want to. In the future it helps me because, eh, when I am in the work, in the workplace I have to use technology, eh, I have to use laptop with JAWS because I can't, I can't write. I have to use laptop, I have to use voice recorder if there is, if we were in a meeting, I have to record the thing and then if, like if, if I take minutes in a meeting I have to record everything, after that I have to, after that I have to, I have to type the minutes that I was taking from, mhm, from voice recorder.

N6S4-IIIP: ICT for me as a student is beneficiary… I'm able then to record the lesson, or take a video of the lesson, and then it means I do not get a chance to miss out …while recording the lesson …if I find myself missing out on whatever that is said, I will go home and listen to it. And I will take pictures of whatever that was written …..

NCVL4S1-IIIP: Eh, if they are doing Microsoft Word, I am going to do Microsoft Word like the same. Especially in all the programs of the computer, I am doing the same like those other people in class.

4.4.6.2 Sub-theme 2: Advantages of ICT integration

For students living with disabilities, the advantage of ICT integration was that they could participate in class like other students.

NCVL4S4-IIIP: … the advantages is if you use, eh, eh, technology in a, in a classroom, eh, me as a blind person, I can, eh, I can understand what is going on in the class but if you do not use a technology, eh, it's going to be difficult to me, ma'am, to participate….

NCVL4S2-IIIP: Okay, advantages i-understanding [it's understanding], learning and then noku-progressa eklasini [and progress in class].

The other advantages included quick access to information, easy communication with other classmates even after school and easy to use for their assignments and other school work.

N6S2-IIIP: I'm able to access info which I never could get through a library.

N6S3-IIIP: So, definitely acquiring a lot of information is what technology helps us with.

NCVL4S1-IIIP: Advantages is to get information faster, you can communicate with someone about technology, …. you can get, eh, information regarding your subject ….

NCVL4S3-IIIP: Okay, advantages are: it is easy, it is easy to use laptops and uhm, it is easy to use.

4.4.6.3 Summary

Findings revealed that when ICT was integrated, it assisted students to gain access to information that they could not get in class or library, with a click of a button on their devices. Lessons were interesting and understood by students and ICT allowed students living with disabilities to feel accommodated and on the same level with other students. Furthermore, students focused on the lessons without worrying about taking notes because they could record the lectures with their devices or take pictures or even have lessons sent directly to their devices at the end of the lesson. Students were able to do tasks or activities such as assignments without struggles and could easily communicate with lecturers and classmates. These findings support what other researchers stated regarding ICT integration accommodating different learning styles and removing barriers to learning for students living with disabilities. ICT integration accommodated different levels of understanding, improved learning experiences of students and improved participation, knowledge retention and interaction (DoE, 2004; Mukhari, 2016; Ndlovu & Moll, 2016).

4.4.6.4 Interpretation of Benefits of ICT Integration Experienced by Students

Benefits and advantages indicated that inclusive classrooms in which ICT was integrated accommodated the diversity of students and their different learning needs. This supports the views of other researchers (Ali, 2017; Mir & Shakeel, 2019) that

ICT tools support different methods and styles of teaching resulting in students grasping the information and enhancing learning with its variety of programs.

4.4.7 Theme 7: Perceptions of Students about Lecturers' Capabilities to Model ICT Usage and Facilitate Effective Integration

In a social setting such as a classroom, the SCT posits that lecturers and peers play an imperative role in modelling behaviour for other students to observe and copy (Bandura, 1989). Hence, the study found that students had certain perceptions relating to lecturers' capabilities to model ICT usage and facilitate effective integration as presented below. The role of lecturers, the strategies they used and support they gave to students and the perceptions of students about fear of using ICT and the digital gap between students and lecturers were explored.

4.4.7.1 Sub-theme 1: Students' perceptions of lecturers' role in an inclusive-ICT-integrating classroom

Some students believed that all students were accommodated based on their observation of assistive devices that were given to students living with disabilities.

> *Researcher: In your opinion, are students' needs accommodated in an ICT-enabled inclusive classroom?*
>
> *N6S5-FGP:.. I think they are accommodated, cos, eh, for example, there was a learner with, eh, eye sight problem in my group neh, and when, eh, we do practical, yes, they were able to assist him, and when we were doing, eh, like reading books and stuff, he didn't have a book to read, they gave him something like to record whatever that the lecturer is saying….*
>
> *N6S8-FGP: ….students that are, that have disabilities, they are catered for ma'am because in my class we had, eh, one, one student that was, I don't know if he visually, he couldn't see properly, but the student was catered for ma'am, he had his own laptop ma'am and he also had like headsets ma'am to connect to the laptop ma'am.*

On the contrary, those living with disabilities disagreed and stated that understanding the type of disability that each student had would help in allocating the correct technological resources to students.

NCVL4S8-FGP: I think there is no technology that is accommodating all of us except, eh, a computer, laptop to assist us…

NCVL4SS7-FGP: There is this disability called dyslexia ma'am, and the computers are not made for, they are not specialised for certain people or certain, eh, can I put it categories...

Students believed that the institution had put measures in place to accommodate all students in the classroom by making the resources available but the individual lecturers did not have the strategies or techniques to teach in an inclusive classroom.

NCVL4S8-FGP: Ma'am, I don't think they do have strategies of accommodating all of us, those who have special needs and those who don't have special needs. I think they are just using their lecturing strategies that they have been taught from the universities …..So, I think they don't have strategy.

N6S5-FGP: …they don't have a strategy that they lecture because they only use board and laptops when we are in practical classes and in theory classes they use board to explain and stuff.

N6S6-FGP: … they don't have a strategy, strategy because they only teach, even if we don't understand, they maybe refer to the board to try and explain, yah, that the only way, if that is the strategy.

NCVL4S7-FGP: They are teaching because "I was trained to teach, not to teach special students" and some lecturers, they really accommodate us using projectors. Ma'am, I will say only 10% will accommodate us using, eh, projectors…

The views of students about the support or lack of support they received from their lecturers differed. Some stated that they were happy with the support but others, even though they acknowledged that they received support, felt that the support was insufficient.

N6S5-FGP:..according to me, ma'am, they do support us, we do support each other, and the lecturers, when you don't understand they do come and show you what you must do.

N6S6-FGP: Ah, ma'am, we do get support from our lecturers. Sometimes it's not enough but we do get support.

N6S1-IIIP: ……. when you have forgotten something, the lecturer will help you remember but not do it for you, so, that is the most grateful support that I am always appreciative of.

However, students with disabilities felt that the lecturers did not understand their disabilities and did not have strategies to integrate ICT in teaching them. They preferred to be assisted by their peers rather than their lecturers. Some lecturers focused on the majority of students who were not living with disabilities and once those students understood what the lecturer was teaching in class, they would then continue with the next topic thus leaving behind the students living with disabilities.

NCVL4S2-IIIP: Support, eh, i-support [support], I will say, I will rate it 40%, also it depends ukuthi ubani okusizayo [on who is helping you], but for me towards ama-lecturers [compared to lecturers] I prefer ukusizwa ama-classmates [to be assisted by my classmates].

Researcher: Okay. Why?

NCVL4S2-IIIP: I said ama-lecturers [lecturers] I think ukuthi [that] aba-understand [they don't understand] what is disability, bona [they], they think ama-disability ayafana [all disabilities are the same], basi-rater [they rate us] the same as the blind students.

NCVL4S8-FGP: I don't get proper support from the lecturers, eh, that teaching myself, eh, a computer other than getting that assistance from my, my, my friends where we are studying together because lecturers they say, they don't have strategy, they don't know how they can teach a blind person….. they are not helping me.

Researcher: What sort of support would you like to get?

NCVL4S8-FGP: Eh, the support I need from the lecturers is to make sure that they don't leave me behind, they must make sure that they go with me, eh, I go in the same pace with the other, eh, who are not living with disability. Because some

of the lecturers, if those who are not living with disabilities, they understood, they move on.

Other students suggested that they received support because they were open about their disabilities to lecturers and peers and made them understand what sort of support they needed as students. In addition to the support they received in the classroom, they also received support from DU. However, other students stated that, even though lecturers were aware of their disabilities, they were still not able to support them fully because they lacked knowledge of the ICT applications or software that these students used, such as JAWS.

NCVL4S7-FGP: For me personally ma'am, I think I get support from both my lecturers and my peers. Because I was able to tell them about my disability, where do I lack, I think I do get. Even ma'am, eh, disability unit ma'am, I do get support ma'am.

NCVL4S4-IIIP:…. if a lecturer doesn't know how to use JAWS it is a problem, ma'am. That's the problem I saw because you find that the lecturer doesn't know how to use JAWS.

The majority of students who were not living with disabilities were happy with the support they received from their lecturers. In addition, they stated that when their ICT tools were giving them challenges, the IT personnel were called in to assist them.

N6S2-IIIP: The help we get is, there are technicians who are called in to assist with the challenges that we may come across.

N6S3-IIIP: … let me just say probably retrieving some files, if we do know how to retrieve them they help us with them or if they themselves do not know they call ICT sorry the IT people to help us with fixing or rather helping us to get whatever it is that we want from the laptops.

N6S4-IIIP: In class, we call IT guy.

4.4.7.2 Sub-theme 2: Perceptions of students about fear of using ICT and digital gap between students and lecturers

The students acknowledged that when they were using the ICT tools for the first time they were nervous.

Researcher: Do you think there are students and lecturers who experience fear of the unknown when it comes to technology?

N6S4-IIIP: Yes, definitely. Hawu! Yes. A lot, a lot.

NCVL4S3-IIIP: Yes, ma'am. Uhm, like at first, eh, like at first we were, eh, some students were, uhm, they didn't know on, on how to, to, maybe to switch on, to do certain things, maybe open up a word document. Yes.

NCVL4S4-IIIP: …. you can be nervous but not, eh, maybe for 2 days, 3 days, after 3 days, 4 days you are, eh, you can be fine ma'am.

Some believed that students who were at private schools or former Model C schools had access to a variety of ICT tools and when they reached college, they were more familiar with the tools which meant they did not get nervous when they had to use technology.

N6S3-IIIP: Since some of us do not come from probably Model Cs, Model C schools where at least there are these, will probably be scared of what people will be saying since others do know how to use it.

Other students believed that older lecturers might be scared to use technology because they had not been not exposed to it, or they preferred using textbooks as resources instead of technology because they were familiar with books.

N6S1-IIIP: …..if there was a lecturer who was old they would find it hard to work with technology since they always find it like, it's hard to learn and adapt..

N6S2-IIIP: Because some would say, "I am comfortable with, eh, the basic teaching process which I am using now than upgrading to one of using technology".

The students suggested that the solution to eliminating the fear of using technology for both students and lecturers was for them to use it.

N6S2-IIIP: Mhm, I think a step-by-step introduction of technology can help, …up until the person is used to the whole concept of technology integration. I think the government can help through that and also individuals have to have the willingness of learning more.

N6S4-IIIP: I think the solutions really starts with the lecturers. In terms of the lecturers, they will need to get trained, in terms of the technology and how it is used. And then the students will need to be using it more. Practice makes perfect..

With regard to the digital gap between students and lecturers, some students believed that there was a gap.

NCVL4S3-IIIP: Because, ah, ah, our generation, our generation is more exposed to, uhm, advance technologies.

Some students implied that lack of consistency and uniformity was the reason why some lecturers continued with traditional methods of using texbooks.

NCVL4S1-IIIP: …I mean they use a textbook more than the technology because there is no certain compulsory to use technology except when they photocopying or printing..

N6S2-IIIP: Cos, lecturers, I think they prefer the basic part of teaching than the new technological process of teaching.

However, some students associated the digital gap with the age of the lecturers. The older the lecturer, the bigger the gap.

N6S4-IIIP: There's lecturers who went to, who, who became teachers, ahm, a long time ago... lecturers are, are a bit behind when it comes to technology compared to the students.

N6S3-IIIP:.. we as students are in a world that already has advanced technology, so, I think it is a bit easier for us to get to use it other than the lecturers who were born back in the era when technology probably didn't even exist..

NCVL4S4-IIIP: …students, they are familiar with technology because, mhm, the lecturer who are teaching us, they didn't use, they didn't use, eh, a technology before...

When students were asked what could be the solution to close this gap, they suggested that lecturers must be exposed to ICT and be trained.

N6S3-IIIP: … they should plan programmes where they teach them, … how to broaden their knowledge or equip them rather with the knowledge that they do not have

N6S4-IIIP: It's for the lecturers to be a bit open, to being taught.

NCVL4S4-IIIP:.. to help the lecturers to be familiar with the technology they have to use it always ma'am.

NCVL4S3-IIIP:.. there should be more, ah, more classes, more classes or workshops for lecturers, yes, where they would be trained, yes.

N6S2-IIIP: I think it can be closed by giving lecturers ah, more training in technological learning and teaching processes, and it will give them, the, like, that drive to want to learn more for them to be able to teach through technology.

4.4.7.3 Summary

Findings revealed that students acknowledged and appreciated support that lecturers gave but they were not satisfied with the capabilities of lecturers to model ICT and integrate it effectively. Students seemed to believe that lecturers either lacked pedagogical strategies or they were resistant to change and preferred old methods of teaching. This supported findings of other researchers that students were excited to use ICT but lecturers' passive resistance resulted in very low consumption (Dube & Scott, 2017; Sakala & Chigona, 2017). The classroom environment allowed students to model what they had learned and assisted each other even though not all lecturers used ICT in their classroom (Mthelebofu, 2018). This meant that students mostly observed their peers rather than their lecturers which is in line with Bandura (1977) who stated that models to be observed could be peers. Students could be classified as digitally wise instead of digital natives because most of them

encountered ICT tools at TVET college and used them for many aspects of their lives (Prensky, 2009).

4.4.7.4 Interpretation of Perceptions of Students about Lecturers' Capabilities to Model ICT usage and Facilitate Effective Integration

One of the barriers to ICT integration was identified as a lack of skills of lecturers to use the technology (Ali, 2017). This study revealed that ICT integration challenges lecturers to have knowledge, skills and competencies to: choose correct ICT tools that could accommodate all students; understand different disabilities and variety of ICT tools; create pedagogical strategies that included ICT tools while accommodating all students and taking into consideration their disabilities; and continuously attend professional development training to keep up to date with ICT tools for inclusive classrooms. This is supported by the views of Samarakoon et al., (2017) that the ICT integration process required teachers to possess capabilities, skills and strategies to integrate ICT and adjust their pedagogy which depended on the competencies.

4.4.8 Theme 8: Students' Views on Guidelines for ICT Integration

Researchers like du Plessis and Webb (2012), Padayachee (2017) and Spencer-Smith and Hardman (2014) have emphasised the need for more research that can paint a picture of current ICT integration so that the findings could be used to formulate guidelines to effectively integrate ICT in SA's inclusive classrooms.

4.4.8.1 Sub-theme 1: Changes that students wish to see regarding ICT integration

Students wished to see changes and improvements that do not deviate from the curriculum but include tools and strategies to make learning enjoyable.

> *N6S2-IIIP: Mhm, I think it should be in line with the curriculum and make it easier for lecturers to adapt to it.*

> *N6S4-IIIP:.. first change that would need to be integrated is manner of the way the lesson is being handled. Eh, why I'm saying that is because most lecturers still hold a textbook, read from a textbook and then ask a question. ….You know when something is fun for you to enjoy. When you start enjoying the subject, then you really realise that actually there is nothing difficult about this*

The other participants stated that since many students felt positive about ICT, it should be compulsory for all lecturers to teach using it.

N6S5-FGP: …the Department of Education and the, the college must improve in theory and include ICT instead of lecturing with the textbooks.

NCVL4S7-FGP: … each and every subject that we do, we should like, we should, we should use laptops, ma'am like, more often every day….we must type our assignments, like do our classwork, like in typing ma'am, print it out….

Increasing the resources and equipment for all students seemed to be a concern for students and they wished to see all students at least having a laptop.

N6S8-FGP: Distribute gadgets ma'am, like laptops or, eh, yes, like distribute laptops for kids that do not have laptop at home.

N6S1-IIIP: I think if we can have enough, uhm, learning equipment, for example, laptops.

Students with disabilities felt that even the ICT tools that the intistution had were not used to the fullest by the lecturers.

NCVL4S8-FGP: … make sure that, eh, all the devices that can able to assist both students, with disabilities or without disabilities, eh, must put in place……like myself as a blind person, it must have the device that can be able to communicate with the board and plug in my laptop in order to get the notes…

N6S3-IIIP: … bring other equipment that are not available in our institutions.

Researcher: For example?

N6S3-IIIP: Smartboards, I think they should be available, I think there also should be Virtual Reality.

Students proposed that every classroom should be well-equipped with laptops and printers, including the theory classroom because these resources were only available in the computer classrooms. They also emphasised training of lecturers as vital not only on using ICT but in understanding different types of disabilities.

NCVL4S1-IIIP: They supposed to install computers in each and every class of the lecturer, each and any class of the lecturer they must put a computer inside and printers, computers, printers and photocopier. …give each and any student tablets or laptops, like, eh, multiracial school or private schools. Nowadays I see the private schools they get, eh, tablets….

NCVL4S2-IIIP: Eh, mabanga-trainer ama-lecturers [if they can train lecturer] with different types of disabilities and, eh, even though namanye ama-students engekho disabled [some other students are not living with disabilities], basitrithe [they treat us] with, eh, the same.

Other students were concerned about access to Wi-Fi and internet connectivity and therefore proposed that Wi-Fi connection should not be limited to "hot spot" blocks but the range should be increased for all students to be able to connect.

NCVL4S3-IIIP:.. if we get more access of the Wi-Fi because, uhm, uhm, some, some, some, uhm, assignments would want us to make research on certain things.

NCVL4S4-IIIP: Ah, okay, if they can allow students to use internet and Wi-Fi in the class, they can, it can, it can be better ma'am.

4.4.8.2 Sub-theme 2: Current limitations that students are experiencing

A number of limitations were listed by students which included students not being allowed to use cell phones in the classrooms even though some seemed to understand the reasons.

NCVL4S4-IIIP: Yes, there is a rule, immediately when you enter the class you have to switch off your phone… And it can disturb if it can ring inside the class, it can disturb.

NCVL4S3-IIIP: Uhm, we're not allowed to use our cellphones when we're in class. We are only allowed to use, uhm, maybe uhm, laptops, a certain time, maybe, eh, if a period is about an hour, we are only given an hour to use the laptops, and maybe, you, eh, eh, eh, few minutes on the internet.

N6S1-IIIP: ….we cannot use the cellphone in class, the laptop, we can use the laptop …. limitation to that can be the duration of the period…

There was no consistency in applying the rule about using cell phone in class. Some students were told to switch off their cell phones by their lecturers while others were told to put their phones on silent. Others stated the rule was that they could not go on social media when they were in class.

NCVL4S2-IIIP: The only thing that they would tell us sifake ama-phone ku-silence when singena eklasini [to put our phones on silence when we enter the classroom].

N6S4-IIIP: …you can use your phone but only if you are recording the lesson or taking a video of the lesson but not to go on social media and ah, and be chatting with your friends. I think the Wi-Fi is accessible when you are outside the classroom at a certain spot.

The limitation of Wi-Fi connectivity was also seen as a problem for students.

N6S3-IIIP: We can't use Wi-Fi anywhere at any time. In some blocks, here in our institution, the Wi-Fi doesn't work at all, so, you need to be at a place where there is Wi-Fi hotspot because it is not available all around the school premises.

N6S2-IIIP: Mhm, in my three subjects, it's, ah, technology is limited ….it's limit of forty-five minutes depending on the class, how long the class last. We use it to, eh, a minimum of using our smartphones when we're researching.

4.4.8.3 Sub-theme 3: ICT tools that students wish to use that they were not using

When students were asked what technologies they wished to use, their responses could be divided into two: the general technologies that almost all students wished to use and the tools that students living disabilities wished to use.

- General tools

The students mentioned the ICT tools that they indicated that they had never used. All students had never used both tablets and television; only one student mentioned television but they all mentioned tablets.

NCVL4S3-IIIP: Okay, I would say for now, eh, I'd say a tablet.

N6S1-IIIP: Tablets would also be more useful to students because ….they are portable for students who are not qualified to use the laptops.

Those who had never used projectors listed projectors; those who had never used smartboards mentioned them and those who had never used Virtual Reality listed it.

N6S2-IIIP: Okay, firstly, it would be the projectors, and TV, ah what do they call it- through the TV, learning through the TV, yes, a smartboard.

N6S3-IIIP: Smartboard, Projectors, and Virtual Reality

Researcher: Why would you want to use these technologies?

N6S3-IIIP: They will show us information that we don't understand in more detail since we will be seeing it, instead of just imagine it, how it can be.

- Technologies/Assistive Devices

The students living with disabilities listed the technologies stated under general but also added technologies that would assist them with their different disabilities and they all listed smartboards; software such as Dragon for students with dyslexia; Braille devices for blind students.

N6S4-IIIP: I'm not sure if Dragon is part of, eh, I think it's a technology.

NCVL4S1-IIIP: Eh, but, there is two technology which I want to use. There is, eh, a certain little bit of a notebook which are releasing from the Blind SA which are called, eh, eh, what do they call that little devices, I forget that name or that devices but they use a Braille and sighted in the same time. So, when I am writing as a Braille, eh, someone who can see, they can see as normal writing on the screen, but while… Another device is a tablet.

NCVL4S2-IIIP: Eh, Dragon. Benginayo [I had it] in my previous laptop.

NCVL4S4-IIIP: A smartboard ma'am. Yah, a smartboard.

Researcher: Why?

NCVL4S4-IIIP: Ah, because, eh, smartboard, I can copy notes from it ma'am, because I can't see. If you use a, a normal board, I can't see a normal board. If you use a smartboard I can copy after the lecture is done

When I asked one blind student why she did not mention any Braille devices, she explained that not all blind people were able to use Braille. It depended on when the person became blind and also if the person had learned to use Braille.

NCVL4S4-IIIP:….. if you get blind when you are, when you are older like me, you don't know, …eh, Braille, Braille …

4.4.8.4 Summary

The findings indicated that students believed that use of ICT made lessons fun and enjoyable which meant that ICT integration in all subjects meant that they would enjoy lessons. Textbooks were regarded as boring because lecturers merely read out of textbooks. This view supported the assertions made by researchers that outdated textbooks contributed to the failure rate in SA; students' academic experience could be positive with ICT integration; and appropriate mediation between ICT and students by lecturers would create active learning (Addam, 2014; Blackburn, 2018; Pholotho & Mtsweni, 2016). However, they were aware that use of ICT tools for teaching and learning should support the curriculum and enhance pedagogy and therefore wanted lecturers not to deviate from the content of the subject. This supported the assertions made by Ndlovu and Moll (2016) and Tamim et al. (2015) that ICT enhanced pedagogy to benefit students and that pedagogy was important in the successful integration of ICT. Inconsistency among lecturers seemed to be a major problem and policies that forced all teachers to use ICT in their lessons would, therefore, create uniformity and decrease inconsistency. At the same time, policies would assist the institutions to realise the need to train lecturers who lacked the skills and competencies to teach in an inclusive classroom and effectively integrate ICT.

4.4.8.5 Interpretation of Students' Views on Guidelines for ICT integration

Covid-19 revealed the urgent need for the use of ICT in teaching and learning. Therefore, educational institutions should also realise the urgent need to procure resources for classrooms, students and lecturers. This view was supported by a

number of researchers who mentioned that lack of resources had a negative impact on ICT integration (Mukhari, 2016; Nzembe, 2018; Pholotho & Mtsweni, 2016; Van der Poll, 2014). Students wanted lecturers with self-efficacy who would take time to prepare lessons and not simply read from the textbook in front of them in the classroom. They wanted lecturers who would carefully select the information that they wanted to teach; select the ICT tools they needed in order to present the lesson in an interesting, fun and engaging manner; think proactively and come up with different strategies that they could use in class to accommodate all students while using ICT tools selected, taking into consideration the different learning styles and disabilities of students in their classroom. This would also make the institution realise the need to purchase more resources for classrooms, lecturers and students and see the need to train those lecturers who are not competent to use ICT for teaching and learning. There should be no gap between students who attend private institutions and those in public colleges as far as ICT use is concerned. Limitations such as Wi-Fi coverage should be eliminated and Wi-Fi should be available over the entire campus. Rules concerning usage of cell phones and internet access in the classroom should be the same in all classes and enforced by all lecturers. All students should submit typed assignments for all subjects. As far as ICT tools are concerned, assistive devices must be purchased based on the needs and disabilities of the students but general tools must be similar in all classes.

4.5 CHAPTER SUMMARY

This chapter has elaborated on how data was analysed and all the steps that were followed including employing Atlas.ti. It used the voices of students and tables to explain the interpretation of findings. It also pointed out that students valued ICT and considered it imperative for teaching and learning. It presented and discussed eight themes and sub-themes that emerged from data including summary and my interpretation. These themes were students' agentic perspectives towards ICT integration, students' fundamental capabilities towards ICT integration, behavioural perceptions of students about using ICT, role of ICT on students' academic performance, challenges experienced by students during ICT integration, benefits of ICT integration experienced by students, perceptions of students about lecturers' capabilities to model ICT usage and facilitate effective integration, and students' views on guidelines for ICT integration. The next chapter will discuss the findings.

CHAPTER 5:

DISCUSSION OF FINDINGS AND RECOMMENDATIONS

5.1 INTRODUCTION

The first four chapters of this exploratory qualitative case study presented the background, rationale, significance of this study, review of literature, methodology and data analysis and findings. This chapter discusses the findings in detail, the implications for practice including policy, recommendations, limitations of the study and future research. The purpose of this case study was to explore, describe and explain the experiences of TVET college students with ICT integration in their inclusive classrooms and use the findings to propose guidelines for TVET college stakeholders. Purposive sampling was used to select TVET students, including those living with disabilities who were in their exit level programmes for NCV and NATED. Interpretivism was the research paradigm underpinning this study and the Social Cognitive Theory was the theoretical framework used to guide the discussion of the findings.

5.2 DISCUSSION OF FINDINGS

The findings indicated that ICT integration in an inclusive classroom is a dynamic process that goes beyond merely procuring ICT tools and placing them in the classroom or just giving them to students. It requires institutions to first understand the students' diverse personal factors including their disabilities and then to procure the devices, create an environment that will accommodate students' needs and provide lecturing staff who are not only competent in using ICT themselves but who are able to strategically integrate it in an inclusive classroom. Through the lens of SCT as a theoretical framework, mentioned in Chapter 2, the discussion of the research findings in this chapter answers the research sub-questions and main question. According to SCT, there is a functional dependency between personal factors (i.e. cognitive, affective and biological events), behavioural patterns and environmental/social events in a triadic reciprocal causation that operate as interacting determinants that influence one another bidirectionally (Bandura, 1999). In elaborating on the findings, SCT guided the discussion on how functional dependency occurs in an inclusive-ICT-integrating environment leading to

experiences of students with ICT integration in the selected TVET institution, as illustrated in Figure 2 below.

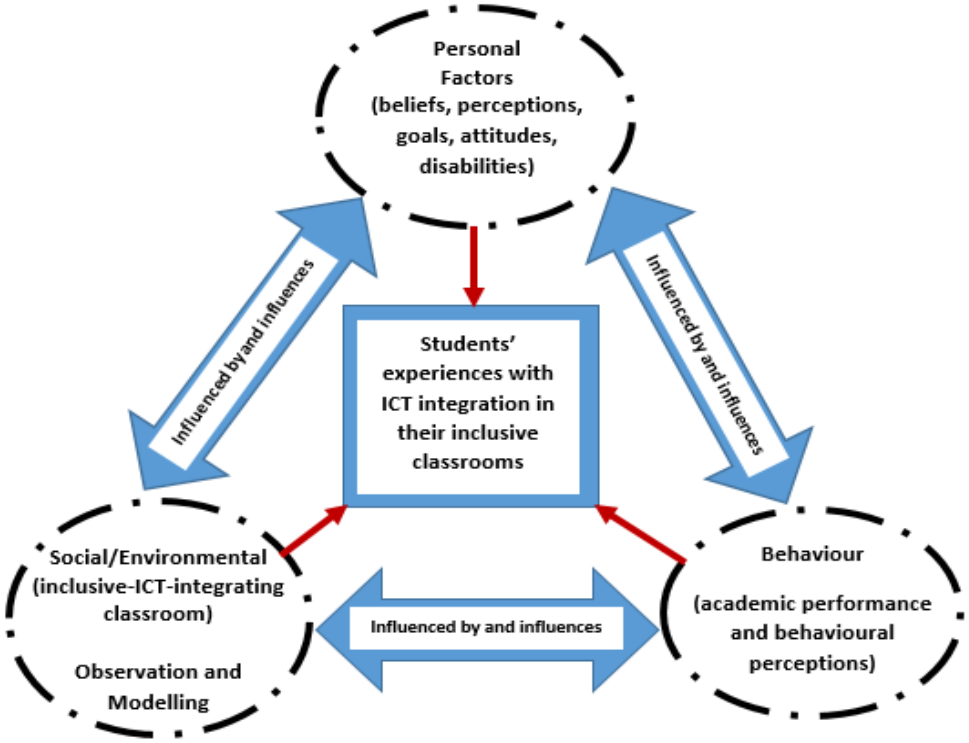

Figure 5.1: SCT bidirectional influences: adapted from Social Cognitive Theory of Mass Communication (Bandura 2001)

These findings presented students' metacognition which is important in effective integration of ICT in an inclusive classroom. According to Tanner (2012), students are capable of monitoring and directing their own learning because metacognition includes orchestrating their learning plans, monitoring their success, correcting their mistakes and reflecting on their performance. In this research, students reflected on their learning experiences in a classroom where ICT is integrated by verbalising their declarative knowledge of ICT integration, their procedural knowledge of how they use ICT tools and strategies and their self-regulatory knowledge of why they use ICT tools and how they independently apply these strategies when using ICT. It is also important to state that the reciprocal causation does not necessarily occur simultaneously and the source of influence is not of equal strength (Bandura, 1989).

5.3 ANSWERING THE RESEARCH QUESTIONS

5.3.1 Research Sub-question 1: Feelings and Attitudes

What are the feelings and attitudes of students towards the integration of ICT in their inclusive classrooms at TVET colleges?

The answer to this question is that students' feelings and attitudes and perceptions towards ICT integration are positive and they feel that integration should take place in all subjects. This question focused on the students' personal factors and the influence they have on ICT integration in their classroom. Two themes and their sub-themes emerged from the data and served to answer this question. The emerged themes entailed students' agentic perspective (cognitive beliefs and affects) and their fundamental capabilities (symbolising, vicarious, forethought, self-regulatory and self-reflective) as established and explained in Chapter 4. This discussion focused on the influence that these personal factors have on the inclusive-ICT-integrating classroom as well as their behaviour according to SCT.

5.3.1.1 Personal factors of students towards ICT integration

Personal factors refer to individuals' attitudes, knowledge, cognitive abilities, physical characteristics, beliefs, goals and perceptions (Gifford & Nilsson, 2014; Subotnik et al., 2019). In this study, these referred to students' cognitive beliefs, affects and fundamental capabilities. The personal factors should not be construed in static terms of differences in individuals but rather as personal determination of action because they operate as multifaceted dynamic factors (Bandura, 1999). The findings indicated that students' psychological inclinations towards ICT integration were very positive. They believed that it was relevant, made learning easier for them, and when ICT was used, they were able to easily understand the subject content; it was better than using textbooks; it increased their self-efficacy and created a sense of inclusion for all learners including those living with disabilities. They felt empowered and confident to look for jobs. However, they felt that the current integration of ICT was insufficient because it was limited and not implemented by all lecturers in all subjects.

5.3.1.2 Influence of students' personal factors on behaviour in an inclusive-ICT-integrating classroom

Because of their positive attitudes, perceptions and feelings towards ICT integration, students practically used ICT for studying even when they were not in the classroom and wanted to use it every day in all subjects. Students living with disabilities used ICT tools including assistive devices. Platforms such as Google were used to research information relevant for assignments which increased knowledge and understanding, reduced time spent on doing assignments and led to meeting deadlines and scoring better marks that resulted in improvement in their academic performance for the subjects where ICT was integrated. Participation, especially for students living with disabilities such as blindness and dyslexia, increased and concentration improved because they were not distracted by taking notes since they were able to record lessons which meant that their attendance also improved for those subjects. They easily understood subject matter presented with ICT tools and preferred ICT compared to textbooks. Those who were allowed to use cell phones in class were able to take pictures of notes from the white board instead of handwriting them in their exercise books. They participated confidently in work-integrated learning or internships since they believed that they were well-equipped to do the tasks.

5.3.1.3 Influence of students' personal factors in an inclusive-ICT-integrating classroom

According to SCT, new behaviour patterns could be acquired by direct experience or by observing others in a social setting. However, the process is influenced by and can influence personal factors (Bandura, 1999). Besides the four critical elements that exist in learning by observation and modelling in a social setting (Bandura, 1989), there are shared beliefs in individuals' collective power to produce results which serve as a key ingredient in collective agency. Results were not only attained by knowledge and skills but by continuous interaction, coordination and synergy in the group (Bandura, 2001). The discussion of findings demonstrated the influence of personal factors in the classroom with the collective agency of individuals. Since the personal factors of students were positive towards ICT integration, they influenced students to spend most of their time in the classrooms where they were able to

access ICT tools such as Wi-Fi and laptops and were taught with tools such as smartboard and projectors. Students watched lecturers and peers using ICT and indicated that they preferred to be assisted by peers. They learned from lecturers and peers who modelled the use of ICT tools. They each had an opportunity to model the use of ICT without even noticing it. They enjoyed receiving instructions and feedback via ICT and interaction among themselves as students improved. Therefore, students paid attention in class and grasped what was being taught. Retention occurred because they believed that they easily understood what they were taught and that they would be able to recall it to get better marks. Furthermore, in the workplace, work would be easier because students would be able to transfer what they had learned inside the classroom into practice and would be able to obtain more information using search engines on the internet.

5.3.2 Research Sub-question 2: ICT Influence of Academic Performance

How does ICT integration influence academic performance of students at TVET college?

In answering this question, the findings showed that students believed that their academic performance was enhanced in the subjects where ICT was integrated as a pedagogical tool. However, students' pass rates for computer subjects such as CP and IP for NATED students indicated that they were struggling at the higher levels like N5 and N6 in these subjects. Two themes (academic performance and behavioural perceptions) assisted in explaining students' behaviors and their influence on ICT integration in their classroom and personal factors. According to Siedlecka et al. (2019), perceptions and actions are closely related. Based on this premise, students' perceptions of ICT integration were related to their behaviour in interacting with ICT tools for learning. In answering this question, the findings demonstrated the behavioural perceptions and academic performance of students in using ICT for learning and its impact on inclusive-ICT-integrating classroom and personal factors.

5.3.2.1 Behaviour of students in an inclusive-ICT-integrating classroom

According to Uher (2016), researchers have diverse ways of thinking about what behaviour is because of the various definitions that exist. In Chapter 4, behaviour

was defined as individual's actions or activities that are consciously and unconsciously displayed and are functionally mediated by stimuli (Kidd-Smithers, 2016; Uher, 2016). These actions or activities include motor responses, verbal responses, skills, practice, interaction with tools and others, achievements and self-regulated learning for students in this study. The findings showed that students used a variety of ICT devices and applications for different purposes. These devices and applications as stimuli functionally mediated students' actions and activities in learning which had led to improved academic performance. These behaviours include sharing documents such as previous questions papers; easy communication with peers and lecturers; researching information for assignments; assisting each other over social network platforms with assignments and revision; updating each other with latest news especially during Covid-19; increased understanding of subject content and improved marks/academic performance; minimal need for scribes for those living with disability; working independently; participation in class; improved knowledge and better study habits.

5.3.2.2 Influence of students' behaviour on their personal factors

The behaviours of students influenced their personal factors by increasing their confidence to work independently and promoting self-regulatory learning. Students' cognitive processes improved because they understood the subject content better. An increase in independent learning increased metacognition in students (Stokes, 2013).

5.3.2.3 Influence of students' behaviour in inclusive-ICT-integrating classroom

Students did not rely on rewards and encouragement for their efforts in using ICT tools and applications, but because they saw the results of using ICT tools, they were able to assist each other to overcome fears created by lack of confidence in a subject by discussion over Computer Supported Collaborative Learning (CSCL) Tools such as social platforms, e.g., group chats where collective agency comes into play. These group chat platforms are mostly created and monitored by lecturers and no student mentioned any bullying. The findings of the study conducted by Calvo et al. (2014) on the effective of CSCL tools, including mobile chats, revealed that WhatsApp was one of the applications best fit for learning purposes. The findings in this study indicated that students discussed subject content in these platforms and

when in class, effective learning experience was created because students were participating, paying attention, recalling what they had discussed in groups, gaining new insight, observing lecturers and peers and modelling the behaviour themselves. This behaviour challenges lecturers to be competent in using ICT tools which could be the reason why some lecturers avoided ICT. This resulted in no uniformity and inconsistency mentioned by students because lecturers only selected the tools that they were comfortable with or knew how to use. The actions of lecturers who avoided ICT discouraged students who were aware of the existence of certain ICT tools but realised that their lecturers were not using them, especially those that were designed for students living with disabilities. Because students were knowledgeable and understood their tools, they were easily able to see whether a lecturer was not fully competent in using the tools for teaching and learning and this could discourage lecturers from integrating ICT in their lectures. Students' behaviour also challenged the institutions to procure tools that were useful for teaching and learning purposes.

5.3.3 Research Sub-question 3: Challenges and Benefits of ICT Integration

What challenges and benefits do students at TVET colleges experience with ICT integration in their inclusive classroom?

In answering this question, the study focused on the social setting and its influence on personal factors and behaviour of students. Many researchers, as stated in literature review, listed challenges (Mukhari, 2016; Ndlovu, 2015; Padayachee, 2017; Vandeyar, 2015); benefits (DoE, 2004; Mukhari, 2016; Ncube, 2018; Ndlovu & Moll, 2016) and the important role played by lecturers in effective integration of ICT (Ali, 2017; Blackburn, 2018; Msila, 2015; Nkula & Krauss, 2014). This study discovered that there were various challenges, disadvantages, benefits and advantages that were experienced by students with ICT integration. The question also looked at the role of lecturers in modelling the behaviour and use of ICT tools for pedagogical purposes by focusing on the perceptions of students about the capabilities of lecturers to model ICT usage, facilitate effective integration and support students; the fear and digital gap they thought existed; and the strategies that lecturers used in integrating ICT to accommodate all students. This question focused on the students' experiences with ICT tools in the classroom where observational learning took place with lecturers and their peers as models.

5.3.3.1 Environmental and social factors in an inclusive-ICT-integrating classroom

The classroom had both positive and negative factors that influenced the personal factors and behaviour of students. The positive factors emerged from the benefits and advantages listed by students and the negative factors from the challenges and disadvantages. In addition, lecturers were expected to model the behaviour and ensured that the four elements (attention, retention, production and motivation and reinforcement) listed in SCT occurred.

The negative factors included students forgetting what they had been taught; resistance to change by students and lecturers; poor network connectivity including Wi-Fi range not reaching other classes; electricity interruptions caused by load shedding; not enough time in a period; viruses; lack of data when they had to do homework; high noise levels in the classroom for students who were using assistive devices such as JAWS and voice recorders; losing work when they forgot to save; and destruction caused by students who were accessing social media to chat with friends during the lesson. The positive factors included using ICT for assignments; easy and quick access to information; interacting with peers and lecturers; opportunity for all students to participate and be on the same level, especially those living with disabilities; less time for note taking but more time for concentration; and gaining skills needed in the job market.

The literature review emphasised the important role that teachers play in teaching and learning and therefore their capability to support students when using ICT tools; skills of integrating ICT or lack thereof; their lack of knowledge of the variety of ICT tools including a lack of understanding of students' devices, especially those used by students living with disabilities; and a lack of strategies to use ICT to accommodate all student were factors in the classroom.

5.3.3.2 Influence of environmental and social factors on students' personal factors

Students lost confidence in their abilities when they forgot what they had been taught and appreciated that lecturers had strategies to help them recall without retelling them. Resistance to change by some students and lecturers as well as a lack of knowledge and skills negatively impacted the integration of ICT which was why many students expressed that they wished that ICT could be used in all classes and all

subjects. Students had negative attitudes towards lecturers who were not using ICT because they felt that they were not accommodating all students including those living with disabilities; however, the use of ICT encouraged them to participate.

5.3.3.3 Influence of environmental and social factors on students' behaviour

Students' learning habits changed because they felt that time was limited in one period and instead of using the brief time to take notes, they used it to pay attention and used their devices to record lessons or take pictures of notes written on the board. The failure of some lecturers to model the use of ICT made students observe their peers and they preferred to be assisted by them when they were struggling with something. Students felt inconvenienced by factors such as load shedding because lecturers cancelled classes for lessons that required electricity when there was no electricity. Quick access to information was a positive influence on their academic performance and since they were able to interact with peers, they were able to do revision together.

5.3.4 Research Sub-question 4: Formulation of Guidelines

How can the students' experiences of ICT integration at TVET colleges be used to form guidelines for TVET college stakeholders?

This question focused on the overall experience of students and how it could be used to formulate guidelines. The answer to this question came from the factors raised in themes and sub-themes about the interventions including tools that were used at the selected college, the limitations that students were experiencing, and the tools that students wished to use; and the impact of those factors on students' self-efficacy which, according to SCT, occupied a pivotal role in the triadic reciprocal casual structure because efficacy beliefs affect adaptation and change through their impact on other determinants (Bandura, 2001). In addition, self-efficacy reflects individuals' confidence in their ability to apply control over their own motivation, behaviour and settings and accounts for a sizeable share of variance in development of cognitive competencies and academic performance (Bandura et al., 1996). It is considered as a powerful predictor of progress and academic success and a key structure for improving learning and academic performance (Balali et al., 2018). In this regard, the assumption is that, if these factors were to change, a fulfilling

environment would be created for students. Through SCT and based on the factors that students wished could be changed, the prediction is that an inclusive-ICT-integrating environment could be created and its influence on students' personal factors and behaviour could be evaluated.

5.3.4.1 Current situation

The findings indicated that students were in an environment where ICT integration was minimal and only used in a few subjects; many lecturers were not integrating it but reading from a textbook in front of students; there were no guidelines and uniformity. Instead, there was inconsistency in integration, insufficient ICT resources such as applications, projectors, smartboards, access to Wi-Fi and other networks, and limited time in a period for a lesson which is not enough for integration. In SCT (Bandura, 1977), there were four sources of information for self-efficacy:

- Performance accomplishments which are based on personal mastery experience. In this study, this means that if students accomplished good academic grades because of ICT tools, they would believe that when they were using ICT, they would accomplish good results again which is evidenced in the findings in this study that students continuously achieved high marks in the subjects where ICT was integrated based on previous performance accomplishments.

- Vicarious experience means that individuals rely on the observation of models. In this study, this meant that if students observed other students obtaining high marks because they were using ICT, they were more likely to believe that if they used ICT, they would also get high marks. This could also be used to predict that if students observed others getting high marks when they were taught by lecturers who integrated ICT, they would believe that if they were taught in classroom where ICT was integrated they also would get high marks. This was evident in students' utterances about private college students doing better than them because they had been brought up using state-of-the-art technology.

- Verbal persuasion is based on individuals' belief that they could cope successfully or they were capable to perform a behaviour because someone, whose opinion they trust, said so. This means that, if students were told by their lecturers and their peers that they could achieve high results when using ICT,

their self-efficacy would increase. In this study, the findings indicated that students trusted the opinions of their peers when it comes to ICT as they would rather be assisted by classmates than by their lecturers.

- Emotional arousal is based on individual's physiological factors depending on the whether they regarded a circumstance as stressful, taxing, depressing, threatening or the opposite. This means that if the students' environment that integrated ICT aroused positive emotions such as joy and the environment that did not integrate ICT was boring, as is the case in this study, they were more likely to have high self-efficacy about their capabilities in subjects where ICT was integrated.

Based on this premise and the findings of this study, students' self-efficacy could be improved. Thus, this research sub-question could be answered as follows:

5.3.4.2 Changes in the environment and social setting – the inclusive-ICT-integrating classroom

Students wished for an environment that is guided by clear policies and guidelines; where ICT integration is compulsory and implemented by all lecturers in all subjects; where students' classroom rules are enforced by all lecturers with consistency and there is clarity on issues such as use of cell phones in the classroom. Using ICT tools in all subjects would improve the strategies for teaching and learning and lecturers would stop reading from textbooks when they teach but would instead prepare lessons thoroughly to integrate ICT without deviating from the curriculum. The institution could increase the availability of resources such as laptops, smartboards and projectors so that ICT is available for all subjects and used by all lecturers including those who are teaching theory subjects like Office Practice. If all lecturers were mandated to integrate ICT, those requiring training would need to be trained and they could then model the use of ICT and effectively integrate it in their inclusive classrooms. Students would also have access to a variety of ICT tools.

5.3.4.3 Influence on personal factors of students

Students' skills would improve leading to enhanced confidence and self-efficacy especially when they looked for jobs because they regarded ICT knowledge as a tool that equipped them for the working environment. Positive attitudes would increase

since they believed that using ICT for teaching and learning would help them to easily understand the subject content. Those living with disability would feel included and on par with other students.

5.3.4.4 Influence on behaviour of students

Students would submit typed assignments for all subjects except handmade projects and their assignments would be of high quality because of the ability to access the vast amounts of information available to them through the use of ICT. Students' attendance, participation in class and study habits would improve because ICT would be integrated in all subjects, leading to enhanced academic performance, increased overall results and improvement in self-regulated learning.

5.4 SUMMARY

The main question for this research study is: What are the experiences and perceptions of TVET students with ICT integration in their inclusive classrooms in Johannesburg? The answer to this question, based on the interpreted findings, is that students' experiences and perceptions were the result of bidirectional influence of their personal, behavioural and environmental factors. Their personal factors were positive and they viewed ICT integration as relevant in order to achieve their goals. Their behaviour also indicated that ICT integration produced the results they needed in the subjects where ICT was integrated but in computer-related subjects for NATED students, it seemed the higher the level the more challenging it was for students to obtain the required results. However, the environmental factors indicated that more work needs to be done to create an environment with well-trained lecturers who could integrate ICT successfully.

5.5 CONTRIBUTION OF THIS STUDY

This study explored and explained the experiences of TVET students in an inclusive–ICT-integrating classroom through the lens of Social Cognitive Theory. The TA used to analyse data made it possible to explain the experiences of students, form a meaningful interpretation from findings and give students a platform to express their perspectives. Therefore, it contributes knowledge in the field of education in general, inclusive education, psychology of education and ICT integration in the classroom by adding to literature, policy and practice.

It was stated in Chapter 1 and Chapter 2 of this study that there was dearth of literature on TVET students' experiences with ICT integration in their inclusive classroom. This study thus contributes to the literature.

It was also stated that institutions did not have guidelines of what ICT tools to purchase or use in the classroom with the decision depending on the budget of each institution (DoE, 2004; Padayachee, 2017). Furthermore, they did not have the policies that stipulated the strategies or methods to guide lecturers to integrate ICT in their classrooms; indeed, lecturers could decide whether to integrate or not (Mukhari, 2016; Ndlovu, 2015). Using the experiences of students, including those living with disabilities as stated in this study, the institutions should be able to come up with their own internal policies and guidelines that would take into consideration the metacognition of the students, identify ICT tools that were needed for effective integration and develop pedagogical strategies.

Guided by SCT, the college stakeholders should be able to monitor and evaluate the influences of students' personal factors and behaviour in the integration of ICT in the classroom and could monitor and evaluate the influence that the classroom environment and its social setting have on the personal factors and behaviour of students. Then strategies and methods would be modified when necessary.

5.6 IMPLICATIONS FOR PRACTICE

Even though the findings of this study were specific to the experiences of TVET students in an inclusive-ICT-integrating classroom in Johannesburg who were at the exit levels in NATED and NCV; it is likely that implications would mean different things to educational stakeholders in general. These are students in other HE settings including other TVET colleges, lecturers, college management teams, DHET officials, policymakers, curriculum developers and educational psychologists. This view should be used as a way to start a dialogue regarding ICT integration in an inclusive classroom.

5.6.1 Students in General

The findings indicated that all students considered ICT integration relevant as it makes subject content easy to understand and enhances their academic performance. However, only few lecturers were integrating it in their subjects. The

implication of the current situation is that even though the institution made interventions in terms of ICT resources, the pass rate was declining. It was stated in Chapter 1 that regardless of reasons why students enrolled at TVET colleges, they were expected to achieve the academic standards that would lead to certification and then make them employable. The findings of this study indicate that students believe that ICT integration is a system that, when used effectively, could lead to them achieving their goals of graduating and getting jobs which was why they wanted ICT to be integrated in all their subjects. The institutions would have to open dialogue with students to understand which ICT tools, beyond those that were mentioned in this study, were needed. Institutions need to create or modify policies and guidelines on how this can be achieved; assist lecturers who are not competent, resistant to change, scared of ICT or prefer reading from a textbook instead of using ICT; provide training for those who require training; purchase adequate resources to facilitate integration and monitor regularly that these tools are effectively integrated which would lead to enhanced academic performance in a number of subjects and improve the overall pass rate.

5.6.2 Students Living with Disabilities

The findings indicated that students living with disabilities were receiving support they needed from some lecturers who understood their disabilities and their assistive devices. Other lecturers did not integrate ICT in their teaching and students felt excluded and were not able to participate to their fullest potential. They also felt that there was a gap between lecturers and DU team. The implication of this was that some students would rather ask for help from their peers instead of asking lecturers and would rather study on their own because they felt that they were not accommodated, had low self-esteem and participated less in class. To improve on this, students could disclose their disabilities during the application and registration phase to ensure that by the time classes commenced, all necessary assistive devices according to different disabilities had been procured. To maximise support, lecturers would need to be oriented by the DU team on types of new disabilities that they would have to accommodate in their classes and how to support those students including understanding the devices that those students would use.

5.6.3 Policy

The findings indicated that students experienced inconsistency and a lack of uniformity in integrating ICT and using ICT tools in the classroom. Some lecturers integrated ICT and other did not; for example, some lecturers allowed students to use cellphones in their classrooms and some did not. The implication of this was that some students observed the use of cell phones in the classroom as a distraction to the lesson with students busy on social networks. Others observed the use of cell phones as productive with students taking notes of what was on the board to use for studying later or recording lessons for revision later or for research or for interacting with other students for learning purposes. In addition, students assumed that lecturers who did not integrate ICT were resistant to change, scared to use it, incompetent in integrating or using it, and usually called a technician when students were experiencing challenges in their interaction with ICT tools. To improve on this, the institution could devise rules and regulations on which devices students are allowed to use in the classroom and for what purpose; formulate guidelines for lecturers on how to integrate ICT and enforce the rule; and monitor that students and lecturers adhere to the set standards.

5.6.4 Academic Performance

The findings indicated that student were not performing well in CP N6 and IP N6. The NATED students who participated in the study could not explain the reason for this because, at the time of conducting the study, they were still doing their N6. The pass rates affected the overall performance of the college and delayed students from completing on time and graduating. This can be improved by using open dialogue with students who failed these subjects and those who passed. Then, Social Cognitive Theory could be employed to establish the personal, behavioural and environmental factors for the two groups to determine an effective way to integrate ICT and change their academic performance in subjects where students were not performing well.

5.7 LIMITATIONS

Like most research studies, this study has limitations. It is important for researchers not only to present limitations but to explain the implications as well as steps taken to mitigate those limitations (Ross & Bibler Zaid, 2019).

The research was conducted in one public TVET college in Gauteng out of eight in the province and a total of 50 in SA. Even though the participants represented NCV and NATED students, including those living with disabilities, the sample was small with only 16 participants and a limited number of disabilities. The participants were TVET students at their exit level, who had used ICT tools for at least a year during their studies. Measures were taken for validity including triangulation but trying to generalise the findings will be problematic.

The qualitative findings in this study were interpreted by me, as the researcher, and interpretation was within a limited scope of education and psychology using Social Cognitive Theory. Moreover, I focused on the factors that impacted learning in the classroom with the integration of ICT and did not consider other factors such as physical aspects of the classroom or the cultural and socio-economic environments of the students.

In mitigating the limitations, I employed strategies described by Smith (2018) that can lead to naturalistic, transferability and analytical generalisation by providing a detailed description of the entire process and context including evidence such as the verbatim quotations from participants to help readers to reflect upon these and make connections in their own settings. In addition, I used a combination of CAQDAS for data analysis (Miles et al., 2014) and theory to interpret and explain the results without limiting the explanations to the population or the setting. I explained how the findings might relate to the broader community to invite those who would read the report to evaluate whether the situations described overlap with their own (Smith, 2018).

5.8 RECOMMENDATIONS TO STAKEHOLDERS

The findings indicated that students enjoyed using ICT and spent most of their time on their digital tools. It was also established that a classroom is a social context with group dynamics involving students and lecturers with their different personal and

behaviour factors. It is therefore recommended that a dyad be formed, a dialogue be initiated, and skills and resources be upgraded to facilitate change and promote inclusion and effective ICT integration.

5.8.1. Dyad

A dyad is described as an important aspect of individual's development and is formed when two persons interact by paying attention to or participating in one another's activities (Bronfenbrenner, 1979). Dyadic relationships between students and lecturers should be established leading to lecturers paying attention to and participating in students' activities, taking into consideration their personal factors and behavioural perceptions of using ICT tools. In addition, lecturers will use a student-centred learning approach that will integrate ICT in all subjects to enhance teaching and learning. Students will pay attention in the classroom and participate in activities facilitated by lecturers. When dyadic relationships are formed, students will be open about their challenges, especial those living with disabilities for lecturers and DU to identify whether an Individualised Education Plan (IEP)is required for that student or not.

5.8.2. Dialogue

A dialogue between the college stakeholders is imperative to discuss which ICT tools are required, which assistive devices are needed to support students living with disabilities and which training programmes are needed by lecturers to be able to confidently integrate ICT. Dialogue should also include challenges, limitations and wishes raised by students in this study, as well as strategies to modify policies including the types of ICT tools that students can access when they are in the classroom. Dialogue should also motivate change in attitudes, behaviours for students and lecturers and encourage modification of teaching strategies by lecturers in order to accommodate diverse needs of students, and maximise their participation.

5.8.3. Upgrade of lecturers' skills

Training lecturers will serve to "support the further development of teacher educators at tertiary institutions to integrate digital technologies in their own teaching" as stipulated in Professional Development Framework for Digital Learning (DBE, 2018,

p.31). Students in this study stated that many lecturers were not using ICT tools for teaching and learning and, even though they were not sure of the reasons, they suggested that lecturers needed training on how to integrate ICT for pedagogical purpose. Naiker and Makgato (2018) stated in a study conducted on ICT integration in TVET classroom that lecturers acknowledged that students had advanced skills and knowledge of ICT. In addition to training lecturers in using ICT tools, a training on assistive devices is also imperative in order for them to know which tools to use in accommodating student living with disabilities.

5.8.4. Upgrade of resources

The findings of this study indicate that some classrooms did not have even one ICT tool. According to Professional Development Framework for Digital Learning, lecturers should not be discouraged by limited resources because access to digital tools and resources does not result to improved classroom experience for learning. In addition, it also states that one device with strong pedagogical practice can be more effective than many devices with poor strategies (DBE, 2018). It is recommended that at least all classrooms should have at least one ICT device, therefore, procuring of resources is imperative.

5.9 RECOMMENDATIONS FOR FUTURE RESEARCH

As stated under the limitations, this research study focused on one TVET college in Johannesburg out of the 50 TVET colleges in SA. It focused on the NATED and NCV students in the final stages of their programmes. All students are registered in different courses at a business campus that offers NATED courses in Business Management, Management Assistance, Financial Management, Hospitality and Educare; and NCV courses in Management, Hospitality, Primary Health and Education and Development. Similar research or a comparative study could be conducted involving a wider group of students, bigger population, different levels of study, in different provinces, in different programmes and courses to further explore the experiences of students.

This research also focused on students in a campus that has a DU to support students living with disabilities. A different study can be conducted at a TVET college

that does not have such a unit to compare the impact that a DU may have in an inclusive classroom.

The qualitative method was used to collect data with a limited number of 16 participants. A quantitative study could be conducted to include a larger number of participants especially on the variety of ICT tools that can be integrated effectively in their classrooms to determine what ICT tools work well and increase the range of tools that institutions can consider procuring.

5.10 CHAPTER SUMMARY

This chapter discussed the findings and answered each research question using SCT as theoretical framework. It further provided the explanation how the findings of the study can contribute to different aspects of education. Implication to practice were discussed towards students in general, students living with disabilities, policy, and academic performance. Limitation were also explained. It presented recommendations to stakeholders such as formation of dyadic relationships, dialogue, upskilling of lecturers and increasing the resources. It also made recommendations for future research.

5.11 CONCLUSION OF THE STUDY

Different chapters presented the information that has assisted in answering the research question and fulling the purpose of the study. This has been achieved because the perspectives of students on the topic indicated what worked for them and what did not work. These perspectives when taken into consideration by all stakeholders at TVET colleges can transform education settings, create a student-centred approach and effective inclusive classrooms that can provide students with a fulfilling learning experience. Conducting this research during the Covid-19 lockdown became an eye-opener to the reality that SA is in need of studies like this one. Teaching and learning came to a halt because of the pandemic; however, behavioural perceptions of the students, according to the findings of this study, indicated that they are well advanced and practically using ICT on their everyday lives for activities such as learning, interacting, playing games, and working for those who are doing work-based learning. The findings also revealed that students spend more time on their digital tools than lecturers do. TVET institutions could use these

findings and recommendations to modify pedagogical strategies and close gaps to give students the skills needed to graduate and be employed. This study gave students a voice to share their current experiences and the changes they wished to see in their learning process. Even though the study focused on students at the exit level in NCV and NATED, their experiences can be used when modifying policies, formulating guidelines and pedagogical strategies and in practice during teaching and learning. The role of ICT in the education context has been shown to be imperative.

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APPENDIX A: ETHICS APPROVAL

UNISA university of south africa

UNISA COLLEGE OF EDUCATION ETHICS REVIEW COMMITTEE

Date: 2020/06/10

Ref: **2020/06/10/45024405/33/AM**
Name: Mrs TG Ndlovu
Student No.: 45024405

Dear Mrs TG Ndlovu

Decision: Ethics Approval from 2020/06/10 to 2023/06/10

Researcher(s): Name: Mrs TG Ndlovu
E-mail address: 45024405@mylife.unisa.ac.za
Telephone: 083-964-0715

Supervisor(s): Name: Dr M. F. Mavuso
E-mail address: mavusmf@unisa.ac.za
Telephone: (012) 429-8635

Title of research:

Technical and Vocational Education and Training Students' Experiences with Information and Communication Technologies Integration in their inclusive Classrooms.

Qualification: MEd Psychology of Education

Thank you for the application for research ethics clearance by the UNISA College of Education Ethics Review Committee for the above mentioned research. Ethics approval is granted for the period 2020/06/10 to 2023/06/10.

*The **low risk** application was reviewed by the Ethics Review Committee on 2020/06/10 in compliance with the UNISA Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.*

The proposed research may now commence with the provisions that:

1. The researcher will ensure that the research project adheres to the relevant guidelines set out in the Unisa Covid-19 position statement on research ethics attached.
2. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.

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3. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the UNISA College of Education Ethics Review Committee.
4. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
5. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing.
6. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
7. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data requires additional ethics clearance.
8. No field work activities may continue after the expiry date **2023/06/10**. Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

Note:

The reference number **2020/06/10/45024405/33/AM** *should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.*

Kind regards,

Prof AT Motlhabane
CHAIRPERSON: CEDU RERC
motlhat@unisa.ac.za

Prof PM Sebate
ACTING EXECUTIVE DEAN
Sebatpm@unisa.ac.za

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

APPENDIX B: RESPONSE FROM DHET ON REQUEST TO CONDUCT RESEARCH

Gmail — Gugu Ndlovu <gugundlovu.twin@gmail.com>

RE: Request for Permission to conduct research at TVET college

Rakal Govender<Govender.R@dhet.gov.za> Fri, Jul 17, 2020 at 11:38 AM
To: Gugu Ndlovu <gugundlovu.twin@gmail.com>
Cc: Renay Pillay <Pillay.r@dhet.gov.za>

Dear Gugu,

Thank you for advising. DHET only needs to be approached when more than 10 colleges. Since one college, only, kindly approach the college, directly, for permission.

Kind regard,

Rakal

From: Gugu Ndlovu [mailto:gugundlovu.twin@gmail.com]
Sent: Friday, July 17, 2020 11:36 AM
To: Rakal Govender
Cc: Renay Pillay
Subject: Re: Request for Permission to conduct research at TVET college

Dear Rakal,

Thank you for your response.

Only one TVET will be involved in the research. It is [redacted] TVET College in Johannesburg.

Thank you again for your assistance.

Yours Faithfully,

Gugu Ndlovu

On Fri, 17 Jul 2020 11:31 Rakal Govender, <Govender.R@dhet.gov.za> wrote:

> Dear Gugu,
>
> Thank you for the email, below. Kindly advise on how many TVET Colleges would be involved and the names of the colleges?
>
> Kind regards
>
> *Rakal Govender*
>
> ***Deputy Director:*** *Research Coordination*
>
> ***Directorate:*** *Policy, Research and Evaluation*
>
> ***Room:*** *604*
>
> ***Address:*** *123 Francis Baard Street, Pretoria*
>
> ***Tel:*** *012 312 5657*

APPENDIX C: LETTER TO COLLEGE PRINCIPAL

UNISA college of education

REQUEST FOR PERMISSION FROM COLLEGE PRINCIPAL TO CONDUCT RESEARCH

Dear Sir,

I, Thembelihle Gugulabasha Ndlovu, am doing research under supervision of Dr M. F. Mavuso, a Senior Lecturer in the Department of Psychology of Education, towards a Master of Education at the University of South Africa. Dr Mavuso can be contacted at mavusmf@unisa.ac.za/012 429-8635. We request for permission to conduct research at your college [redacted] TVET College). The title of the study is: Technical and Vocational Education and Training Students' Experiences with Information and Communication Technologies Integration in their Inclusive Classrooms

The aim of the study is to explore, describe and explain the experiences of TVET college students with ICT integration in their inclusive classrooms. Your college has been selected because of its unique concept of ICT integration and Disability Unit.

The study will entail interviews and focus group videoconferencing via Synchronous Computer-Mediated Communication with students (diagnosed with disabilities and those not diagnosed) who are using ICT (like computers, smart phones, smart board, assistive devices, etc) in their learning in inclusive classrooms.

Ethical clearance has been granted by the College of Education Ethics Committee at the University of South Africa; permission to conduct research at the college is requested from DHET and principal; consent will be requested from students. Participation in this study is voluntary and participants may withdraw at any time without any negative consequences. The identities of participants will not be recorded anywhere and the answers they will give during interviews and focus group will be treated confidential using code numbers or pseudonyms.

The benefits of this study are: The findings of the research will be shared with other TVET colleges to assist lecturers in classroom practice, DHET and all role players in the education sector with the hope that it will provide information and strategies that will assist to identify the gaps and provide solutions on how to close those gaps regarding the integration of ICT in TVET colleges' inclusive classrooms for both NCV and Report 191 programmes.

There are no potential risks anticipated. There will be no reimbursement or any incentives for participation in the research.

Upon completion of the study, I will give feedback to all participants, provide a report to you as the principal at the college and Department of Higher Education and Training. The findings will be published as a dissertation and may appear as research articles or chapter of books.

Thembelihle Gugulabasha Ndlovu
(gugundlovu.twin@gmail.com)

APPENDIX D: LETTER GRANTING PERMISSION FROM COLLEGE PRINCIPAL

DHET 004: APPENDIX 1: APPLICATION FORM FOR STUDENTS TO CONDUCT RESEARCH IN PUBLIC COLLEGES

FOR OFFICIAL USE

DECISION BY HEAD OF COLLEGE

Please tick relevant decision and provide conditions/reasons where applicable		
Decision		***Please tick relevant option below***
1	Application approved	
2	Application approved subject to certain conditions. ***Specify conditions below***	✓
	That the conduct of research must disturb teaching and learning delivery.	
3	Application not approved. ***Provide reasons for non-approval below***	
NAME OF COLLEGE	[redacted] TVET College	
NAME AND SURNAME OF HEAD OF COLLEGE	[redacted] Joseph	
SIGNATURE		
DATE	27/07/20	

[redacted] HEAD OFFICE 27 -07- 2020

APPENDIX E: LETTER TO PARTICIPANTS

UNISA college of education

REQUEST FOR PERMISSION TO PARTICIPANTS TO PARTICIPATE IN A RESEARCH STUDY (WITH CONSENT FORMS FOR INTERVIEW AND FOCUS GROUP)

DEAR PROSPECTIVE PARTICIPANT (STUDENT)

My name is Thembelihle Gugulabasha Ndlovu and I am doing research under the supervision of Dr. M. F. Mavuso, a Senior Lecturer in the Department of Psychology of Education towards a Master of Education at the University of South Africa. We are inviting you to participate in a study entitled Technical and Vocational Education and Training Students' Experiences with Information and Communication Technologies integration in their inclusive classrooms.

WHAT IS THE PURPOSE OF THE STUDY?

This study aims to explore, describe and explain the experiences of TVET college students with ICT integration in their inclusive classrooms and the findings will be used to propose guidelines for TVET college stakeholders.

WHY AM I BEING INVITED TO PARTICIPATE?

You are invited because your experience (feelings, attitudes and perceptions) are the core of this study. The findings will assist to propose guidelines that TVET stakeholders, including DHET, can use to integrate ICT in the inclusive classrooms.

The total number of participants in this study is 16.

WHAT IS THE NATURE OF MY PARTICIPATION IN THIS STUDY?

The study involves semi-structured interviews and focus group sessions through online Synchronous Computer-Mediated Communication (video conferencing) with the researcher taking notes and also recording of session if you are comfortable with it. The study also involves document analysis and you will also be requested to share academic reports and attendance reports; however, all the information you share will be kept strictly confidential. The follow-up interviews, if there is a need, will be telephonically. The duration of the interview is scheduled to be approximately 45 minutes.

CAN I WITHDRAW FROM THIS STUDY EVEN AFTER HAVING AGREED TO PARTICIPATE?

Participation in this study is voluntary and you are under no obligation to consent to participate. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a written consent form. You are free to withdraw at any time and without giving a reason.

WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THIS STUDY?

The benefits for participating in this study are not personally directed to you but the findings will assist other institutions when integrating ICT in their inclusive classrooms and will also assist in proposing guidelines.

ARE THERE ANY NEGATIVE CONSEQUENCES FOR ME IF I PARTICIPATE IN THE RESEARCH PROJECT?

There are no negative consequences of harm foreseeable, however, the time of interviews might be

of inconvenience to you. Kindly indicate if time scheduled is inconveniencing for you, so that the researcher can look at the possibility of rescheduling.

WILL THE INFORMATION THAT I CONVEY TO THE RESEARCHER AND MY IDENTITY BE KEPT CONFIDENTIAL?

Your name will not be recorded anywhere and no one will be able to connect you to the answers you give. Your answers will be given a code number or a pseudonym and you will be referred to in this way in the data, any publications, or other research reporting methods such as conference proceedings. When participating in the focus group, be kindly informed that the nature of focus groups means that anonymity is not guaranteed but all participants will be requested to retain confidentiality and not divulge the identity of other participants.

The data may be used for other purposes, such as research report, journal articles and/or conference proceedings but you will not be identifiable in these reports.

HOW WILL THE RESEARCHER(S) PROTECT THE SECURITY OF DATA?

Hard copies of your answers will be stored by the researcher for a period of five years in a locked cupboard/filing cabinet in her home for future research or academic purposes; electronic information will be stored on a password protected computer. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. After five years, all hard copies will be shredded and electronic data will be deleted permanently.

WILL I RECEIVE PAYMENT OR ANY INCENTIVES FOR PARTICIPATING IN THIS STUDY?

No incentives will be given to any participant for their participation in this study. Participations is voluntary.

HAS THE STUDY RECEIVED ETHICS APPROVAL?

This study has received written approval from the Research Ethics Review Committee of the College of Education, Unisa. A copy of the approval letter can be obtained from the researcher if you so wish.

HOW WILL I BE INFORMED OF THE FINDINGS/RESULTS OF THE RESEARCH?

If you would like to be informed of the final research findings, please contact Thembelihle Ndlovu on 083-964-0715 or email gugundlovu.twin@gmail.com. The findings are accessible after the report has been submitted for academic purpose to UNISA.

Should you require any further information or want to contact the researcher about any aspect of this study, please contact the researcher on the above contact details.

Should you have concerns about the way in which the research has been conducted, you may contact Dr. MF Mavuso using her email mavusmf@unisa.ac.za or telephone number (012) 429-8635.

Thank you for taking time to read this information sheet and for participating in this study.

Thembelihle Gugulabasha Ndlovu

APPENDIX F: CONSENT FORMS

CONSENT TO PARTICIPATE IN THIS STUDY (Return slip)

I, _____ (participant name), confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

I have read (or had explained to me) and understood the study as explained in the information sheet.

I have had sufficient opportunity to ask questions and am prepared to participate in the study.

I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable).

I am aware that the findings of this study will be processed into a research report, journal publications and/or conference proceedings, but that my participation will be kept confidential unless otherwise specified.

I agree to the audio recording of the face-to-face semi-structured interviews and telephonically follow-up interviews.

I understand that the interviews will be conducted via Synchronous Computer-Mediated Communication and I agree to this technique.

I also understand that document analysis are part of the study and I agree to share documents like academic reports and attendance reports.

I have received a signed copy of the informed consent agreement.

Participant Name & Surname (please print) _____

_____ _____

Participant Signature Date

Researcher's Name & Surname (please print) Thembelihle Gugulabasha Ndlovu

_____ _____

Researcher's signature Date

FOCUS GROUP CONSENT AND CONFIDENTIALITY AGREEMENT

I_____ grant consent that the information I share during the focus group may be used by Thembelihle Gugulabasha Ndlovu for research purposes. I am aware that the group discussions will be digitally recorded and grant consent for these recordings, provided that my privacy will be protected. I undertake not to divulge any information that is shared in the group discussions to any person outside the group in order to maintain confidentiality.

I understand that the focus group discussion will be facilitated via Synchronous Computer-Mediated Communication and I agree to this technique.

Participant's Name (Please print): _____

Participant Signature: _____

Researcher's Name: (Please print): Thembelihle Gugulabasha Ndlovu

Researcher's Signature: _____

Date: _____

APPENDIX G: INTERVIEW PROTOCOL AND QUESTIONS

Basic Information

Codes/Pseudonyms will be used.

Participant		Interviewer	T. G. Ndlovu
Method	Synchronous Computer-Mediated Communication (video conferencing)		
Date:	Time:	Duration: 45minutes	

Checklist before the interview:

- Is the consent form completed and signed by participant?
- Which application is preferred by participant e.g., Zoom, WhatsApp Videoconference, Skype?
- Is the application preferred working properly and both interviewer and participant can see each other?
- Notebook
- Pens
- Is audio recorder working fine?

Introduction (Researcher)

My name is Thembelihle Gugu Ndlovu and thank you for signing the consent form.

This is a Masters research which aims to explore, describe and explain students' experiences with Information and Communication Technologies (ICT) integration in an inclusive classroom at a Technical and Vocational Education and Training (TVET) College in Johannesburg, South Africa (SA).

Please feel free and be open to answer all the questions to your best knowledge. If you need me to clarify any question, do not hesitate to say so. As indicated on the request for your consent, all ethics regulations will be adhered to; and be assured that your details will be kept confidential and will not be divulged to any third party. You can also withdraw from this interview session any time. I will jot down notes as we interact and this interview will be recorded so that it can be easy to transcribe later. Please indicate if you are comfortable with this.

Content Questions

This is a semi-structured interview, which means that I will ask you to elaborate. To start this interview, I would like you to firstly complete this short questionnaire to give the information about the technologies you are familiar with.

Short Questionnaire

Which of the following technology do you use in the classroom?

TECHNOLOGY	ALWAYS USE THIS	SOMETIMES USES THIS	NEVER USED THIS
Computer/Laptop			
Voice Recorders			
Tablet			
Cellphone/Smart phone			
Virtual Reality			
Other: (give the technology)			

Which of the following technology and artificial intelligence are your lecturers using in classroom to enhance teaching and learning?

TECHNOLOGY	ALWAYS USES THIS	SOMETIMES USES THIS	NEVER USED THIS
Computer/Laptop			
DVP			
Smart Board			
Tablet			
Smart phone			
Virtual Reality			
Special Scanners			
Smart Television			
Microsoft Office			
JAWS			

List, at least top five, technology devices/application you are comfortable with in class? Why?

_____
_____

Which technology do you wish to use in class that you are not currently using and why?

_____
_____

Research Question 1:

What are the feelings, attitudes and perceptions of students toward the integration of ICT in their inclusive classrooms at TVET colleges?

Interview Questions

Based on the short questionnaire you have completed.

1. How do you feel about using technology in the classroom?

Researcher Notes: _____
_____

2. Do you think ICT integration has changed your learning strategies? Why?

Researcher Notes: _____
_____

3. What is your opinion about ICT integration in inclusive classroom?

Researcher Notes: _____
_____

4. Do you think ICT is imperative in learning? Why?

Researcher Notes: _____

_____

5. Do you think all lecturers must use ICT in their classroom? Why?

Researcher Notes: _____
_____

Research Question 2:

How does ICT integration influence academic performance of students at TVET colleges?

Interview Questions:

1. Has there been any difference in your academic performance since you started using ICT in your studies?
   _____
   _____
2. Do you think that ICT integration is implemented in a way that benefits students? Why?
   _____
   _____
3. How does technology make everything faster, closer and easier?
   _____
   _____
4. What do you think is the role of technology in a students' schooling life?
   _____
   _____

Research Question 3:

What challenges and benefits do students at TVET colleges experience with ICT integration in their inclusive classrooms?

Interview Questions:

1. What challenges do you encounter when using ICT in your classroom?
   _____
   _____
   _____
2. What are the advantages and disadvantages of ICT integration in your classroom?
   _____
   _____
   _____
3. How is ICT integration beneficiary for you as a student now and in the future?
   _____
   _____
   _____
4. What kind of support do you get from your lecturers in case your technology (e.g., computer) is not working?
   _____
   _____
   _____
5. Do you think there are students and lecturers who experience fear of the unknown when it comes to technology? What do you think can be the solution/s to this fear?

_____
_____
_____

6. What digital divide exists between students and lecturers; and how can this gap be closed?

_____
_____
_____

Research Question 4:

How can the students' experiences of ICT integration at TVET college be used to form guidelines for TVET college stakeholders?

Interview Questions:

1. What changes do you think should be made, if any, on how ICT is integrated in your classrooms?

_____
_____
_____

2. Are you allowed to access internet or use Wi-Fi in your classroom? If yes, how often. If no, why not?

_____
_____
_____

3. What limitations are there on what technology to use in class and when to use it?

_____
_____
_____

Conclusion

This brings us to the end of our session and thank you so much for availing yourself and for sharing your experience with me. If you have any question that you would like to ask, you are welcome to ask. If there is any follow-up necessary, I will contact you.

APPENDIX H: FOCUS GROUP PROTOCOL AND QUESTIONS

Basic Information

Codes/Pseudonyms will be used.

Participant 1		Participant 5	
Participant 2		Participant 6	
Participant 3		Participant 7	
Participant 4		Participant 8	
Researcher/Facilitator/Moderator	Thembelihle Gugulabasha Ndlovu		
Method	Synchronous Computer-Mediated Communication (MS Teams video conferencing)		
Date:	Time:	Duration: 1 h30minutes – 2hours	

Checklist before the interview:

- Are all consent forms completed and signed by participants?
- Which application is preferred by participants e.g., Zoom, WhatsApp Videoconference, Skype?
- Is the application preferred working properly and all participants can be seen by researcher?
- Notebook
- Pens
- Is audio recorder working fine?

Introduction (Researcher)

My name is Thembelihle Gugu Ndlovu and thank you for signing the consent form.

This is a Masters research which aims to explore, describe and explain students' experiences with Information and Communication Technologies (ICT) integration in an inclusive classroom at a Technical and Vocational Education and Training (TVET) College in Johannesburg, South Africa (SA).

Please feel free and be open to discuss all the questions to your best knowledge. If you need me to clarify any question, do not hesitate to say so. As indicated on the request for your consent, all ethics regulations will be adhered to; and be assured that your details will be kept confidential and will not be divulged to any third party. You can also withdraw from this focus group session any time. I will jot down notes as we interact and this discussion will be recorded so that it can be easy to transcribe later. Please indicate if you are comfortable with this.

Content Questions

This is a focus group discussion, which means you will be discussing and sharing your views; and there are questions to guide the discussion to ensure that it focuses on the topic. To start this discussion, I would like you to firstly complete this short questionnaire to give the information about the technologies you are familiar with.

Short Questionnaire

Which of the following technology do you use in the classroom?

TECHNOLOGY	ALWAYS USE THIS	SOMETIMES USES THIS	NEVER USED THIS
Computer/Laptop			
Voice Recorders			
Tablet			

Cellphone/Smart phone			
Virtual Reality			
Other: (give the technology)			

Which of the following technology and artificial intelligence are your lecturers using in classroom to enhance teaching and learning?

TECHNOLOGY	ALWAYS USES THIS	SOMETIMES USES THIS	NEVER USED THIS
Computer/Laptop			
DVP			
Smart Board			
Tablet			
Smart phone			
Virtual Reality			
Special Scanners			
Smart Television			
Microsoft Office			
JAWS			

List, at least top five, technology devices/application you are comfortable with in class?

_____
_____
_____
_____

Which technology do you wish to use in class that you are not currently using?

_____
_____
_____
_____
_____

Questions for Focus Group

1. How often do you use technology?

   Researcher/Facilitator Notes:
   _____
   _____
   _____

2. For what purpose do you use technology?

   Researcher/Facilitator Notes:
   _____

_____
_____

3. What influence does ICT integration have on your personal life?

   Researcher/Facilitator Notes:
   _____
   _____
   _____

4. How is your participation in a ICT-enabled classroom compared to a classroom with no technology? Why?

   Researcher/Facilitator Notes:
   _____
   _____
   _____

5. In your opinion, are students' needs accommodated in an ICT-enabled inclusive classroom?

   Researcher/Facilitator Notes:
   _____
   _____
   _____

6. What kind of teaching styles, strategies and techniques are your lecturers using to accommodate the needs of students, including those with disabilities?

   Researcher/Facilitator Notes:
   _____
   _____
   _____

7. What improvement do you think the institutions and DHET can make to ensure that all students are accommodated in ICT integrated teaching and learning environment?

   Researcher/Facilitator Notes:
   _____
   _____
   _____

8. What interventions have your institution put in place to assist all students?

   Researcher/Facilitator Notes:
   _____
   _____
   _____

9. What type of support do you receive from your peers and lecturers while in the ICT enabled inclusive classroom?

Researcher/Facilitator Notes:

_____
_____
_____

10. According to Social Cognitive Theory, personal factors of students like attitudes, self-esteem, etc, influences and is influenced by ICT-enable classroom and the behavior of students. How has ICT enabled classroom influenced you and your behaviour?

    Researcher/Facilitator Notes:

    _____
    _____
    _____

Conclusion

This brings us to the end of our session and thank you so much for your time, insight and for sharing your experience with me. If you have any question that you would like to ask, you are welcome to ask. If there is any follow-up necessary, I will contact you.

APPENDIX I: SAMPLE TRANSCRIPT 1

Transcript: N6S1-IIIP

Short Questionnaire

Which of the following technology do you use in the classroom?

TECHNOLOGY	ALWAYS USE THIS	SOMETIMES USES THIS	NEVER USED THIS
Computer/Laptop	✓		
Voice Recorders			✓
Tablet			✓
Cellphone/Smart phone			✓
Virtual Reality			✓
Other: (give the technology)	none	none	none

Which of the following technology and artificial intelligence are your lecturers using in classroom to enhance teaching and learning?

TECHNOLOGY	ALWAYS USES THIS	SOMETIMES USES THIS	NEVER USED THIS
Computer/Laptop		✓	
DVP		✓	
Smart Board			
Tablet			✓
Smart phone			✓
Virtual Reality			✓
Special Scanners			✓
Smart Television			✓
Microsoft Office	✓		
JAWS			✓

List, at least top five, technology devices/application you are comfortable with in class? Why?

Participant's Response: *Ah, we use um, Microsoft Word, we use ah, Excel, we use um, okay…we okay it's Microsoft Word and PowerPoint, and okay, we also used Outlook okay, the fifth one is running away, and okay…it just run- it just ran away but… we use eh eh a couple of numbers of applications for- in our classrooms.*

Researcher: Okay, the devices like laptops, cellphone, printers.

Participant's Response*: We use laptop, we use our Laptops and to to print we obviously use Printers, so most of the things we deal with in our classrooms it's printers and the laptops only. PowerPoint Projectors. Most of the technology we use in the classroom is the printers and laptops.*

Which technology do you wish to use in class that you are not currently using and why?

Participant's Response*: That will actually make things more easier for us, I think ah laptops will also- eh, I meant Tablets would also be more useful to students because let's say sometimes it happens that, they are more useful and can be, ah, they are portable for students who are not qualified to use the laptops. And again, uhm, this…it just ran away…okay when I recall ah ah I'll send that name, it can also be uses to, for the, the students who find it hard to see, it can also be shown by lecturer and for them to also follow it up on the laptop while they see what the lecturer is actually pointing at.*

Researcher: You guys don't use, you didn't mention DVPs, the projectors, PowerPoint projectors, you didn't mention.

Participant's response: *That's what I am talking about. I'm talking about the projector. I did mention it, sometime, eh. Did I say we use most of the time? We use most of time.*

Research Question 1:

What are the feelings, attitudes and perceptions of students toward the integration of ICT in their inclusive classrooms at TVET colleges?

Question - Researcher	Participant's Response	Probe - Researcher	Participant's Response
6. How do you feel about	Since I love working with technology, I		

using technology in the classroom?	enjoy it more than the actual books. So, technology for me does it well, and it makes me understand what the lecturer is teaching and it also makes it easy for me to be able to work with whatever that is being presented to me via technology. It actually makes everything easier for me. It actually makes it easy for me to understand whatever I'm being taught. So, I enjoy working with technology in class.		
7. Do you think ICT integration has changed (ways of teaching) your learning strategies? Why?	I think it has played a huge role, cos, there are things that eh, can, eh, couldn't be understood in an olden way but now the ICT integration has also made things to be much simpler for students to understand and it actually shows them these much easier way of understanding whatever they are being taught. So, I think it has made, eh, things much better for students.	Okay, Why do you think so? Okay.	Because most, eh, ok, the system we are living in now, everything is more technological, so, everything is more modern, we are learning to adapt in the lifestyle that we live in, so, most of the things that we use are technology. So, if we do not use technology, if we do not adapt in using technology it becomes hard to know, to understand what we are being taught. So, now if we are being taught eh, using more technology it makes it more easy for us, since we are now using more of technology, so, everything becomes a bit simpler than the old way.
8. What is your opinion about ICT integration in inclusive classroom? (A classroom that has students with disabilities and students without	Ah mh! Ok, Technology, for students with disabilities and also students that do not have disability, I think it's fair to both of them but now it depends on the type of the disability that the students have. Let's say for example blind students, and they	Okay.	

disabilities)	cannot see, it also depends if the projector is being used in that situation it's hard for the students who cannot see, but then for those who can see, it works for them but now for those who cannot see it's a bit of a challenge, but then technology is also good on both of them, let's say for audio on those students who are blind they can hear on what is being said, and on what is being taught in class and also on those who are able, it's also fine for them, it works well. So, I guess it's also fair on both of them.		
9. Do you think ICT is imperative (important) in learning? Why?	Ah, I think it is important. I think it is important for learning.	Why? Okay	As I had mentioned that it helps us, students to understand things more better. I also think that it also prepares us for the outside world when we need to go and work, cos obviously when we learn the main aim, the main purpose is for us to be able to work in the industries that we are trying to be qualified for. So, when we use the ICT in classrooms, I think it prepares us much better and it actually makes us be more suitable to be able to go work in the outside world.
10. Do you think all lecturers must use ICT in their classroom? (It should not be limited to computer lecturers but all subjects)	I think.	Is your network okay?	I think That would be my conclusion to say, ah, I think it should be used by all lecturers, not only provided to the lecturers that teach computers in a world that is using technology. So, for all of them to also be able to understand eh, the use

Why?			or importance of ICT in classes, in classroom they also should be exposed to using them not only on the computer lecturers one.

Research Question 2:

How does ICT integration influence academic performance of students at TVET colleges?

Question - Researcher	Participant's Response	Probe - Researcher	Participant's Response
5. Has there been any difference in your academic performance since you started using ICT in your studies?	Yes. Um, I like um my academic performance. I'm happy with the results that I ah, I performed, with my academic ah results performance, and I'm happy cos those results are produced by the use of ICT in classrooms, that's why I am happy with my results.		
6. Do you think that ICT integration is implemented in a way that benefits students? Why?	It does.	In their academic performance.	It does. It does, If the student understands it and knows how to use it well. It does benefit them a lot.
7. How does technology make everything faster, closer and easier?	Yes, it does.	Why do you say so?	Um Let's say for example you need to send something, or a document, if it wasn't for technology you'll have to, you'll need to take that document to whoever that needs to get that document but now, since, eh, via the connections of the laptop, let's say for example

			you can send the document via Bluetooth or mainly you can send the document via an email which make things much easier and faster, and it also saves time. And let's say for example you need to write a letter, you can use a Microsoft Word to write and more eh, clear and neat eh letter and then you can also send and retrieve it when you need it for personal use, but it's much quicker, it saves time and it's simple to use
8. What do you think is the role of technology in a students' schooling life? (While they are still in school)	The role of technology in students while they are still in school? If I heard you clearly cos the network just cut us there. The role of technology?	Yes. In assignments, is it	The role of technology in students while they are still in schools, I think it's it's more important and it's it's a vital role cos they use technology to improve their knowledge. And The technology uses, I meant, eh, the technology that they use helps them to understand eh the things that they need to know in order for them to be able to better persons when it comes to future planning and their dreams; and it also helps them to know how to communicate with people in certain industries and in different parts of work industries, cos, with technology it helps them to know how to plan some future things and also how to be able to communicate with different people, cause we meet different people in different environments. It also prepares.

		helpful?	Yes.
		How?	It is very helpful. Wait, When doing your assignment, with technology, you can do research. And if, With assignment, let's say for example, you don't understand something, you can be able to connect with someone who will be able to help you, you use technology. And
		Okay.	Let's say you need to have um, eh, let's say for example pictures of certain eh eh project that you are working on, with technology you can be able to use internet to be able to get whatever that you need, of which if you didn't have the technology that we use, you wouldn't be able to get all that. So, I guess with assignments it helps us a lot to be able to practice.

Research Question 3:

What challenges and benefits do students at TVET colleges experience with ICT integration in their inclusive classrooms?

Question - Researcher	Participant's Response	Probe - Researcher	Participant's Response
7. What challenges do you encounter when using ICT in your classroom?	Um, The challenges that I encounter, most of the time let's say, it might be the shutting down of the system, or it might be the network when we have to print, and, but mostly I can say it's the user challenges, cause if I fail to remember something, I will be the one encountering	Okay.	

	the challenge to remember how to solve that problem. But most of all I can say it's the shutting down of the network or and not able to connect to the internet		
8. What are the advantages and disadvantages of ICT integration in your classroom?	Advantages of ah using technology in class?	Yes. Okay, Give me three. Okay, The network has started. Okay, Hello. *Connecting again via MS Teams* Okay, I lost you. I lost you there. I lost you! Okay. I think we are back now. I can hear you. Can you hear me? Okay, You were	There are many. I enjoy working, okay, I'm sorry about that. Okay, I think we are back. I also couldn't hear anything. Are we back? Can you hear me, now? Alright, That's better. I can hear you, yes.

		explaining advantages. Yes.	Of using eh eh technology in class? So, I was actually, explaining that I enjoy using ehm, the technology in class. Advantage is that it makes it easy for me to be able to understand most of the things that we work with and it also make it easy for me to understand most of the things that we have to encounter when we go to the out world, which is the work industry. And working with the different apps that are found in the laptop or in the technology that we use mostly in class they are easy to use and they are mostly easy to understand, so, it makes life more easy and makes it easy to understand and communicate with others using those applications. For example, using Word, it is easy to use and ah, the methods that are being used to work with it, it's also easy and simple; so it cannot be hard for one to understand, and also the PowerPoint, the manipulation that we use and all that, it's easy to understand, it cannot be hard to understand when you enjoy working with technology. So, with me it's all easy since it's eh, technology, so, I understand most of the applications, I understand most of the things that I am being taught in class because it is easy and it's the technology that I enjoy working with. It's more advantages than disadvantages for me.

		What are the disadvantages? If there are there. Okay. Okay. Okay. Okay. Alright.	Okay. Let's see. It can be power cut but I have never experience that one. But, let's see the disadvantages that can be there in class when using technology: charging the battery, it happens that the battery just dies and you have to find a charger. Let's say it happens that there is no charger, that might be a disadvantage, that is a huge disadvantage cos, let's say the user didn't save the work, then the work is lost. That can be a disadvantage
9. How is ICT integration beneficiary for you as a student now and in the future?	Right now, it is very much beneficial, it is very much helpful for me because, I'm learning new things and so far the things that I have been taught in class they help me to be able to work with other people. For example, I have been ah, volunteering in eh, different institutes, if I can say eh, in different workplaces, with the knowledge that I have found in the ICT that I have been using in class. It has actually helped me a lot to be able to improve eh, my skills, and it actually helped me a lot to see that I can be able to use what I've been learning in class and be able to use it on people. For example, I am able to practice	OK.	

	what I use, what I learn in class and do it very much well when I am in the workplace. And I've noticed that the way that I do, it is actually similar to those I've been working with because it's exactly what I've been learning in class. And It is very much beneficial when it comes to work the work in the department and I think it is very much helpful for me in future because I'm able and have been taught in class using the technology and it will be very helpful when times go by, because, cos things are improving, new things come in and it's ICT, we keep on learning.		
10. What kind of support do you get from your lecturers in case your technology (e.g., computer) is not working?	Okay, so, all, the most problems that we ah encounter is the user problem. That one, when you have forgotten something, the lecturer will help you remember but not do it for you, so, that is the most grateful support that I am always appreciative of. They do not do it for you but they try to make you recall so that you do not forget next time on how to apply whatever it is being said to you in the application that you are working on. And then one thing again, our lecturers are very good ah, at teaching you eh, something that is on the laptop and you'll be able to work on it even when you are alone, not with them present with you all		

	the time, let's say, not always in the classroom, but can also recall how to work on it when you are at home, not always not always in class. So, I can just say they are very passionate with eh, teaching or lecturing eh, the students on knowing how to manipulate or how to work with eh, the technology that we are presented with in class		
11. Do you think there are students and lecturers who experience fear of the unknown when it comes to technology? What do you think can be the solution/s to this fear?	Who experience?	Fear. Who are scared of using technology.	So, far, I haven't encountered such a situation where I can say there is a student or a lecturer who is afraid to use technology. But, I can that maybe if there was a lecturer who was old they would find it hard to work with technology since they always find it like, it's hard to learn and adapt to, but so far, I haven't experience the situation whereby um, I think the lecturer or student is finding it hard to use technology
12. What digital divide exists between students and lecturers; and how can this gap be closed?	The gap between students and lecturers using technology? My view on that one, so far is yes. You were saying, meaning?	No, ah, can you hear me? I was saying the belief is that there are digital immigrants and there is digital natives, students are born in the era of technology, they use it all the times as compared to lecturers, who only get to learn it later and it's a struggle for them. Do you witness that in your	Yes, I can hear you. Not really. I do not witness that cos I feel lecturers are much prepared and are learned when it comes to technology, and now they have to try to make these students that are born in the era of technology understand it more, because there are also other students who find it hard to understand technology. But, They are mostly prepared with technology and understand it very well. But, maybe others do encounter such problems but so, with my lecturers they are good with the technology

		classrooms?	there.

Research Question 4:

How can the students' experiences of ICT integration at TVET college be used to form guidelines for TVET college stakeholders?

Question - Researcher	Participant's Response	Probe - Researcher	Participant's Response
4. What changes do you think should be made, if any, on how ICT is integrated in your classrooms?	Um, changes that should be implied in our classrooms when it comes to ICT. I think-	Not only in your computer class but in all subjects. Okay.	Okay. I think if we can have enough um, learning equipment, for example, laptops. If laptops can be enough for all the students that can be very much helpful; and it won't be hard for each student to understand. For example, not having to share a laptop with another student, so that each student can be able to see what is being taught in eh class, that can be very much helpful. And enough, let's say printers, let it not be one printer in a classroom since the classroom might not have 10 students or 20 students. So, If the students want to not wait for, let's say others maybe who are printing already which might cost them time. Let's say maybe, if there are two others can use another and us can be using a different one which makes it easy to see if what they have done is wrong or right and also ask for the lecturer to help them. And then other thing to be improved in

			classrooms, eh, remove the keyboards.
		Mhm.	We can Remove the keyboard so that we can learn how to work with a plain laptop in my classroom.
			I think the network has gone bad again.
		Okay, Keyboards, where? *(network problems)*	
			I can hear you, ma'am.
		Okay, remove keyboards, where? *(network problems)*	
		Can you hear me? Yes?	Yes, the attached keyboard, the extra connected keyboards. They should actually leave the originated keyboard of the laptop, obviously which is, cannot be removed, they

		Okay, The network is doing the things again. You said they must remove keyboards? Oh, okay.	should just leave the own laptop not the connected keyboards.
5. Are you allowed to access internet or use Wi-Fi in your classroom? If yes, how often. If no, why not?	We can only use WiFi in the classroom only if it's beneficial for the class work or the school work. We, you cannot use WiFi in the classroom for your own for when the lecturer is teaching. You can only use WiFi in the classroom when you have to access something that is related to school work during the lecturers' time.	Okay. And then, internet?	We do not use internet most of the times in my classroom. We do not use internet most of the time unless you have to search up something that is important, that is being needed during that time, but *(shook head to indicate no)*
6. What limitations are there on what technology to use in class and when to use it?	Alright. If I understand the question clearly, like the limitations to the technology that we use in class. For example, I can, the cellphone, if I can make an example, we cannot use the cellphone in class, the laptop, we can use the laptop in class since it's the lecturers time and we have to use the laptop in order for us to learn, so the, limitation to that can be the duration of the period of the lecture, we can only use the laptop for that duration, until the class is over, but as the cellphone,	Mhm. Okay. And then, your classmates, in an inclusive classroom, you get to have students with	

	then you cannot use the cellphone since it is not part of the classwork. You can only use the laptop in order for you to do the classwork not the cellphone or personal use. Only what is connected to school.	disabilities and students without disabilities, does that affect the use of technology? I can hear you.	Eh, I have, eh, sorry. Uuuwee!. Okay. Are we back? Sorry about that, I didn't hear you, sorry about that. With a situation like that, where there is a student with a disability, I have not encountered a problem with that. But then, I remember there was one student with such disability, so, when it come to that, it becomes difficult a little sometime because a lecturer also needs to give more attention to the student who has a disability and also divide attention to also the students who do not have a disability, so, you have to be, eh, more patient also as a student cos, remember you are not alone but you also have to give sometime to the student who has a disability, so, you have to listen more carefully in class so that you can be able to understand as the student who do not have a disability. I feel like they are the ones have to listen more in class cos they cannot be given extra attention compared to the students

		Okay, but have you experienced being in a class with a student who has a disability? Okay. Okay.	that has disability, so it becomes a bit challenging sometime if you do not understand a certain question, or if you did not understand the lecturers explaining because you might also need his attention or her attention and then the time also has to be given to the student who has a disability, so it might be a bit hard for the lecturer to attend both of you at the same time. No. The only person that had a disability, it was not a disability that would make it hard for us in class to be able to learn cos he could see but in a wider, eh, I don't know what do they call it, but the text should be zoomed so he could see more clearly mostly, almost like us but the text should be zoomed for him to see. So, it was only just, eh, one student in class
Anything else that you want to share with me that I did not ask you? Or question.	Let's see. Are we allowed to eat?	I didn't get that. Okay.	I don't think students are allowed to eat in class while working with technology.
And then, eh, I'm trying to think. Okay, the relationship between you and other	With me, what I enjoy a lot is helping other students, cos, as I had mentioned that I enjoy working with technology, so I find it	Okay.	

students in class. Are students helping each other in the classroom?	easy to understand and work with, so we help each other in the classroom, if there is one student that doesn't understand or find it hard to understand, we help each other to understand and be able to finally get it right, so, the classroom that I am in, students that I am with, they are great help. And they are able to work with each other, just greatly, and they help each other to, to be able to, to come with terms with whatever that is hard for them that they ask other students who understand, so, I guess we help each other.		

APPENDIX J: SAMPLE TRANSCRIPT 2

Transcript: NCVL4S2-IIIP

Short Questionnaire

Which of the following technology do you use in the classroom?

TECHNOLOGY	ALWAYS USE THIS	SOMETIMES USES THIS	NEVER USED THIS
Computer/Laptop	✓ (engiyisebenzisayo ile engiyithole e-Disability Unit)		
Voice Recorders			✓
Tablet			✓
Cellphone/Smart phone	✓		
Virtual Reality			✓
Other: (give the technology)		C-Pen/Reader Pen	

Which of the following technology and artificial intelligence are your lecturers using in classroom to enhance teaching and learning?

TECHNOLOGY	ALWAYS USES THIS	SOMETIMES USES THIS	NEVER USED THIS
Computer/Laptop		✓ in L. O. classes	
DVP			✓
Smart Board			✓
Tablet			✓
Smart phone			✓
Virtual Reality			✓
Special Scanners			✓
Smart Television			✓
Microsoft Office			✓
JAWS		✓	

List, at least top five, technology devices/application you are comfortable with in class? Why?

Participant's Response*: Eh, Laptops, reader pen, and there is software, eh, dragon software, ZoomText, and then which, wait, eh, I think that's four.*

Researcher: So, you said, "Laptop, reader-pen, dragon and ZoomText"?

Participant's Response: *Yes, ma'am.*

Researcher: Okay. Why do you like using these software?

Participant's Response*: Me, I prefer i-ZoomText because ZoomText read it back for me and also i- Dragon. And then the reader-pen, Mmhhh.*

Researcher: What is good about ZoomText?

Participant's Response*: ZoomText, I type and i-reader (it reads) back to me*

Researcher: And Dragon?

Participant's Response: *i-Dragon, I say the word, it types the word and read it again.*

Researcher: So, you say the word and then it types it? And it reads it back for you?

Participant's Response: Yes, ma'am. It do read it back for me.

Which technology do you wish to use in class that you are not currently using and why?

Participant's response: *Currently, we don't use anything now.*

Researcher: Which one would you wish to use?

Participant's Response: *Eh, Dragon.*

Researcher: So, you're not using Dragon now?

Participant's Response: *No, ma'am. We don't use that now. Asiyisebenzisi (we are not using it) at all. Benginayo (I had it) in my previous laptop.*

Researcher: So, you were using it previously?

Participant's Response*: Yes, ma'am.*

Researcher: Okay. Any other technology you wish to use now?

Participant's Response*: Yi-Dragon kuphela (only) for now, because, yah, i-Dragon.*

Research Question 1:

What are the feelings, attitudes and perceptions of students toward the integration of ICT in their inclusive classrooms at TVET colleges?

Question - Researcher	Participant's Response	Probe	Participant's Response
11. How do you feel about using technology in the classroom?	I think ku-simple *(it's simple),* ku-simple for thina *(it's simple for us)*.	Okay, explain.	I-simple for thina *(it's simple for us)*, eh. Ah, for ama – assignments *(the assignments)* and with ama-readers *(the readers)* because sometimes ama-lecturer awa-understand *(the lecturers don't understand)* and they are impatient. Technology ingaba-good *(would be good)* for disabled people.
12. Do you think ICT integration has changed your learning strategies? Why?	Ma'am, come again. Yes, it do change a lot.	Okay, explain	Ah, ba-impatient *(they are impatient)* and, then, ah, aba-explain *(they don't explain)* more further, when it comes to ba-explain *(explaining)*, more specially to blinds and dyslexic abekho *(they are not)* that patient enough. As in now, kuphume ama- assignments *(assignments were distributed)*

			kune *(there is),* there is a blind student ongatholanga *(who didn't get)* ama-assignments *(the assignments)* because siwa-receive *(we received them)* via WhatsApp. And then masimbuza *(when we asked him/her)* uthi *(he/she said)* she thinks ukuthi *(that)* yithombe nje *(it's just pictures)*, normal pics, never asked anyone ukuthi amfundele *(to read for him/her)*. Via WhatsApp, yes ma'am. Akakwazi *(could not)* to scroll down.
		So, they sent assignments to everyone via WhatsApp? So that student was not able to …… Okay. Your way of learning, neh, before you had laptop and other things, is there a difference from the way you were learning before and the way you are learning now that you are using technology?	I think sekune-technology *(with technology)* now, it's a bit easy than before. Ah, when it comes to ama-assignments *(the assignments)*, sengiyakwazi *(I am able)* ukuthola

		How?	*(to get)* umuntu *(someone)* ozongisiza *(to help)*, a-rough sketch *(with draft)* ephepheni *(on paper)* and then ngizi-typele *(and I type) mina (for myself)* when I get home.
13. What is your opinion about ICT integration in inclusive classroom? (where a student with disability and students without disability are in the same classroom.)	Eh, for mina *(me)* I think i-right *(it's right)* so far.	Okay, explain. Okay. And then, others? Okay. You, as a student with a special need, are you comfortable with learning in a classroom with other students who	Yes, ma'am. Thina *(we)*, eh, it depends with, eh, a lecturer ukuthi *(on)* u-responder kanjani *(how she responds)* to you. Ah, for now, it depends with a lecture because i-lecture yami ye Life Orientation *(my Life Orientation lecturer)* u-patient *(is patient)* and uya-understanda *(is understanding)* and helps me a lot. Others, there are some that are patient and there's some are not patient, yah, eh, two. And seem not to understand what is happening nge-dyslexic *(with dyslexia).* I'm comfortable. Because, ah, I see myself different than them but,

		don't have special needs? Okay, why?	angifuni *(I don't want)* ukuzi-down-grader *(to down-grade myself)* ngithi *(and say)* I'm special like. Mangiseclasini *(when I'm in class)* ngizibona *(I see myself)* ngifana *(similar)* nabo *(to others)*.
14. Do you think ICT is imperative (important) in learning? Why?	I think kungaba *(it would)* into e-right *(a nice thing)* ukuthi *(for)* wonke *(all)* amaclass *(classrooms)* abenayo *(to have it)*.	Why?	Eh, kuzoba *(so that)* with printing, sizo-printa *(we can print)* khona *(there)* eklasini *(in the classroom)*, then. Eh, with this COVID-19 abasasiphi *(they no longer give us)* ama-assignment *(the assignments)* handini *(in our hands)* and then kungabalula *(it would be easier)* if each and every lecture abe ne-printer *(has a printer)* eklasini *(in the classroom).*
15. Do you think all lecturers must use ICT in their classroom? Why?	Yes, I think so. I think kungaba-right *(it would be right).*	Your reason? What is your reason? When you submit, do you submit paper?	The reason, I think for this COVID-19 kuzoba *(it would be)* much easier because abafuni *(they don't want)* ukusipha *(to give us)* wona *(them),* eh, ama-assignments *(the assignments)* ngezandla zabo *(using their hands)*. Some bazitshela *(tell themselves)* ukuthi *(that)* ba-prifela *(they prefer)* ukuthi *(that)* basisendele *(they send them)* kuma *(via)* WhatsApp, and thina *(we)*, we just submit the assignments. Yes, ma'am. Or siwathumele *(we send)* wona *(them)* via e-mail and then eklasini *(in the classroom)*, and then bona *(they)* will mark it, and then basibuyisele *(return)* back ku-emails *(via e-mails)* or print it in class bona *(themselves)*, kube *(so that)* yibo *(it's them)* kuphela *(only)* ababamba *(who handle)* amaphepha *(papers)*

			ama-assignments *(of the assignments)*.
		Okay, I am not getting this one. You are saying, lecturers send you assignments via WhatsApp?	WhatsApp, yes ma'am.
		And then you guys send them back via e-mail?	Via e-mail, yes or not si-submit *(we submit)* back kubo *(to them)* in hand-in.
		So, when you submit, you print and submit?	We print and submit.
		Okay.	We print and submit.

Research Question 2:

How does ICT integration influence academic performance of students at TVET colleges?

Question	Participant	Probe	Response
9. Has there been any difference in your academic performance since you started using ICT in your studies?	Ma'am?	So, if you compare the time you were in school and you were not using technology to the time that you are now at TVET using technology, do you see a	Mmhh, there is no difference right now. Because, ukungasebenzisi *(not using)* i-technology *(technology)* I think that time was easy, just now kuba *(it's)* more difficult.

		difference in your performance? Why is it difficult? I am saying neh, let's say neh, when you were in school you were getting 40s or 30s in your tests, now that you are using technology maybe you are getting more or maybe when you were in school you were getting 60s and now that you are using technology you are getting less like 20s. Is there a difference like that, that you see?	If I understand the question like that? Oh, a difference like that, eh, with technology ngithola *(I get)* ama-marks *(marks)* are more extra because, kuma *(in)* spelling checks sengiyakhona *(I am able)* ukuchecka *(to check)* ku-laptop *(on the laptop).*
10. Do you think that ICT integration is implemented in a way that benefits students? Why?	Yah, I think technology iba-treat the *(treats them)*, isiphatha *(treats us)* the same. Because nabo *(their)* ama-marks *(marks)* aya-improva *(are also improving)*, if I can say so.		
11. How does technology make everything faster, closer and easier?	Ma'am?	How does technology make everything faster, easier and closer?	Eh, for me, ngingayirater *(I can rate it)* in numbers, I will say 80%

		80% of it faster, easier and closer? Okay. Why do you say so? Why do you say so? What sort of improvement?	Faster. Yes, ma'am Eh, ngizibona *(I see myself)* for mina *(me)*, eh, I see myself ukuthi *(that)* ngi-improvile *(I have improved)* than previous years. Izinto eziningi sengiyazi-understenda *(I understand a lot of things)* kanti *(and)* ne-participation *(participation)* eklasini *(in class)* seyi-different *(is different)* than, eh, two years back, I say.
12. What do you think is the role of technology in a students' schooling life?	Eh, technology, I think kuma *(for)* students izene *(brought)* something that, eh…., it changed a lot for us.	How? Okay. Why do you google?	Siyaresearcha *(We research)* kwi-internet *(on internet).* And then we are always ku-Google *(on Google)* to find valid information. Google for information nami ezongenza ukuthi ngi-improve, ngi-understand ukuthi i-assignment ingani. *(Google for information that will make me improve and understand what the assignment is*

		So, you google for assignments?	*about)* For assignments, yes.

Research Question 3:

What challenges and benefits do students at TVET colleges experience with ICT integration in their inclusive classrooms?

Question	Participant	Probe	Response
13. What challenges do you encounter when using ICT in your classroom?	Ngiba ne-frustration if into angiyi-understand *(I get frustrated if I don't understand something)*	Something like what? Is that mail merge?	Eh, as in now, there is …. For now, since sibuyele *(we came back)* e-college *(to college)* asikayi *(we haven't been)* kuma-LO classes *(to LO)* but izinto *(things)* ezi.. eh, there's … ngiyikhohliwe igama layo *(I forgot what it's called)* but izinto zakhona kumele uzihlanganise *(we must combine things)* in one paper, and then mayifika lapho ngivele ngibefrustrated *(when we get to that, I become frustrated).* Mail merge, yes, ma'am, mail merge. Iyangifrustrata *(it frustrates me).*
14. What are the advantages	Disadvantages?	Start with advantages and	Disadvantages, eh, I will say, eh, learning

and disadvantages of ICT integration in your classroom?		then disadvantages. Start with advantages and then give me disadvantages as well. And then, disadvantages? Any other disadvantage?	progress. Okay, advantages i-understanding, learning and then noku-progressa eklasini *(and progress in class).* Disadvantages, eh, if I don't understand or eh, isikhathi sifike *(time is up)*, eh, i-period iphele singakaqedi anything else *(the period end before we finish)*, and then ngisemuva *(I am behind)* toward everyone eklasini *(in the classroom)*. Disadvantages? Eh, no.
15. How is ICT integration beneficiary for you as a student now and in the future?	Iyenza i-life more easier than, yah, more easier.	How? Okay, in the future?	Eh, because izinto ezinye sengiyakwazi ukuzenza kwi-laptop and also with i-phone, smartphone. *(I am able to do a lot of things for myself on the laptop and smartphone)* For me I think it's much easier. In the future ngibona ngathi izosi-uplifta because sekunama-software ayenz' ukuthi, eh, asifundelayo, ukuthi si-understand more. *(I think it will uplift us because there are software that can make, eh, that reads to us so that we can*

			understand more) Like i-dragon neZoomText *(Like dragon and Zoomtext)* In the future izongisebenzela kahle *(it will work for me better)*, more especially i-Zoomtext *(Zoomtext)*, because i-Zoomtext *(Zoomtext)* as you type mawuthi *(when you)* space it reads ukuthi sewubhaleni *(what you have written),* also again, and then i-Dragon *(Dragon)* for ukuvula *(opening)* your emails and your files i-much *(is much)* better than i-Zoomtext *(Zoomtext).* Those software, yes ma'am. They are usable.
		Software like which one? How is Dragon and Zoomtext help you in the future? Meaning when you are in the office, when you get a job, you can use those software?	
16. What kind of support do you get from your lecturers in case your technology (e.g., computer) is not working?	Support, eh, i-support, I will say, I will rate it 40%, also it depends ukuthi ubani okusizayo *(on who is helping you)*, but for me towards ama-lecturers *(compared to lecturers)* I prefer ukusizwa ama-classmates *(to be assisted by my classmates)*.	You prefer classmates? Okay, why? Please repeat, I didn't hear	I prefer my classmates than ama-lecturers *(the lecturers)* Ama-lecturers *(lecturers),* eish, I think when it comes to i-disability *(disability)* abayi-understand *(they don't understand it)* and ……(network glitch) I said ama-lecturers *(lecturers)* I think ukuthi

		that.	*(that)* aba-understand *(they don't understand)* what is disability, bona *(they),* they think ama-disability ayafana *(all disabilities are the same)*, basi-rater *(they rate us)* the same as the blind students.
17. Do you think there are students and lecturers who experience fear of the unknown when it comes to technology? What do you think can be the solution/s to this fear?	Ma'am?	Do you think there are students and lecturers who are scared of using technology? So, you have never encountered anyone who was scared of using technology?	No. I don't think so. Angikaze. *(I have never)*
18. What digital divide exists between students and lecturers; and how can this gap be closed?	Yes, I will say yes.	Okay, explain. Try. But do you think, you as students, you know more	Eh, i-technology is, for now, konje ngizothini *(what can I say)*, everyone u-understanda *(understands)* more when i-technology than, eh, angazi ngingayi-explaina kanjani *(I don't know how can I put it)* in a simpler way. Okay, I think i-technology helps us more than ama-lecturers *(lecturers)* in class. I would say yes.

		about technology compared to your lecturers? That's what I want you to explain. I want explanation.	I would say yes, because, eh, I think I would say yes, just yes. I can't explain it. I think because some, eh, there is a learner and a lecture, uma enga-understand ubiza *(if he/she doesn't understand he/she calls)* some of ama-students *(students)* like kwi-LO, ukuthi bazomsiza *(like in LO, to come and assist him/her)*

Research Question 4: How can the students' experiences of ICT integration at TVET college be used to form guidelines for TVET college stakeholders?

Question	Participant	Probe	Response
7. What changes do you think should be made, if any, on how ICT is integrated in your classrooms?	Eh, mabanga-trainer ama-lecturers *(if they can train lecturer)* with different types of disabilities and, eh, even though namanye ama-students engekho disabled *(some other students are not living with disabilities)*, basitrithe *(they treat us)* with, eh, the same. Because ama-background awafani *(backgrounds are not the same),* maybe someone is good but something happened endlini *(at home)* and then eklasini akasabi *(in class, he/she is not)* as normal.	Okay. With technology? They must give to students?	Ama-laptops and computers, yah, angaba-right for ama-students *(Laptops and computers would be right for students)* Yes, banikeze ama-students *(they must give to students)*
8. Are you allowed to access internet or use Wi-Fi in your classroom? If yes, how often. If no, why not?	Yes, we do allowed.	Okay. How often? Okay, why do you use it? Why do you use internet and Wi-Fi in the classroom?	Eh, it depends. I will say ngingayirater *(I can rate it)*, eh, I will say now and then. Ma'am? To research. Some other times ama-computers anokuba slow,

			mawuyichecka kwi-phone i–wifi i-right *(Some other times computers become slow, when you check on the phone the Wi-Fi is right)*
9. What limitations are there on what technology to use in class and when to use it?	Mhhmm, iba *(it's),* if kunento okumele siyi-research or kunento esingayi-understand and then siyayisebenzisa ke lapho i-internet kuma-smartphones, mangabe asi-understandanga i-lecture *(if there is something we must research or there is something we don't understand and then we use internet on smartphones, if we don't understand the lecture)*	I am saying, limitations, like for example, you say you want to use it more but you can't because of this and that. What are the limitations? I am saying, there are rules in the classroom, for example, you can't use your cellphone or you can use your cellphone. Do you have any rules like that? Do you have any challenges that you see with using technology? Not advantages, not disadvantages, just challenges?	More especially when it comes to i-Life Orientation, asiyisebenzisi i-Wi-fi *(we don't use Wi-Fi)*, sisebenzisa *(we use)* connection yamalaptop *(of the laptops*), and then eyaseklasini (for the classroom) if asi-understand *(we don't understand)* anything, if ngiyi-understanda kahle i-question yakho *(if I understand your question correctly)*, if asi-understand i-lecture ukuthi ithini *(if we don't understand what the lecture is saying)* and then usipha i-allowance ukuthi si-research *(he/she gives us allowance to research)* and search. Eh, no, ayikho *(there is none)*. The only thing that they would tell us sifake ama-phone ku-silence when singena eklasini *(to put our phones on silence when we enter the classroom)*. We use it only when it's that time to use it. No. I don't have any.

APPENDIX K: DECLARATION OF PROFESSIONAL EDITING

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Declaration of professional edit

TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING STUDENTS' EXPERIENCES WITH INFORMATION AND COMMUNICATION TECHNOLOGIES INTEGRATION IN THEIR INCLUSIVE CLASSROOMS

By

THEMBELIHLE GUGULABASHA NDLOVU

I declare that I have edited and proofread this thesis. My involvement was restricted to language usage and spelling, completeness and consistency and referencing style. I did no structural re-writing of the content.

I am qualified to have done such editing, being in possession of a Bachelor's degree with a major in English, having taught English to matriculation, and having a Certificate in Copy Editing from the University of Cape Town. I have edited more than 200 Masters and Doctoral theses, as well as articles, books and reports.

As the copy editor, I am not responsible for detecting, or removing, passages in the document that closely resemble other texts and could thus be viewed as plagiarism. I am not accountable for any changes made to this document by the author or any other party subsequent to the date of this declaration.

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APPENDIX L: ORIGINALITY REPORT FROM TURNITIN

Technical and Vocational Education and Training Students' Experiences with Information and Communication Technologies Integration in their inclusive classrooms

ORIGINALITY REPORT

8%	7%	2%	4%
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