Cape Peninsula University of Technology

The role of School Management Teams (SMTs) in Information Communication Technology (ICT) integration in the curricula at public schools in Cape Town.

by

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This research project: dissertation was submitted in fulfilment the requirements for the degree

Master of Education

in the Faculty of Education

at the Cape Peninsula University of Technology

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Mowbray Campus
Date submitted 31st October 2022

Declaration

I, Tina-Jane Oladokun (Hendricks), declare that the contents of this thesis represent my own unaided work, and that the dissertation/thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology and that all sources that has been used or quoted has been indicated and acknowledged as complete reference.

_____ 31st October 2022

Signed **Date**

Abstract

A substantial percentage of SMTs held adequate knowledge about ICT integration at their schools but lacked the required leadership skills to influence the overall integration into the curriculum at their respective schools. Alternatively, SMT members' perceptions had a significant impact to the extent in which they integrated ICT at their schools, which might hinder them from overall success in integrating ICT. This study investigated the leadership role SMTs have in ICT integration into the curriculum at their schools. Furthermore, the study attempted to investigate the key factors that could affect SMTs leadership role at their respective schools. By, analysing the perceived perceptions on ICT and their specific member roles at the school. The framework of Day and Sammons (2013) underpin this study.

The research sample comprised of ten SMT members from High schools in the Metro East District in the Western Cape. The study used the following research instruments for data collection namely:

1. Focus group discussions and
2. Individual semi-structured interviews.

An interview schedule was employed to guide discussions and interviews on specific dates that were made available by SMT members at the two schools. The discussions and interviews were done by all SMT members irrespective of their specific role at the school to gain a collective view of ICT integration at their school. Qualitative methods were employed in this study to analyse the data to explore the perceptions of SMT members towards ICT integration.

The analysis of the data showed that SMT members who participated in this study have derived perceptions about ICT both positive and negative due to individual experiences when using ICT at their schools. SMT members often felt that the role of ICT integration should be delegated amongst themselves and or outsourced completely for those members who are technologically challenged. However, in school B, SMT members felt very positive about ICT integration and its endless benefits into their curriculum. Thus, having a more positive perception about ICT than school A. In terms of age, the younger SMT members appeared to be more knowledgeable about ICT than their older counterparts. With relevance to ICT integration, the SMT members seemed to demonstrate a better understanding of ICT terms than the actual implementation of ICT into the curriculum. Thus, labelling ICT as a “tool.”

However, based on the data collected, it was found that differences between SMT members were only significant in terms of integration, curriculum practices and implementation. This study offers several recommendations for the SMT members to consider as well as suggest ways, which could be used to integrate ICT into their curriculum.

Acknowledgements

I wish to express my heartfelt gratitude to my supervisors, Professor Agnes. Chigona and Dr. Nyarai Tunjera, for their continuous support, patience, and motivation during this study. Your comments, encouragement, patience, and continuous calls during my study were needed. You are so blessed, and I was so honoured and privileged to have the two women as my supervisors. May God continue to bless you and your family. I give special thanks to Professor Agnes Chigona, a role model in the field of research, who always so passionately motivates everyone around you to do their best. Thank you for your expertise, your endless patience and for believing in me. Your in-depth constructive feedback helped me so much to better my level of academia to complete this thesis. Lastly, I hereby say a tremendous thanks to my family, especially to my exceptional husband for all the prayers and late-night snacks throughout this journey. You have always encouraged me to do my utmost best in everything. You have gone beyond to make things easier during this journey. All honour and praise belong to the almighty God, who made all this possible and finally brought this thesis to its conclusion as a setting stone for what lies ahead. I am in awe of you God, for all you have done and for what you are about to do.

Dedication

This research is dedicated to the Almighty triumphant God who made all this possible and saw me through this Masters' programme.

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Abbreviations and acronyms

CEMIS – Case Execution Management Information System

CPUT – Cape Peninsula University of Technology

CTLI – Cape Teaching and Learning Institute

DoE – Department of Education

HOD – head of department

ICT – information communication technology

SGB – school governing body

SMT – school management team

TPACK – Technological Pedagogical and Content Knowledge

WCED – Western Cape Education Department

DoE- Department of Education

DBE – Department of Basic Education

Chapter 1: Introduction and background

1.1. Introduction and background

The integration of information and communication technology (ICT) across all nine provinces in South Africa is at varying levels of implementation (Mdlongwa, 2012). In fact, the Western Cape ranks as one of the leading provinces in terms of ICT integration in education (Mdlongwa, 2012). Despite the adoption of ICT in education being a focus area on the Department of Education's agenda regarding enhancing quality education in schools, the success of ICT implementation in public schools is not guaranteed (Chigona, 2015).

Since the initiation of educational technology in South African public schools over the last two decades (1995 – 2019), complex factors have been identified that limit the capabilities of teachers and learners in using ICT effectively in public schools. Some of these challenges are a lack of policy and planning, limited technical support, a lack of training, limited time in implementing the curriculum, resistance to change and access to adequate resources (Salam et al., 2017; Van Zyl & Sabiescu,2016). Hence, these complex factors are what Chigona (2015), attests to regarding the failure of effective ICT implementation in South African schools.

The ICT agenda of the Western Cape Education Department (WCED) is quite evident in its initiation of ICT school-related integration (DoE, 2015). For instance, in the South African School policy for principals (2015), the Department of Education initiates various projects, such as the Khanya project (Sadeck, 2016). The purpose of these projects is to link the provision of ICT resources for schools to enhance their teaching and learning. In the latter, the WCED implemented the Game Changer Project. Which was focused on enhancing teaching and learning using ICT in mathematics and languages (Republic of South Africa [RSA], 2015). ICT certainly plays a key role in the delivery of quality education (Salam et. al., 2017). However, the literature

reviewed (Chigona, 2014; Salam et. al., 2017; Van Zyl & Sabiescu, 2016) appears to depict the fact that the capacities and capabilities of South African schools prohibits teachers from using these new forms of technology successfully.

It is against this backdrop that the study aims to contribute by offering direction to School Management Teams (SMTs) and policy makers to take the much-needed action for successful technology integration in schools. Most of the previous studies focused on role players of the schooling systems such as principals and teacher experiences (Chigona & Chigona, 2010; Chigona, 2015; Madoda, 2018; Salam et. al., 2017; Van Zyl & Sabiescu, 2016). These considerations are certainly significant by engaging in the discourse of effective ICT integration in public high schools in South Africa.

1.2 Rationale and purpose of the study

The researcher's perception of ICT in schools is informed by first hand experiences as an IT educator at a high school setting. As the elected ICT Champion of the school and in collaborating closely with the SMT, the researcher has been involved in various administrative, managerial, and decision-making roles about the integration of ICT at the school. An ICT Champion is an individual who has been identified by the school to partake in various courses in ICT integration provided by the Education Department and to report back on the processes to be followed. In this regard the researcher was often left alone with decisions regarding ICT integration at the school with little to no input from the SMT. As an ICT Champion of a high school, the researcher was exposed to challenges that affect ICT integration in schools through various workshop interactions with other ICT champions in the Metro East Education District (Kraaifontein). Issues regarding the integration of ICT practice in schools include but are not limited to a lack of leadership; teachers' unwillingness to learn new ICT skills; shortage of ICT resources and lack of curriculum support. This sparked an interest to further investigate ICT and school management.

1.3. Statement of the problem

The resistance by public high schools' teachers to integrate ICTs seemed to be aligned with the SMT leadership in ICT integration at their specific schools. Thus, the proposed study will be guided by the following research question:

- What is the role of SMTs in the integration of ICT in the curricula of public high schools?

The research question in turn will be guided by the following subsidiary questions:

- What are the knowledge systems, attitudes, and practice of the SMTs towards ICT integration at their schools?
- How do SMTs perceive their role in ICT integration?
- What challenges do the SMTs encounter in ICT integration at their schools?

1.4. Aim

The main aim of the research is to establish:

- The SMT knowledge systems, attitudes and practices that influence their overall perception of and role in ICT integration at their school.

1.5. Objectives

From these broad aims, the supporting objectives that need to be achieved are as follows:

1. To assess and establish the knowledge, attitude, and practice of the SMTs towards ICT integration in the curricula.
2. To investigate perceptions of SMTs towards their role in ICT integration.
3. To identify challenges SMTs face when implementing ICT integration at their schools.

1.6. The scope of the study

This study was limited to two high schools and about ten school management team members consisting of:

1. Two Principals
2. Two Deputy principals
3. Two Head of Department
4. Two Subject advisors and
5. Two Senior teachers.

The study was conducted within the Metro North Educational district (Kraaifontein). The schools were all located in proximity and situated in a working-class socio-economic environment. The two schools were selected for this research based on their ICT integration and advancement since its implementation.

1.7. Preliminary Chapter division

Chapter 1 Introduction and background

Chapter 1 gives an introduction, the background, the research questions, and the rationale for the study.

Chapter 2 Literature review and Framework

This chapter focuses on the literature of previous studies conducted on ICT integration and the theoretical issues that surround ICT integration as an integral part of SMT leadership role at their schools.

Chapter 3 Research methodology

Chapter 3 presents details on how the research was conducted. It starts with a discussion on the research site and selection of research participants. The research paradigm is addressed, including the research design. Data collection tools, data analysis and ethical consideration are discussed as well.

Chapter 4 Research findings and analysis

This chapter presents a discussion and analysis of the findings of the study.

Chapter 5 Recommendations and conclusions

This chapter presents conclusions to be drawn from the study. It highlights the implications of the study's findings as well as recommendations for any future studies.

1.8. Conclusion

The demand on the 21st century learning environment has increased the urgency on ICT integration in school curricular. Research in the area continues to show a hesitancy in the uptake of ICT in teaching and learning practices. Furthermore, there is a gap in literature on the role of SMTs in facilitating ICT integration. This research will therefore focus in exploring the factors that influences SMTs regarding their role in ICT integration. The next chapter reviews the existing literature on ICT education in South Africa, curriculum reform and implementation and its connections to the School Management Team.

Chapter 2: Literature review

2.1 Introduction

This assessment of the literature was done to examine ICT integration in schools and the difficulties that school administrators, like the School Management Team, experience when trying to influence ICT integration into the curriculum. The role of SMTs will be briefly discussed in the review. The researcher's goal was to examine, using literature and various policies from the South African Department of Education, how school leadership may be effectively utilised in ICT integration at schools. According to Bush (2004), schools need trained staff to manage the school, but they also need good leadership to provide the best education. The term ‘management’ often refers to leadership, especially in a school setting. SMTs should not only possess management attributes but they should also be able to lead all stakeholders in terms of the vision, mission, goals, and objectives of the school (Clarke, 2011).

The Department of Education's top priority is education quality. Quality teaching and learning are the responsibility of school management teams (Molefe, 2013). They should be able to successfully manage their duties and functions to raise the calibre of instruction at their institutions. SMTs must help their instructors instruct their students by sharing their knowledge with them. The SMT's leadership position is essential to ICT integration in every school (Clarke, 2011). The school's management structure, which oversees the regular operations of the institution and implement its policies, is represented

by school management teams (SMTs) (Ndou, 2009. The SMT, oversees putting a plan into action to realize the school community's goal (DoE,2015).

According to the Department of Education (2015), the principal does not work alone in most South African schools and is therefore dependent on the SMT for the execution of policies and the delegation of tasks and/or responsibilities. Therefore, only if each role actor does their part can effective ICT integration take place. ICT education is important in transforming how we study and teach, which transforms schools from the conventional physical structure to a more digital platform.

2.1.1 The role of School Management Teams in Education

The management structure of the school makes of the management team. This organization oversees implementing and disseminating the school's policies (Ndou, 2009). The head of departments, other senior teachers, the deputy principal(s), and the principal of the school make up the SMT (DoE,2015). To the greatest extent possible, the SMT members must support the leader's (often the principal) efforts to implement ICT (DoE, 2015).

SMTs play a crucial role in the schooling system; they are put in management positions to ensure that the school functions and operates effectively to aid teaching and learning. The SMTs functions and duties range from budgeting, coordinating staff duties, organising, leading, implementing policies, disciplining, evaluating, and strategically planning the school’s future (Strydom, 2015). SMTs are expected to take the essential leadership role of influencing teachers at their respective schools (Samson & Julius, 2015). The success of

every school depends on the role of the SMT towards effective educational leadership.

The quality of teaching and learning depends on the competency of members of the SMT. Recent changes in the South African education system have brought challenges to educational managers to improve their ways of managing their members of staff (Samson & Julius, 2015). According to Milondzo (2015) the main challenges that negatively impacted teachers' performances were high failure, rate, lack of resources, curriculum change, lack of discipline and other related challenges (Mulondo, 2015).

SMTs must take the initiative and develop as policy integrators in schools as part of their responsibility. Considering this, Ndou (2009) asserts that the SMT's responsibility is to collaborate on school planning and management (DoE, 2008). These group activities should focus on bettering teaching methods, creating a safe learning environment, and improving learner performance (DoE, 2015; Najjumba et al., 2013). This implies that SMTs are assessed based on the calibre of instruction provided by their institution.

To successfully execute the ICT educational policy outlined in the White Paper 6 on E-Education (2004), a suitable roll out strategy must be created that considers the demands of both teachers and students that are relevant to situations. SMTs must therefore endeavour to realize the objectives of the school's mission, vision, curriculum objectives, and action plans (Ndou, 2009). The school management team is expected to coordinate instructional

strategies that are intended to help students achieve the goals of the new curriculum (DoE, 2015).

School leadership needs to be well equipped on integrating ICT into the curriculum in order to meet 21st century teaching with technology needs (Ndou, 2009). Schools' managers are expected to be more than just administrators, (Botha, 2013), they are required to model behaviour and be at the forefront of implementing measures that impact the way curriculum is integrated with ICT. Furthermore, Ndou (2009) argues that the role of the principal is not only to prepare and support change within the school environment but also to initiate ICT integration (DoE, 2015). Therefore, there is a much greater need for the principal to not only act as manager but also, a strong leader within a school to mobilise the staff to embrace ICT changes.

2.1.2 The role of Information and Communication Technology in Education

Information Communication Technology (ICT) is a broader term for Information Technology (IT) which is used to refer to all modes of communication using technology, including the internet, networks, computers, social networking, and more to exchange information (AIMS publishing, 2020). ICT in education is a mode of education that uses ICT to support, enhance and optimise the delivery of current information (Linways, 2020; Linways Team, 2017).

The National Education Collaboration Trust (NECT, 2018) authored a draft report on the 23rd of August 2018, on the status of ICT adoption into education in South Africa, highlighting various government policy statements regarding

the use of computers in schools. The trust mentions that ICT integration in schools have three sole purposes:

1. ICT being used as a teaching and learning resource tool for its learners and teachers, respectively.
2. Educational management.
3. To coordinate best practices in education (Meyer & Gent, 2018).

The policy dialogue on ICT in Education (2014) highlights that there is progress in school administration and provisions made for teaching and learning but the impact thereof was compromised due to slow and uncoordinated implementation. Furthermore, they state that the differences between schools that were able to implement the various policies and those who were not was the lack of reliable connectivity, leadership of school members, ICT skills of school members and limited learner access to ICTs. These are the major inhibitors of e-readiness at schools despite the government rolling out a national mandate for ICT integration at schools. Schools lack a clear, context-sensitive application of the policy implementation as they put all schools in a one size fits all umbrella, which does not recognise the diversity of the South African school context (Meyer & Gent, 2018).

Meyer & Gent (2018) reveal that despite interventions from various stakeholders and the benefits of integrating ICT in education, the ICT policies set out by the government need to reform all the types of schools found in South Africa. They further state that schools did not have a reliable internet connection let alone enough computers for its staff and learners. The

availability of information and technology plays an important supporting role in bridging the information gap between learners and the world. However, the use of ICT in South Africa remains limited, because of financial shortages, infrastructure, skills gap, and poor internet access. Another concern is the restricted number of trained staff at schools and the unwillingness of staff to be trained in ICT (Adu, 2013).

2.1.3 ICT integration and the curriculum

Information Communication Technology (ICT) is sometimes used as a shorthand for “computer technology,” which refers to the hardware and programs that let users retrieve, store, organise, manipulate, and present information through electronic methods (Adu, 2013).

The inclusion of ICT in the curriculum and provision of these technologies in schools have raised issues of concern to educators, parents, and politicians. The most critical issues are the role of ICT in the curriculum, how these issues should be addressed in the curriculum, and most importantly, how they impact teaching and learning (Ndou, 2009). It has become more important for developing countries, with regards to learning in an online world, to prioritise and include ICT integration in national strategy planning.

The requirement is rendered more urgent by the fact that most daily activities now depend on ICTs in the modern society we live in (Adu, 2013). ICT-savvy persons contribute to societal and economic advancements This is because of their capacity for innovation and efficiency improvement, according to Adu (2013). This suggests that ICT directly affects civilisation. ICT capabilities help

remove historical obstacles that have impeded educational and economic growth, such as isolation and limited access to knowledge sources (Adu, 2013)

ICTs have given educators a way to improve institutional management and policy implementation as well as the design of education (Ogunmakin, 2019). Therefore, ICT adoption is inseparable from the process of curriculum reform and development. It is expected that the findings of this research will be beneficial in terms of acquiring information relevant to ICT implementation in educational institutions.

The term redefining education is the best way to make it clear to educators at all levels, just how much work is required to implement the changes necessary for service delivery in education (Ehlers & Lazenby, 2007). UNESCO (2000) states that:

> “Reorienting education requires teaching and learning, knowledge, skills, perspectives, and values that will guide and motivate people to pursue sustainable livelihoods, to participate in a democratic society, and to live in a sustainable manner. In reorienting education to address sustainability, program developers need to balance looking forward to a more sustainable society with looking back to traditional ecological knowledge” (UNESCO, 2000: p6).

2.1.3.1 Challenges of introducing ICT into the curriculum

ICT integration into the curriculum for schools in underdeveloped nations, especially in Africa, is hampered by several issues. Relevant human resources, a lack of integration rules, language hurdles, information filtering dependability, and plagiarism are a few of these difficulties (Adu, 2013).

ICT integration is more difficult for instructors in modern classrooms since children raised in the "digital era" have unique needs than those of their forebears (Dafoulas & Shokri, 2014). To address this issue, teachers of the new curriculum must receive new training in the use of ICTs to design and build various activities that are tailored to the requirements of students in the 21st century.

Language

Language use is important for integrating ICT into the curriculum. Despite the development of region-specific information methods, only English and French are now spoken (Dafoulas, et. al., 2014). To make it easier for people to use ICTs in the other languages, initiatives are being taken. For instance, China encountered comparable issues with language barriers in ICT, particularly about content and infrastructure (Accascina & Rogora, 2006). By creating Chinese material and enhancing internet connectivity, this was fixed (Adu, 2013). As a result, there was less needed to turn to foreign resources and more emphasis was placed on domestic exchanges (Accascina & Rogora, 2006).

Reliability of Information filters

Users must be able to identify resources that are pertinent, tried, and true, as well as where to access them on the internet due to the abundance of online material and tools (Paas, 2008). To stay up with new technological advancements, social bookmarking tools and new data mining software agents will be employed more frequently. These technologies allow them to find material depending on its calibre and relevancy (Adu, 2013).

ICT plays a crucial role in the learner's ability to creatively learn according to newer models than traditional methods, such as 'chalk and talk' or relying on a textbook only (Fu, 2013). ICT in education provides a range of freedom in curriculum development if implemented correctly and if led in a manner that motivates and improves learning for all involved. It is said that if proper leadership is implemented at schools that are led by instructional and inspirational leaders of the SMT, which could influence teachers, then curriculum delivery and technologies for education or curriculum development would be used (Freeman, 2012).

Furthermore, Telem et al. (1994) suggest a theory for implementation and integration of ICT, comprising of the following components, namely:

Technical: the choice of this framework is based on leadership integrating ICT. When implementing this framework within a school using the top-down approach of ICT integration, we could conclude that schools are provided with

technical expertise by the DoE to provide support and functionality to schools in integrating ICT (Botha, 2013).

Structural: to implement various ICT technologies or to integrate technology fully at schools, the required infrastructure needs to be in alignment with the needs of the school and leadership (Fu, 2013).

Psychosocial: the current state in which schools operate at a specific location affects the leaders' (SMTs) psychological ability to implement ICT (Fu, 2013).

Goals and values: Telem et al. (1994) highlights that the integration of any new ICT should be aligned with the goals and values of the organisation. In the case of this research, Telem et al. (1994) lists steps that will be aligned with the schools' goals and values.

Managerial: focusing on the ability of SMTs at schools to take the lead in the integration and management of ICT.

Throughout the literature, an extensive number of authors highlight factors of ICT integration at schools namely Chang (2016), Botha (2013) and Fu (2013). In this research, ICT will be considered within a South African context, primarily within the Metro East District (Kraaifontein) area, Cape Town, Western Cape.

Stuart's conceptual model (2009) shows the relation among all the different concepts:

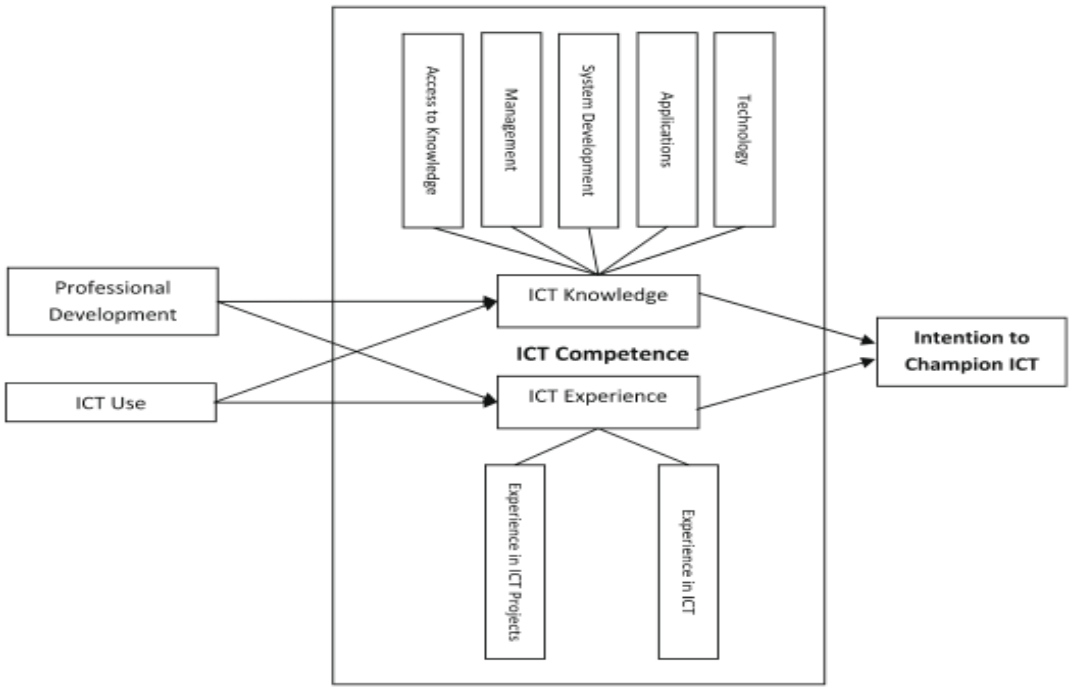

Figure 1: Stuart's conceptual model Computers and Education (Stuart et al., 2009)

ICT knowledge consists of knowledge of technologies, applications, system development, the management of ICT and access to new knowledge regarding ICT (Hennessy, 2010). The link between ICT experience and knowledge, and intention to champion ICT in schools is suggested by researchers in education (Hennessy, 2010, Flanagan & Jacobsen, 2003; Newhouse, 2016). Furthermore, the regular use of ICT by school leaders will encourage other staff to use it and can help the school leader be a more effective champion of ICT. Studies done by Hennessy, (2010); Flanagan & Jacobsen, (2003) &Newhouse, (2016), found that schools lacked the discipline for the new demand's ICT has placed on them.

2.1.4. School management team role in ICT integration in the curriculum

The locus of leadership influences the degree to which ICT integration can become embedded in educational institutions as well as the role of leadership in championing ICT (Hennessy, 2010). To ensure the successful integration of ICT into school curricula, SMTs should:

- be able to make long-term plans with regards to using current and other emerging technology.
- Have the know how to investigate and respond to technology issues, theories, and suggestions
- have a vision of adopting technology into teaching practices
- use technology as a medium for effective communication with colleagues and other stakeholders
- use technology for data collection and analysis to make data informed decisions for school management purposes
- and use technology to communicate and facilitate school events (Fullan, 2003)

Furthermore, Botha (2013) states that technology is a key factor in education and therefore its adoption into the curriculum needs to be a consistent practice. SMTs are required, as a result to adapt their ways of working to accommodate technological changes.

Clarke (2011) mentions that SMTs and principals do not fulfil their roles of management and leadership because, in most situations, the principal acts

based on his or her own perceptions. This is because the SMT does not meet regularly to discuss details pertaining to various integration policies and the strategies that need to be adhered to and/or implemented. Leadership plays a key role in any decision-making in terms of integration processes. The quality of school leadership improves the likelihood of the implementation of ICT measures (Liwane-Mazengwe, 2013).

Education is key to one's growth and development, therefore, schools have a responsibility to integrate ICT into their curriculum especially for teaching and learning to adapt to the age of information evolution. Thus, SMTs and teachers are under considerable pressure to adapt and change strategies for teaching and learning. As a result, SMTs are tasked not only to be competent in "managing" but also need to acquire relevant knowledge in leadership to better equip them to manage schools more efficiently in the 21st century (Liwane-Mazengwe, 2013).

Leithwood, Jantz and Steinbach (1999) highlight the importance of school leadership. They argue that, in most situations, SMTs are not sure whether these positions are of leadership (Leithwood et al., 1999). The way in which a school is led in policy reforms or the way it follows instructions could have various effects on school conditions and the curriculum delivery of the school (DoE, 2015).

Leadership plays a vital role in the implementation of technology in schools. The leadership role played by the SMT is crucial to ICT integration (Clarke, 2011) and the future success of the school. In most South African schools, the

principal does not operate alone and thus depends on the SMT for policy implementation and delegation of tasks and/or responsibilities (DoE, 2015). In the policy on the South African standard for principalship (DoE, 2015), which aims at enhancing the professional image and competencies of school principals, a clear role and description for school leaders are provided. The policy also sets out what is required of the principal (DoE, 2015). Furthermore, the standard in this policy outlines the background against which schools operate in the 21st century; thus, removing the focus from the principal being the only autonomy at the school, viewing the principal as a democratic leader who operates with and through the SMT, the school governing body (SGB) and more (DoE, 2015). For this study, the focus will only be on the SMT for the sole reason that SMTs are the strategic decision-makers and leaders at schools.

The policy for principalship (DoE, 2015:10) highlights that there is a need for principals and their SMTs to keep up to date with the current developments in national education policy and schooling globally (DoE, 2015). Thus, provision needs to be made for SMTs to continuously motivate the upgrading of teachers' knowledge and competency to facilitate change (Liwane-Mazengwe, 2013). SMTs should champion ICT adoption in schools (Yuen et al., 2003).

Studies show a link between ICT, leadership, and integration of technology in curriculum, this could determine the varying levels of ICT integration success (DoE,2015; AlMahdy et. Al., 2018; Dexter & Anderson, 2000; Yuen et. Al., 2003). The DoE is of the notion that the use of ICT in schools and effective school management practices are founded on the decisions, principles,

attitudes, devotion, budgeting, and tactics of the school leader in providing support in ICT integration (DoE,2015; AlMahdy et. Al., 2018; Dexter & Anderson, 2000; Yuen et. Al., 2003). .

A general trend in educational policies worldwide is to foster self-directed learners capable of lifelong learning (Ottestad, 2013). This requires schools to shift from the approach of being knowledge transfer institutions and become learning and adaptive organisations (Ottestad, 2013).

These three perspectives may be complementary, i.e., school leadership is inherently a mixture of features from all perspectives (Ottestad, 2013). The role of the principal as a leader can be demonstrated by the ability to effectively delegate responsibilities and providing role clarity to members of the SMT (Ottestad, 2013). The principal is responsible for pedagogical leadership which can be defined as influential interaction between principal and teacher, the former being the agent of influence (Ottestad, 2013). With regards to ICT integration the leader's responsibility is to enable ICT-related professional development (Ottestad, 2013).

In a previous iteration of the study (Aarseth et al., 2007), four constructs indicating school leadership for ICTs were identified (Ottestad, 2013). The indicators were based on the principals' perceptions of their schools as organisations inclined to use ICT in pedagogical practice (Ottestad, 2013). The findings emphasize that school leadership based on flexibility and digital maturity and promotion of shared practice and assessments with ICT are

features shared by schools that adapted ICT in their pedagogical practice (Ottestad, 2013).

To provide a measure for such pedagogies, such as life-long learning practices in ICT" were identified as an indicator of the preparedness of ICT integration that was indicated in the IEA[1] SITES[2] 2006 study (Law & Chow, 2008; Law & Pilgrim, 2008; Law, et al., 2008). The construct was used to investigate and better understand whether factors existing at school system level would facilitate teacher's innovative use of ICT. Life-long learning orientation comprises items that point to teacher's use of leaner-centred learning methods, if leaners use ICT collaboratively for projects and if ICT was used for effective feedback cycles(Ottestad, 2013).

Additional variables indicated as being crucial for the pedagogical use of ICT. For example, *Teachers' time spent on computers* was split into the following variable: time spent for teaching activities and time spent for lesson preparation and other administrative work (Ottestad, 2013). It is recorded that in the case of Norwegian teachers', an increase has been seen over the last decade for both variables (Berge et al., 2009; Egeberg et al., 2012). However, time spent for administrative purposes continue to dominate over time spent for teaching activities, however the results vary between schools (Ottestad, 2013).

According to Clarke (2007), compared to their predecessors, modern leaders have a greater challenge when it comes to management and learning outcomes. There is a need for a more complex yet flexible approach to leadership. To achieve this, to ensures efficient school operations in the ever changing environment (Botha, 2013). Thus, to become such leaders there is a need to constantly upgrade technical and leadership skills for SMTs so they can better effect changes (Liwane-Mazengwe, 2013).

It is clear from the existing literature that the onus is on the school principal as the school leader, that research needs to focus on SMTs as leaders and their roles as leaders in ICT integration at their schools. According to the DoE (2015), emphasis is placed on the responsibility of SMTs and how they manage ICTs in schools. To help facilitate the integration of ICT in the curriculum, they have provided guidelines on how to implement and rollout ICT into the schools in South Africa (DoE, 2015).

The following themes have surfaced from the literature review: SMTs leadership role of influence for ICT integration in relation to ICT proficiency and managing ICT practice; and the role of SMTs attitudes, beliefs, and morale in ICT integration.

2.1.5. Challenges around ICT integration.

The integration of ICT in schools has changed the norms and standards of how schools operate and as a result more SMTs are required to assume leadership responsibilities (Strydom, 2015). ICT has the potential to transform the curriculum delivery from the conventional teacher led classroom to a more

learner centred learning environment (Bakar & Ismail, 2012). According to the South African policy for school principals (DoE, 2015), the duty of the principals and SMTs is that of technology champions to encourage ICT integration and E-learning. This has, however, left school leaders feeling overwhelmed with the task of integrating ICT (Strydom, 2013). If SMTs are expected to fulfil these roles as ICT leaders at their schools, they will have to play a key role of influence by taking the lead in ICT integration into their own daily practices.

Educational reform in South African schools, puts an increased demand on ICT capabilities for school leaders such as principals, SMTs and teachers to try and develop lifelong competencies (Blignaut et al., 2010). According to (Plomp, 2013; Strydom, 2013) the 21st century skills are essential outcomes for increasing employability in the knowledge society. According to the DoE (2015) school leaders have been tasked with preparing their schools in integrating ICT into their teaching and learning, also to foresee and be initiative-taking in addressing potential future challenges.

Gillwald et al., (2018) writes on the state of ICT in South Africa, they state that the measures required to adopt ICT in schools has become a compounded process. Furthermore, there is extensive research now showing a substantial correlation between ICT, leadership, and school growth (AlMahdy et al., 2018). As with other businesses, technology integration in education has positively impacted on growth leading to economic growth (GDE, 2011). The Department of Education in South Africa (DoE, 2015) believes that the effective

adoption and integration of ICT in schools relies on strong leadership (GDE, 2011).

SMTs are continuously involved in implementing ICT in schools and often find it as a compounded process (Yuen et al., 2003). Findings from studies provide evidence of the relationship between technology, leadership, and technology integration and that this could determine varying levels of ICT integration success (DoE., 2015; Botha., 2013; GDE., 2011; Yen et al., 2003). The DoE (2015) believes that the proper management and use of ICT at schools, is primarily based on the school's leader(s) decisions, commitment, and strategies towards prioritising ICT strategies by providing continuous support and training (WCED, 2019).

Furthermore, Yuen et al., (2003) indicate that in schools with a multiple leadership strategy and the principal can delegate ICT integration responsibilities, work down towards integration can yield positive results (Botha, 2013). Despite the calls for an inclusive approach to technology integration into the curricula, Blewett (2012) points out there are still vast contradictions in the uptake of e-learning in South African Higher Education (SAHE). This is evidenced by the number of studies that show that educators continue to struggle to use technology for innovative instruction design (Blewett,2012). Due to the poor uptake of technology for transformative curriculum design delivery, the use of technology for enhanced learning outcomes remains a grey area (Rambe, 2016; Ivala, 2011). The current study is centred on the question of how ICT is being adopted and used in South

African high schools. A range of publications addressing the provision of ICTs (Ali, 2009; Cossa & Gronje et al., 2006), as well as educator professional development (Lipinge, 2010) have discussed benefits of implementing ICT in schools.

ICT use and benefits, as well as how they can contribute to the digital economy, have been the subject of research (Mireku, 2014). If properly equipped, supported, and motivated, educators can act as change agents in ICT integration. Teachers' professional development influences their knowledge of and proficiency with using ICT as well as their attitudes toward it (Mireku, 2014).

According to published research, ICTs can open new avenues for teaching and learning when used effectively (Lipinge, 2010). This also depends on educators combining technology with innovative teaching techniques to enhance student learning outcomes (Mireku, 2014). In contrast to the conventional teacher-centered techniques, these innovative approaches to teaching and learning are based on cognitive theories of learning, which promote a learner-centered approach (Lipinge, 2014).

The chapter analysed the body of research on ICT adoption in schools and the obstacles preventing its full adoption. The difficulties relate to the SMTs' involvement in ICT integrations and the availability of infrastructure to facilitate integration. Research has demonstrated that ICT use in education is a current issue that must be investigated in the context of coexistence (Mireku, 2014).

2.2. Theoretical Framework

Over the past years, studies of distributed leadership, pedagogical leadership, transformational leadership, integrated leadership, and democratic leadership have contributed to understanding school leadership and student outcomes (Al-Mahdy et al., 2018). However, scholars persistently argue about the merits and demerits of adopting each of these approaches in framing exploration showing the link between principal leadership and student outcomes. Although Hallinger and Murphy (1995) contend that pedagogical leadership represents one of the key functions of school principals. Day and Dragoni (2015) and Jo et al. (2015), agree that, due to variations in context, a combination of approaches is best used to study school leadership. This study, therefore, incorporated three different theoretical perspectives namely: distributed, pedagogic, and transformational leadership to explore the role of school leadership in influencing the ICT integration process and affect the level at which ICT integration is implemented and supported (Day and Sammons, 2013) in rural schools. The study specifically examined the applicability of these different perspectives for ICT integration into pedagogy. The main aim was to establish how these leadership models are likely to influence the leadership practices with regards to integration of ICT within their schools. Harris et al. (2014) concludes in their studies on:

"*Leadership, perceptions and technological integration*" the practices of school leadership must be aligned to theoretical models and that leadership should be

built as a mutual influence whereby school leaders influence others and vice versa to integrate ICTs into instruction.

Scholars, (Hallinger, 2018), view strong leadership as a framing factor of greater significance in ICTs use in education than funding or equipment levels. Similarly, Harris et al. (2014), Ottestad (2013) and Day and Sammons (2013) support the need for an integrative model of educational leadership linking principal leadership to the ICT integration needs of the school context. Figure 4 shows the use of different theories of leadership, which included the distributed, pedagogical, and transformational leadership perspectives for ICT integration that was used in the present study. The illustration shows the complementary role played by the three theoretical perspectives on leadership for ICT integration.

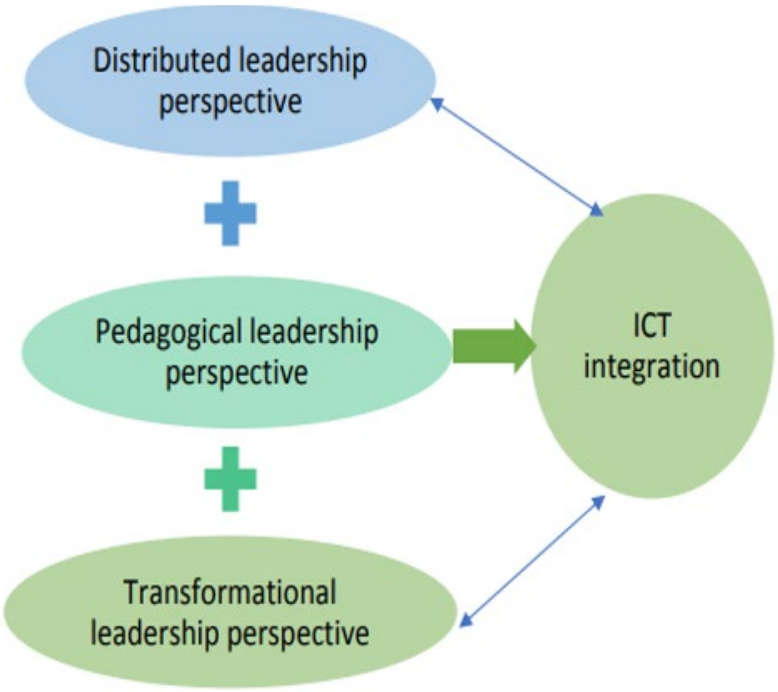

Figure 2: Theoretical Framework diagram adapted from Day and Sammons (2013)

It is important to highlight that the three different leadership perspectives underpinning the study are not mutually exclusive, but each one is widely accepted as a fitting model to use in exploring school principals' roles as ICT leaders (Day et al., 2014; Ottestad, 2013). The perspectives build on studies of school improvement that point to the key role of leadership in ICT integration (Spillane et al., 2015). The different perspectives are used throughout the analysis and interpretation of data in the present study and are briefly discussed in the coming sections.

2.2.1 Distributed leadership

A clear understanding of the distributed perspective in the present study is based on the distributed leadership studies by scholars who include Spillane, Halverson, and Diamond (2004), Spillane, Diamond, and Jita (2003) and Printy (2014). They recognise that leadership perspectives are critical in implementing reforms in schools. The concept of distributed perspective is best comprehended as a practice widely distributed among principal leaders, followers, and their situations (Spillane *et al.*, 2004; Spillane and Healey, 2010). The model is hinged on the practice of leadership and not necessarily who executes the responsibility for leadership roles or routines. Taking a distributed perspective encompasses two aspects, which are the *leader-plus* and the *practice aspect* (Spillane *et al.,* 2003; Spillane *et al.,* 2004). The leader-plus concept acknowledges that managing and leading institutions involves multiple individuals who include other key members in formally designated posts such as assistant principals, teacher mentors, subject specialists, or technical

experts, in addition to principals. Harris *et al.* (2014) asserts that an exclusive focus on school principals is simply limiting since other formally designated school leaders play pivotal roles in managing and leading implementation of school's reforms. It was therefore anticipated that, taking a distributed perspective together with other perspectives such as pedagogical and transformational leadership in implementing the ICT policy in South African schools would allow the teachers without formal leadership positions to be responsible for collectively and collaboratively implementing ICT policies.

The rationale behind using this theory is to enable all staff members to complement each other's efforts and expertise in leading the ICT integration process within classes without necessarily assuming that all the members should be leaders. On the other hand, the *practice* aspect foregrounds the practice of leading ICT integration by enabling expert teachers to complement collaboratively, the roles of principals without solely relying on individual leaders because actions of principals alone are viewed as inadequate. The practice of leadership is seen as central while principal leadership roles, functions and school structures are also valued.

In the present study, taking a distributed perspective implied that all staff members, whether principals, assistant principals, teacher mentors, ICT technical experts or heads of departments would be able to operate in and out of the school administration executing leadership functions as determined by the nature of work, need or school context. Thus, framing ICT leadership from a distributed perspective foregrounds the formal and informal aspects of the

school and relationships within the system without discarding school principals' designation. The major issue is uncovering how leadership practices should be distributed among leaders in support of ICT infusion into lessons. Spillane and Orlina (2005) suggest the use of collaborated distribution where leadership is stretched over the work of two or more leaders in place and time especially when coaching novice teachers in implementing new reforms. Collective distribution where leadership practice is stretched over two or more leaders executing leadership activities separately but interpedently is also suggested (Spillane et al., 2003)

On the other hand; Spillane et al. *(*2004) propose the use of coordinated distribution whereby leadership routines have more than two activities which should be performed sequentially by means of co-performance and interdependency.

Principals enact their roles as influential leaders to the management teams , with the duty of creating a culture of trust and mutual learning (Spillane et al*.,* 2015). Such a culture supports the distribution and delegation of leadership responsibilities for ICT use. This view was a useful guide in the current study into how school leaders and teachers, can work collaboratively towards teaching with and through ICTs.

2.2.2. Transformational leadership

Transformational leadership is an effective perspective to explore ICT reform processes. Leithwood (2010) states that this perspective is based on four unique but interconnected behavioural elements that include inspirational

motivation, intellectual stimulation, idealised influence, and individualised consideration. The literature shows that principals who demonstrate transformational leadership have the capacity to influence and reshape teacher values, beliefs, and perspectives in favour of developing ICT pedagogical practices (Leithwood *et al.,* 2010). According to Harris and Jones (2015) a leader's charisma and authority can inspire the educators to work towards meeting the schools' objectives. Applying the transformational leadership perspective to complement pedagogical and distributed leadership was deemed necessary due to the complementary role that each of these leadership theories play in analysing and understanding principal leadership and student performance within schools. The different theoretical perspectives enabled the researcher to maximise on the merits of each leadership style and cater for the weaknesses of each of these different models when applied by school leadership in ICT integration.

2.2.3. Pedagogical leadership

According to the pedagogical leadership viewpoint (Hallinger and Murphy, 1985), principles must be completely applied while monitoring, counselling, and influencing educators' professional development for integrating ICT (Hallinger et al., 2014). This perspective, according to Mishra and Koehler (2006) and Harris and Jones (2015), is helpful in the growth of teachers' technology pedagogical topic understanding (TPACK).

To implement effective instructional and evaluation practices, school administrators must integrate the institution's vision, direction, and goals with

the model. Based on this viewpoint, principals' ICT knowledge and abilities can be leveraged to guarantee that the integration of ICTs produces the required results (Day, 2013). According to Harris and Jones (2015), distributed or transformative leadership are less effective than educational leadership. It is significant to note that all the analysis processes for the study used one of these three leadership viewpoints.

2.3. Summary

Principals, SMT and school stakeholders such as teachers, community and parents have different beliefs and attitudes towards ICT integration (Botha, 2013). This is true for SMT members as well, whose perceptions help to inform their knowledge about ICT integration and how they integrate it at their schools. Therefore, the question comes up on how their perceptions impact on the ICT integration at their school thus within the context of their naturalistic states this study will attempt to understand their natural leadership role, their beliefs, attitudes, perceptions, and challenges of ICT integration. Although ICT integration has revolutionised the endless possibilities into the curriculum, it has also placed various challenges on SMTs. The integration and practice of ICT affects the school on all levels and SMTs are often at the centre of all changes in schools (Botha, 2013). Therefore, they play a crucial role in determining the extent to which ICT is integrated at schools. Thus, we can deduct from the literature that SMTs do not function as individuals but as a unit of leadership in ICT integration and innovation into the curriculum.

Chapter 3: Research design and Methodology

3.1 Introduction

This chapter presents the research designs used for in this research. It provides an explanation of research approaches used as well as the methods and tools used for data collect and data analysis.

A research design is defined as a plan or map that guides how the researcher will conduct the research (Cohen et al., 2018). The objective of this study was to rollout the research in such a way that the validity of the research findings could be maximised to the overall purpose of this study (Mouton, 2001).

Maree (2010) presents six types of qualitative research designs that are popular in research design literature. These are conceptual studies, historical research, action research, case study research, ethnography, and grounded theory. Maree (2010) goes on to state that qualitative methods of research can be either interactive or non-interactive studies. In this study the researcher made use on an interactive approach in the form of a case study whereby a single entity (SMTs) were researched. This study made use of a case study with the aim to explore and examine the role of SMTs in ICT integration.

3.2 Research paradigm

According to Cohen et al., (2018), a paradigm is how the researcher sees the world, it is their way of thinking which helps them to make sense of the world and take meaning from social interactions. Johnson and Christensen (2014) define a paradigm as a theory that is based on one's perspective, the

perspective itself being a result of shared beliefs, values and behaviours. In other words, a paradigm guides the researcher's thinking in the quest for knowledge. The researcher builds the plan and activities of the study based on this thinking, this includes the methods and tools used to collect and analyse data.

This study employs an interpretive paradigm which approaches reality as not being singular but rather, made up of intertwined dimensions that are context specific (Maree, 2010). Furthermore, Kuhn (1970), in De Vos in De Vos et al., (2005) refers to the paradigm to the paradigm as how the researcher sees their material. The paradigm is one that understands data more from subjective experiences as compared to measures (Kuhn,1970). Therefore, this study sought to explore the human experience of SMTs.

A paradigm is further seen as a building block of science (De Vos in De Vos et al., 2005). A paradigmatic view is when the researcher makes and settles on certain assumptions as a basis of their understanding of the world (Maree, 2010). According to Mouton (1996) a paradigm explains the problem area for the researcher, thereby informing what aspects need to be studied at the same time working as guide towards a solution to the problem.

A qualitative phenomenological methodology was used in this study within the interpretive paradigm. To understand the SMT experiences in great depth, a qualitative technique was selected. It is claimed that a qualitative approach is helpful for comprehending human behavior and the factors that influence it (Johnson & Christensen, 2014). The research adheres to the postmodernist

tenet that reality is socially created (Neuman, 2011). Their first-hand experiences and created realities were examined to better understand the function of the SMT in incorporating ICT.

3.3. Research design and methodology

The role of SMT in ICT integration was examined in the research study. The study design and methods used to address the research questions are described in this chapter. The methodologies utilized in this study were defined in many ways and justified in many ways. ethical and dependability issues that were considered in this investigation.

A research design is a plan for arranging the investigation to support the responses to the questions being investigated (Cohen, et. al.,2018). According to Labaree (2013), a research design is the entire plan you use to make sure you successfully solve the research challenge. To investigate the perceived role of SMTs in ICT integration into their curriculum at their schools, this study adopted a qualitative methodology. A qualitative technique is employed, in accordance with Cohen et al. (2018), when you want to understand the lived experiences of the participants in your study better.

Furthermore, a qualitative technique is described as producing a rich description of the subject under study by Rubin and Babbie (1989) and Chigona (2014). Consequently, qualitative research examines the world in its natural state (Tunjera, 2019). Due to the depth of the investigation, qualitative research approaches fit the interpretivist worldview (Cohen, et. al., 2018). Since the study's goal was to analyse how SMTs integrated ICT, it was necessary to

thoroughly examine both the SMTs' collective role and their individual viewpoints. Despite taking a qualitative approach, it enabled the research to learn more about how SMTs use ICT in their daily lives. Additionally, methods, social context, and participant opinions of their world are all important to qualitative research (Creswell, 1998:15: Tunjera, 2019).

Cohen et. al., (2019) argues that qualitative approach uses an inductive reasoning approach, meaning that it regards participants as beings who construct their own meanings of situations and act it through interpretations. Hammerseley (2007) disagrees with qualitative approach reasoning, by stating that qualitative findings are not easy to categorise due to a lack of statistical data analysis. However, the emphasis of this study was to analyse the specific contexts in which participants were in, therefore the main concerns could not be statistically analysed but used data to draw comparisons. An interpretive paradigm helped gain an in-depth understanding of the phenomenon (Scotland, 2012).

Qualitative research methodology approach was suitable for this study as it aimed at investigating the phenomenon of this study in its naturalistic setting and challenges SMTs face when integrating ICT at their respective schools.

The next section further discusses the methods employed in this study.

3.3.1. Sampling

Sampling is the process used to select research participants (MacMillan & Schumacher, 2010). According to MacMillan and Schumacher (2010) sampling

is the process of the researcher follows in selecting the participants from a larger group of people. The type of sampling used was that of purposive sampling as it is considered the most important type of non-probability sampling (Maree, 2010). According to Maree (2010), purposive sampling is when participants are selected by virtue of being holders of first-hand information on the phenomenon under study. The researcher chose this type of sampling because it relies on personal lived experiences. This was crucial for the researcher to deliberately obtain units of analysis that would be representative of the relevant population (Welman et al., 2005). The participants selected for this study were all members of the SMT. The objective was to have participants representative of the population, which in this case was stakeholders in the school.

The researcher generated a purposive sample of SMTs across all disciplines from the selected schools in Kraaifontein which is situated in the Metro East Education District. The sample did not naturally permit generalisations outside the group of sample elements which belies the intent of the study (Padayachee, 2017).

A convenience sampling method was followed, due to the proximity of the schools located in the Metro East schooling district in Cape Town. Due to the study being primarily focused on School Management Teams ICT integration at their schools, purposive sampling method was the most suitable to be applied. Purposive sampling can be defined as the non-probability sampling

used in qualitative research for the identification and selection of information rich cases related to the study.

With the help of purposeful sampling, the researcher can investigate current happenings in a specific scenario (Cohen et al, 2011). In addition, a general SMT is composed of a principal, one or more deputy principals, depending on the size of the school, and heads of departments, according to the South African policy of principalship (2015). The Head of Departments (HoDs) who made up the school management team at each chosen school, as well as the principal, deputy principal,, were therefore the participants chosen for the study (see Chang [2016]; Botha [2013] & Fu [2013]). Five SMT members from Schools A and B were selected by purposive sampling.

3.3.2. Site Selection

The site for the study was focused on high schools in the Metro East Education District, narrowing it down to the Kraaifontein-Cape Flats area where the researchers' interests in the SMTs leadership role in ICT integration first arose. Since the researcher works in the Kraaifontein school district, schools were chosen within an approximate distance of no more than 2 km from each other. This helped to give a better overview on what was happening in ICT integration in that specific region.

Two schools were chosen based on three reasons; the researcher is a Practitioner at one of the schools which made it easier to reach out to participants, the availability of the SMTs at the specific school and the location of the schools which was an added convenience to the researcher as well.

Furthermore, these schools share the same ethos, geographic, economic, and social background.

3.3.3. Data collection methods

The following methods of data collection were used for this study:

3.3.3.1 Interviews

Semi-structured interviews were the main method for gathering data in this study. In his 2013 article, Harding lists adaptation and flexibility as benefits of interviews. Additionally, they give the researcher a chance to pose challenging queries to gain a deeper comprehension of the topic being studied. The researcher found that this was helpful in achieving the goal of a thorough investigation of SMTs' function in ICT integration, and when necessary, the researcher was able to ask follow-up questions.

Additionally, during the interview sessions, a discussion guide was used to steer the conversation. According to Mathews and Ross (2010), an interview guide can be a helpful tool for giving an interview structure while yet allowing for the exploration of additional material. It merely helps the researcher stay focused on the field of inquiry. Interviews were held in-person, over Skype, or even over WhatsApp calls, depending on the availability of the SMTs at the various schools. Based on the availability of SMT members, all interviews were planned on a given day and time.

To ascertain their opinions about their leadership roles in the integration of ICT into the curriculum, interviews were conducted with each of the five SMT members from schools A and B, for a total of ten participants. Participants have

the option to express their opinions in their own words during semi-structured interviews, which can also yield trustworthy, comparable qualitative data (Cohen et al., 2018). Open-ended interview questions let participants express themselves whatever they wanted. Open-ended questions are frequently used by qualitative researchers because they enable participants to express their opinions (Creswell, 2003:10). The duration of the above field work took one month. The data analysis commenced early in the data collection process, to reduce the problem of data overload, as cautioned by Cohen et al. (2018).

3.3.3.2 Focus-group interviews

Participants (SMTs) from the two schools were interviewed in focus groups to better understand their perceptions of their individual responsibilities in the integration of ICT.

According to Dilshad et al. (2013), a focus group enables a group of people who have experienced the same occurrence to reflect on their experiences in response to the interviewer's questions. Focus groups, therefore, provided an interactive environment for the SMT members as it allowed SMT members share and compare experiences on integration at their schools.

The focus group discussions took place after the individual interviews so as not to influence the participants' individual views before the time. The focus group questions were open ended and that allowed participants to give detailed feedback and the researcher stayed neutral to the discussion by simply asking questions for clarity. According to Bernard and Ryan (2010), open – ended questions allowed people to relay their experiences in their own words. Since

the researcher communicated directly with the participants, they had the opportunity to ask for clarity on research questions and the researcher could do the same on regarding participant responses (Stewart & Shamdasani 1990 in Welman et al., 2005).Throughout the discussions the researcher took notes and wrote those up afterwards in the form of a journal.

Some of the interviews were audio recorded with consent granted before the interview. For the participants that objected to being recorded, written notes were taken down in form and were kept in the form of a journal. .

The researcher compiled questions in advance, but other questions emerged from the site. Focus group interviews were used because of the cost effective and time saving attributes. According to Welman et al. (2005) focus group interviews are an effective way to acquire information rapidly with a reduced burden of cost. Krueger and Casey in Greeff in De Vos et al. (2005) mentioned that the purpose of the focus group is to promote self-disclosure among the participants. A particular advantage of focus group interviews was that of in-depth discussion on the phenomenon of interest, giving the researcher better insight.

3.3.4. Data analysis

The data analysis process that was used for this study was based on the theory of Adu (2019) used for analysing qualitative data. Data analysis is done so that one can give meaning to data (Adu,2019). The responses from participants were coded, analysed, and categorised into various themes as these emerged from the analysis, by using the NVivo software. The transcribed text data was

initially organized into categories, named ‘free nodes,’ which allow for ease of review according to identified patterns (NVivo-9, 2010). Then the ‘free nodes’ were re-grouped into ‘sets’ that were code-named to get sub-themes. These sets were reviewed and further refined by merging closely related sets in terms of data categories, which eliminates overlaps in codes (Mwawasi, 2015). Finally, themes were built out of these sub-themes to provide a deeper understanding and make meaning of the data collected, for later discussion of these findings by the researcher (NVivo-9, 2010). The researcher then applied (Adu,2019) analysis tools and steps to guide the ontological perspective of data coding by making use of Professor Adu’s (2019) detailed step by step guide through encoding, deciphering, and decoding the current data at hand. The guide is detailed below.

Identifying the features of quality Data analysis:

- Establishing meaning of coding.
- Developing coding strategies.
- Determining the appropriate coding steps and
- What are the required steps for coding that are relevant for the current study.
- Memo (documenting data).
- Categorising coding strategies.
- Finally, determining the relevant implementation of strategies to categorise the data (findings).

These steps were followed diligently to sort, encode, and decode data for analysis, respectively.

The nature of qualitative research allows for a researcher to come to a unique interpretation of phenomena, the findings cannot be generalized,(Buckley et. al., 2014). Simons (2009:117) views interpretation as a:

High-level cognitive and intuitive process that frequently requires complete absorption in the data. The heart of the investigation's objective can be inferred from how study findings are interpreted, claim Leedy and Ormrod (2010). They advise that to interpret the data holistically, researchers should completely engage with it from all angles.

In the data analysis process, developing codes and categories offers a method of interpreting the data in a way that is approachable and representative of the social environment in which it has been gathered (Maree 2010). Maree (2010) advises the researcher to make note of any patterns and themes that emerge during the interpretive process. According to Stringer (2007), a researcher should be open to many interpretations of events as held by various people while employing an interpretive perspective. Denzin (1994) and according to Simons (2009), data can only be understood when the researcher has analysed and interpreted it using a data reduction method. Data reduction, according to Simons (2009), is the process of choosing, concentrating, and abstracting valuable information from the raw data gathered. The researcher should keep an eye out for metaphors and puzzles that are given in the data, the author further recommends.

To analyse the data for this research and reach relevant conclusions, Leedy and Ormrod (2010) note that it is crucial for the researcher to tell the truth. According to Simons (2009), the following issues prevent case study analysis and interpretation from being widely discussed in literature:

- they are heavily depended on the researchers' interpretive skills, and these are not standard amongst researchers
- due to the subjectivity of interpretation the, it is difficult to set replicable guidelines for analysis
- it can be time consuming to attempt to formulate ways of analysis

Furthermore, Adu (2019) suggests taking each sentence of response to the questions in the research and giving it a name that presents the research question or sub-questions, Cohen et al., (2018), Creswell (2009) and Devos (2003) also supported this. Handwritten notes were used as a method to recall the research interviews and discussions. As well as recordings of participants who allowed the interviews to be digitally voice recorded. All this was done to record the thoughts and responses about the initial themes (Adu, 2019). Adu (2019) refers to this process as memoing, which is the process of taking down reflective notes and comments on the data for better understanding. After reading all the data and listening to the digital voice recordings of participants, a list of themes emerged from it that will later be categorised according to its purpose.

These codes were used to determine the various categories applicable to this research and were named to align with the objective of the research questions

and sub-questions (Botha, 2013). Categories are of utmost importance in research and are used as a reference and abbreviated into various stepping stones (Evans, 2002) for developing theory. Handwritten coding (Creswell, 2009) was used to code into transcripts. The coding process involves breaking down the data, conceptualising it and then putting it back together in new ways which makes the analysis of the data more systematic (De Vos, 2002; Botha, 2013; Adu, 2019).

The researcher furthermore looked at patterns and trends between the various themes (Adu, 2019). The last step of the data analysis process was to review the data against theory and relevant literature (Creswell, 2009). Adu (2019) suggested that the use of direct quotations of interviewee responses ensures the authenticity of the information that has also been applied to this study. In the latter discussions on the findings and analysis of the data, the SMT members were referred to as variables such as SMT member A of school A to ensure the anonymity but all the confidentiality of all members that took part in this study.

3.3.4. Trustworthiness

The triangulation of the data from the two data sources ensured reliability. According to Cohen et al. (2018), triangulation is a useful strategy for validating the validity of data. Furthermore, one can develop credibility through:

“Honesty, depth, richness, and scope of the data achieved, participants addressed, amount of triangulation and researcher's indifference or objectivity” (Cohen et al., 2018: 158).

Johnson & Turner, (2003) as also cited in Maree, (2010) states that it provides the viewer with the assurance that the study's findings can be believed and are of outstanding quality. This section explains the many techniques utilized to assure the reliability of this study's findings.

De Vault (2019) states that data trustworthiness in qualitative research has four key components namely:

1. Credibility: This is established by means of having member checks to confirm that the data was correctly captured (Lincoln & Guba, 1985; Nowell et. al., 2010). Lincoln and Guba (1985) suggested activities such as prolonged engagement and observations as well as data collection and researcher triangulation. They also recommended peer checks on the research process, valuable feedback here improves credibility (Lincoln & Guba, 1985). In this study credibility was achieved by having all collected data verified against notes and voice recordings.
2. Transferability: The research can be applied in other similar school contexts. When readers can examine the research process, they are better able to judge the dependability of the research (Lincoln & Guba, 1985; Nowell et. al., 2010). One way that a research study may demonstrate dependability is for its process to be audited (DeVault, 2019).
3. Dependability: To achieve dependability, researchers can ensure the research process is logical, traceable, and clearly documented (DeVault, 2019). When readers can examine the research process, they are better able to judge the dependability of the research (Lincoln & Guba, 1985;

Nowell et. al., 2010). In this study, this was achieved by setting exact dates for interviewees and allowing them the freedom of being interviewed separately before engaging into the focus group discussions.

4. Comfirmability: Confirmability is concerned with ensuring that findings and interpretations are strictly based on the data, requiring the researcher to clearly show how conclusions and interpretations have been reached (DeVault, 2019). According to Guba and Lincoln (1989), confirmability is established when credibility, transferability, and dependability are all achieved. Koch (1994) recommended researchers include markers such as the reasons for theoretical, methodological, and analytical choices throughout the entire study, so that others can understand how and why decisions were made.

3.3.5. Credibility and verification

To ensure credibility and verification the researcher employed the process of cross-checking field conclusions made against field notes consistently. The research participants were contacted to check on the clarity of the data collected, and conclusions made. The conclusions were also compared with the findings from other studies as reflected in the literature review.

3.3.6. Transferability

Transferability in this study was attained by giving the reader enough information to determine whether the research findings apply to their scenario. This transferability strategy is also advised by Lincoln and Guba (1985), who

claim that it is up to the reader to draw their own conclusions rather than relying on the researcher to present a transferability paradigm.

3.3.7 Ethical Considerations

Creswell (2014) argues that researchers ought to preserve the dignity, needs, values and desires of participants. Therefore, Names of the participants and the schools were not used to protect their identities. Before research was conducted, ethical clearance was obtained from the institutions, namely the Cape Peninsula University of Technology (CPUT), the Western Cape Education Department (WCED) and the two high schools, all participants agreed to participate as participation was voluntary. Participants were made aware of how the study would be conducted and the importance of their input to the research.

As an insider in the organisation, the researcher used specific mechanisms to counter any biases, such as triangulation of data, member validation and validation meetings as mentioned above. Research data was collected without prejudice.

Informed consent and Full disclosure

The researcher acquired permission from the provincial education department, relevant school principals, the district office, SMTs, as well as from all participants to do research at the schools (See the attached appendixes A&B for the letters of approval). According to McMillan and Schumacher (2010) informed consent implies that the research participants have a choice about

whether to participate or not and this is achieved by providing research participants with an explanation of the intended research.

The researcher informed participants that they could, at any time, pull out of the research. Participants had to give a written consent to participate. Johnson and Christensen (2008), in McMillan and Schumacher (2010) lists information that can be included in a consent form. This includes, purpose and duration of study, potential risks, research benefits and others. This way the researcher also practised full disclosure with the participants. There was transparency and the participants were not manipulated to stay in the study. .

Anonymity

According to Strydom in De Vos et al. (2005), the concept of personal security is implied by the concept of privacy. Only the researcher has access to participant profiles, replies, behavior, and other data, claim McMillan and Schumacher (2010). To safeguard their real names, the participants were assigned pseudonyms. No research participant can be identified based on the results presented thanks to anonymity (Babie 1990, Baker 1988, in De Vos et al. 2005). Confidentiality: In this regard, the researcher made sure that the data and responses from the participants remained private. In this study, the scribe who helped the researcher take notes was also involved in the approval of the participants.

Actions and competence of researcher

The researcher regarded herself as competent and skilled enough to conduct the investigation and ensured that the project ran its course in an ethically acceptable manner. With regards to sources of information, the researcher made every effort to ensure that others' work was referenced and acknowledged (McMillan & Schumacher, 2010).

3.3.5 Summary

This chapter has detailed the methods used in data collection and analysis for this study. It has also addressed the paradigm used to direct the data collection process. The following chapter will present the research findings.

Chapter 4: Findings

4.1 Introduction

This section aims to discuss the findings from the analysis of the interviews (semi-structured and focused group discussions) that were conducted. The main reasoning behind the research methods employed in this study, were to explore SMT members' roles in ICT integration into their curriculum at schools. Furthermore, the researcher sought to understand the knowledge, attitude, and practice of the SMTs towards ICT integration. Therefore, group discussions were used to get an overall overview of the SMTs to explore the way they perceive their various roles of leadership with relevance to ICT. This gave insight on the challenges SMTs encounter when integrating ICT at their schools. The section that follows shows the findings of the research, the findings are presented in the following themes (categories) which emerged from coding the data:

1. SMTs leadership roles in ICT integration into their curriculum delivery at schools.
2. The knowledge, attitude, vision, and practice of the SMTs towards ICT integration.
3. SMTs perceptions about ICT integration practices at schools.

4.2 Report on data capturing

It is especially important to highlight that all interviews and focus group discussions were done under strict regulations. With the closures and

reopening of schools at various times this had an enormous impact on how the interviews were conducted. For the focus group discussions, SMT member participants at school A and B chose to do a WhatsApp group call and the researcher made verbatim handwritten notes during the discussions as a reference because all participants did not agree to voice being recorded. However, SMT members agreed to being voice recorded for future reference. All interviews and focus group discussions were documented through handwritten verbatim as reference. Initially, the interviews were scheduled for July/August 2020 but due to various external factors such as government regulations and restrictions were in place, they could only take place during September 2020, once regulations had been softened.

Timeline of interviews and scheduling.

1. Months of July and August were used to send out and get permission from the various schools.
2. During the month of August principals of schools gave permission to conduct research.
3. Thereafter, during August 2020 SMT members of the school were approached to partake in the research; reasons for the study were given; as well as permission from the SMTS.
4. After all permissions were granted various dates in September were identified for interviews and focus group discussions to take place either directly at their schools or via voice call due to them being in isolation.

Table 1: School A: interview dates: Participants 1-5. At school A, various participants did not agree to voice recordings during their interviews. Therefore, only verbatim handwritten notes were used at school A.

Table 1: School an Interview schedules

Week 1 and 2 of interviews (school A)	2 Sept. 2020 Individual interviews with principal and deputy principal. In person at the school at 3pm.	3 Sept 2020 Individual interview with two HODs. In person at the school at 3pm.	4 Sept. 2020 Individual interviews with Subject Head. In person at the school at 3pm.	7th Sept. Focus group discussion via WhatsApp at 3pm.

Table 2: School B interview dates: Participants 5-10. At school B various participants agreed to voice recordings during their interviews. Therefore, a combination of voice recordings and verbatim handwritten notes were used at school B. School B had a total of six participants in total.

Table 2: School B: Interview schedule

Week 2 and 3 of interviews (school B)	9 Sept 2020 Individual interviews with principal and HOD. In person at the school at 10:26 am and 10:45am.	10 Sept. 2020 Individual interview with the deputy principal and Math subject head. In person at the school at 6:15am and 6:30 am accordingly. and Individual interviews with English Subject Head at 13:00pm.	10 Sept Individual interview with HOD at 15:00pm. Thereafter, 15:15pm interview with an HOD.

Interview data and focus-group discussions

Using a combination of techniques, the researcher ought to seek and analyse data critically to identify various themes and codes within the data. The researcher used step by step procedure to analyse and interpret data. A combination of memoing, handwritten notes and verbatim was used to sort and further analyse data using the Microsoft word application. The analysis are as follows:

4.3 Data Analysis and findings

4.3.1 SMTs leadership roles in ICT integration into their curriculum at schools.

The following findings focused on identifying common themes of leadership in ICT integration and practices. Over the past years, studies of distributed leadership, pedagogical leadership (teaching and learning), transformational leadership, integrated leadership, and democratic leadership have also contributed to an understanding of school leadership and student outcomes (AlMahdy et al., 2018).

This study sought to investigate roles of SMT members in ICT integration. It also investigated the SMTs perception of their leadership role Furthermore, the role of SMTs has been categorised according to two main categories namely:

1. Type of leadership style used in ICT integration.
2. Belief systems by SMT about ICT usage in the curriculum for teaching and learning.

4.3.2 Leadership role in ICT integration

4.3.2.1 Distributive leadership style

The findings of the research suggest that distributed leadership style was prevalent. This is evident by the mention of Principal B from school B that said:

"As the principal of the school it is very important for me to communicate and lead by example especially in conjunction with those SMT members in all decision making."

They recognise that leadership perspectives are critical in implementing reforms in schools. The concept of distributed perspective is best described as a practice widely distributed among principal leaders, followers, and their situations (Spillane *et al.*, 2004; Spillane and Healey, 2010). This finding reflects the findings of the previous study done by DoE (2015) that SMT plays a crucial role. Therefore, it focuses on the practice of leadership and not necessarily who executes the responsibility for leadership roles or routines. Taking a distributed perspective encompasses two aspects, which are the *leader-plus* and the *practice aspect* (Spillane *et al.,* 2003; Spillane *et al.,* 2004). The leader-plus concept acknowledges that managing and leading institutions involves multiple individuals who include other key members in formally designated posts such as assistant principals, teacher mentors, subject specialists, or technical experts, in addition to principals. Harris *et al.* (2014) asserts that an exclusive focus on school principals is simply limiting since other formally designated school leaders play pivotal roles in managing and

leading implementation of school's reforms. It is therefore during the semi-structured interviews and focus group discussions that SMT member participants expressed their views of leadership, consequently each SMT member feeling that as a "team" the SMT can effectively integrate ICT.

In the present study, taking a distributed perspective implied that all staff members, whether principals, assistant principals, teacher mentors, ICT technical experts or heads of departments, would be able to operate in and out of the school administration executing leadership functions as determined by the nature of work, need or school context (Afshari, et al., 2008). Thus, framing ICT leadership from a distributed perspective foregrounds the formal and informal aspects of the school and relationships within the system without discarding school principals' designation. Collective distribution where leadership practice is stretched over two or more leaders executing leadership activities separately but interdependently is also suggested (Spillane *et al*., 2003).

4.3.2.2 Transformational leadership style

ICT reforms' associated change processes can be examined from the perspective of transformational leadership. According to Leithwood (2010), transformational leadership is made up of four distinct but related behavioural components, including idealized influence, inspirational motivation, intellectual stimulation, and individualized concern. According to the research, principals that exhibit transformational leadership can reorient teachers' values,

convictions, and views to create great ICT pedagogical practices (Leithwood et al., 2010). The HoD B from School B further explained:

"When it comes to change in the curriculum, we function as a team by providing support and training to all stakeholders."

The findings indicate that the principal usually acts a role model for his SMT staff by stating that *(principal A school A):*

"As a principal of a school on a daily basis I am expected to naturally lead by example as many of my staff, teachers and learners depends on me to make an impact on the way the schools is run; I believe that if all principals enforce ICT into their schools daily practices it will automatically water down to how teaching and learning should be done however most of my roles at the school are delegated to my SMT members to help me achieve what is entirely needed for the school."

Thus, transformational leaders such as principals could not only influence SMT and staff but also inspire and motivate SMT members by creating an atmosphere of equal importance.

4.3.2.3 Pedagogical leadership style

As identified previously in literature that pedagogical leadership style, that stresses the importance of continuing observations, evaluation, and development to improve outcome at school. Various participants during the interviews identified that through ICT integration for teaching and learning, they

can better equip themselves for the future of delivering curriculum through continuous training and development. They expressed their views respectively:

“I would like us to integrate it as a school, as most teachers do not use it in their teaching and learning practices, as they do not yet feel comfortable with using the technology. However, because my department deals with a variety of technology, it is so especially important that teachers equip themselves now especially as changes are coming. Curriculum has digitised as most things, taught online as well. ”

“Feel that we play a duty of responsibility role as we often divide our role in ICT between departmental heads”

“Recommending training and to use it in teaching and learning.”

It became prevalent that SMT members roles and practices toward ICT integration and leadership style comments of SMT members role of their leadership traits, characteristics, abilities, and tasks about the issue of effective leadership and ICT practices were quite positive.

4.3.3 The attitude, knowledge, and perceptions of the SMTs in ICT integration.

The second section focuses on underlying categories in SMTs knowledge, attitudes, vision, and practice on ICT integration. As previously discussed in literature; our knowledge, attitudes, and belief systems often form the way we

see or interpret situations (Botha, 2013). During interviews and conversations, SMT members were questioned about their opinions on ICT and asked to explain how their usage, integration, and practice of ICT had shaped their diverse perspectives. To better understand how people view ICT activities in schools, the knowledge, attitudes, and vision regarding ICT were identified in the context of this study. These areas are divided into different sub-themes depending on the SMT members' responses.

It became evident that SMT members attitudes could be categorised into a variation of sub-themes namely:

4.3.3.1 Favourable attitudes

The analysis of the interview data highlighted that most SMTs showed positive favourable attitudes towards ICT integration. Favourable attitude is defined as a person's positive assessment of a behaviour toward ICT (Shimshack, 2013). SMT favourable attitudes about ICT suggest that they expressed interest in personal growth and competence in ICT usage.

This is best reflected by the HoD and subject head of school B.

[HoD response]:

"I love ICT and as a CAT teacher as well I have so much to show others." This confirms the love for ICT and willingness to teach others and supports the use of ICT in their subject and expressed their willingness to learn more about ICT by stating:

"It has been a real learning experience, never too old to learn" [subject head].

Furthermore, the principal of school A clearly stated his excitement: "*With ICT my experiences were mostly that of great excitement as it now meant we change how we go about our business at school."* Thus, the principal excitement is an indication of their willingness to improve their daily practices at school using ICT.

4.3.3.2 Enthusiastic (training) attitudes

The importance of training emerged from the interviews and discussions with the SMTs of the various schools. They spoke to the importance of being knowledgeable and literate in ICT. Terms such as compulsory training, evaluation and support are often used to describe their enthusiastic attitudes. Therefore, for further analysis we look at their attitudes, respectively. By stating:

"Training and motivation are the main methods"

"We play an active role in ensuring that school manages, and change is effectively controlled." [SMT member school A]

SMT members highlighted that it is mandatory through various policies to be trained by highlighting the pressure of the department of education (DoE) on ICT integration. [SMT member school B]

4.4 Knowledge

The following knowledge systems were prevalent in the findings that correlates with the framework. Furthermore, knowledge can be described as an acquired skill, either by ongoing experiences or direct participation, the information must

be organised and interpreted appropriately, related to the environment (Bakken, 2016).

During the progression of the data analysis, various knowledge categories surfaced namely:

4.4.1 Declarative Knowledge

An SMT offers a unique perspective into the application of knowledge areas in leadership. In relation, SMT members each described their own but similar experiences and challenges which they experienced with ICT integration at their schools. SMT members understood that ICT integration into the curriculum and schooling activities plays a crucial beneficial role for all. They saw the endless benefits of ICT in education beyond high school setting, as one of the SMT members identified that ICT as the “future” of schooling and how we go about our daily lives. Thus, integrating ICT meant that SMT members had elevated expectations on what ICT integration could mean to their school. They were also aware of what potential skills are needed. The vision of schools is to prepare leaders for the future.

That the Department of Education (DoE) aims to use the curriculum to intentionally coordinate and integrate ICT to achieve the goal of equipping all learners with the necessary skills needed and ICT demands of the world. Even though schools are faced with various challenges such as “lack of resources” they (schools) still try to use available ICT resources to the best of their ability.

Thus, concluding that leaders can apply their knowledge with experience to help improve and adapt their leadership skills.

4.4.2 Procedural Knowledge

SMT members do not have extensive ICT integration training nor experience in integrating ICT. If schools need to integrate ICT successfully, then SMT must change their daily habits and approaches to ICT.

One SMT member (HoD) of School B:

"I would like us to integrate it as a school, as most teachers do not use it in their teaching and learning practices, as they do not yet feel comfortable with using the technology. However, because my department deals with technology, it is so especially important that teachers equip themselves now especially as changes are coming. Curriculum has digitised as most things can be learnt, taught online as well."

For schools it might as be as simple as changing patterns of teaching and learning; for other SMT members, it might mean a complete change of school culture to integrate ICT. SMT members who have successfully navigated these changes in ICT described how the integration of ICT provided an opportunity to show transformative leadership; by understanding the change, they could successfully bridge the gap between its learners and teachers to find success in curriculum. This provides SMT members with opportunity to extend learning beyond declarative knowledge and foster actual procedural knowledge and behavioural changes.

4.4.3 Contextual Knowledge

SMT members expressed their concerns with ICT integration. SMT members said that they feel that integrating ICT will cause a disconnect between the physical bond offered between teachers and learners and the various dangers.

Noted by stating that: *"Not all learners have access to ICT devices*" [HoD of school B].

Acknowledging that learners do not have access means that there will be a gap between what is used at school and what the learner must go home and adjust to. However, the selective school culture offered by each school was positive when integrating or trying to integrate ICT. As ICT integration in the curriculum also provides a connection between what is being taught at schools or even from a distance using ICT at home. Through this contextual knowledge setting, SMT members are exposed to not only different forms of leadership but also to societal and cultural needs of the schooling environment.

4.4.4 Semantic Knowledge

Semantic knowledge refers to knowledge about the meaning of words, concepts and symbols. It is a type of knowledge that enables individuals to understand relationships between concepts and the meaning of words. In this study it was prevalent through SMT members shared views about ICT integration and how it influenced their decision making, each SMT members' experience and collective experiences offered mechanisms on how they coped with the demands of ICT. SMT members expressed excitement of ICT as a "never ending learning experience" through the freedom of choosing a variety

of ways to integrate ICT into the curriculum. In addition, semantic knowledge offers SMT members to not only knowledge about ICT but also a focus on the skills needed to integrate ICT effectively.

4.5 SMTs perceptions about ICT integration practices at schools

Most SMT members discussed their excitement for integrating ICT into teaching and learning but acknowledged that there are various challenges that could hamper the overall integration of ICT. This theme focuses on discussing SMTs challenges, beliefs, and perceptions of ICT.

4.5.1 Competence and eagerness of SMT

According to (Botha, 2013; Hayward, 2008) all change, growth and movement are often accompanied by resistance. SMTs in this research indicated a lack of interest from SMT members and teachers in using ICT in their practices as a challenge they experienced. Aside from limited resources, SMT members also expressed their concerns about teachers use and integration of ICT into the curriculum. They identified negative attitudes towards ICT change. The principal A of school A:

“One of the biggest challenges faced are lack of motivation as we have all these wonderful courses and training offered by Western Cape Education Department, once teachers come back from the training and now have to implement it at school, they often find it very difficult as the demographics or types of learners.”

“It is not always used in classrooms and with math teachers find it a bit tricky to teach with technology.” [Senior Teacher A of school B]

In addition, SMT members believe that staff seem to stay with the traditional methods with which they are comfortable with and tend to stay in their comfort zone of teaching and learning. Thus, proving that through this research that various knowledge systems played a key role on the leadership style implemented when it came to integrating ICT into the curricula at their schools.

4.5.2 Lack of support from Department of Education (DBE) and funding for ICT.

During the data analysis, there was a pattern of disconnect between schools and the department of education in the realisation of what schools face when integrating ICT. This can be seen in the comments made by participants below:

“Lack of infrastructure, limited pcs, budget problems.” [Subject head School A]

Furthermore, the evidence from the interviews revealed that regardless of the context in which schools find themselves in the study, all SMTs perceived and experienced financial constraints as an obstacle to successful use and integration of ICT. This notion is also supported and best reflected through a point raise by the Senior teacher at school B: stating that:

“Challenges include perception of teachers, budgeting, lack of resources.”

Apart from these factors, SMT members also shared their experiences about modernising classrooms by using ICT.

4.5.3 Modernising classroom practices by using ICT.

The Head of Department of school B shared a vision for ICT integration and expressed the need to train and equip teachers through using ICT.

"I love ICT and as a CAT teacher as well I have so much to show others." [HOD school B]

Their vision was shared by School A who agreed that the ideal teaching environment is to use ICT.

"With ICT my experiences were mostly that of great excitement as it now meant we change how we go about our business at school." [Principal, School A]

In the excitement of using ICT the ideal classroom situation for ICT integration into their curriculum, SMT also expressed their vision for ICT in teaching and learning. That even though they are faced with various challenged such as lack of support by the DBE that there is still optimism and hope for the future.

4.5.4 Perceived responsibilities of SMT members.

During data collection various roles of responsibility were identified by SMTs based on their perceptions in this study. SMTs were asked to discuss their various perceived roles in ICT accordingly and the following sub-categories were identified:

4.5.4.1 Provide support through training

Various SMT members perceived their role in ICT integration is facilitating, motivating, and identifying various staff for training. They expressed the following:

“The role I play is one of a policy enforcer and delegator. When various policies on ICT are received from DBE, I usually discuss it with my SMT members on a way to integrate various ICT requirements as every year we are evaluated by DBE on how effectively we implemented ICT into our school especially for the delivery of the curriculum.” [Principal school A]

“Basically, by motivating and sending staff to various training to equip themselves on how best to use ICT as an educational tool.” [deputy principal school A]

“To ensure we keep up with the changes and that all staff is trained.” [HOD school A]

“We try and have regular training; class visits; mentorship programmes to encourage ICT” [Principal school B]

SMT members have promoted the use of ICT by providing teachers with the required training to ensure competency and confidence in teaching with ICT. The principals of the various schools believe that in providing staff with support, monitoring, and resources, SMTs may eliminate challenges faced with ICT integration. Similarly, schools believed that promoting the benefits of ICT in teaching and learning at their schools will create a greater atmosphere for the integration of ICT. It is evident from the data collection that SMTs from school A that they have responsibilities of integrating ICT.

4.6 Integration of ICT into the curriculum.

The new CAPS curriculum policy implemented by the Department of Basic Education in 2012, has left SMT members questioning their role in ICT (Botha, 2013). Furthermore, throughout interviews and discussions, they often highlighted the crucial role played by “policy” in adherence to ICT integration at their schools. This has resulted in SMTs looking at strategies and investment opportunities in ICT to use ICT at schools. They also highlighted the importance of ensuring that various departmental and subject heads communicated to other staff on what is expected in the curriculum for ICT. In addition to this?, …. believe that various educational programs for language and math teachers specifically makes use of ICT for their learning and teaching experiences. The views expressed by SMTs is support that they realise the importance of integrating ICT into the curriculum. Furthermore, these views indicate positivity in the practice of ICT in their curriculum for the future.

4.7 Conclusion

This chapter presented the findings from the data analysis of the semi-structured interviews and focus group discussions about SMT role in ICT integration. The findings were therefore categorised and grouped into various themes and sub-themes that aimed to answer the research questions. The findings from the data analysis suggested that SMT members had both positive and negative experiences. On the contrary to the knowledge, attitudes, beliefs, and perception, SMT members also had strong beliefs about training. SMTs highlighted that its compulsory to attend various courses in ICT, as they

perceived it to be a necessity and even mandated by DoE policy reforms to use ICT, while other SMT members felt that ICT integration in curriculum could not replace the human touch in education.

Furthermore, the findings revealed that there were common experiences in that ICT is important to the future of education because it enhances the overall delivery of teaching and learning thus creating a sense of empowerment in SMT schooling environment to become more ICT equipped. However, there are contradictory beliefs caused by the variety of challenges faced by SMT members with ICT suggests that SMT members believe that both intrinsic and contextual factors play a role in ICT integration. Findings also identified SMTs vision of ICT at their schools, which included transformation of the curriculum to ensure ICT integration in teaching and learning. SMT members also highlighted their roles of responsibilities for ICT integration and the necessary things needed to make ICT integration a success in their schools.

Chapter 5

5.1 Introduction

This chapter presents a summative overview on the key findings of this research in conjunction with the literature, data collection and framework used in this study. Knowledge that surfaced from this study and suggestions for further research will be presented. Furthermore, this chapter concludes with recommendations for ICT integration in the curriculum for teaching and learning.

5.2 Summary of findings

In the following sections, the findings of the research were grouped according to the various research questions and sub-questions.

5.2.1 SMT leadership role in ICT integration into their curriculum

Although SMTs have different leadership and management styles that they follow in aid of their role / influence at schools, the following characteristics stood out as having an impact on their formed perceptions:

- ☞ SMT members' level of knowledge about appropriate leadership needed for ICT integration.
- ☞ Pre-established aims, goals, and objectives towards ICT integration.
- ☞ Delegation of responsibility and authority of ICT integration into the curriculum at their schools.
- ☞ SMT members' attitudes towards ICT integration.

- ☞ SMT member knowledge could overall lead to positive / negative integration of ICT at their schools.

Through the semi-structured interviews and focus group discussions it became evident that their leadership styles were diverse in their various roles as SMT members. The findings suggested that there were common leadership roles. It was evident from the data collection that SMTs exerted distributive, transformational, and pedagogical leadership styles towards ICT integration. In further analysis of their styles, it was found their leadership styles in ICT integration inertly? play a crucial role in the degree to which they perceive ICT to be effective in schools. Literature suggests that a great degree of transformational leadership is needed towards successful ICT integration.

5.2.2 The knowledge, attitude, vision, and practice of the SMTs towards ICT integration.

The main research question was aimed to investigate the knowledge, attitude, vision, and practice of the SMTs towards ICT integration. It became prevalent that the SMT acts as an integral part of their school and thus highlighting that the principal of a school cannot be examined (studied) on their own but a collaborative (delegator) member of the SMT. Through the findings it has, highlighted the importance of SMTs leadership towards ICT at their school and the style of leadership used to influence (promote) teachers to integrate ICT in their practice. Furthermore, SMTs leadership styles were also influenced by their ability, skill, knowledge on how to integrate ICT themselves. School A and B highlighted various key factual evidence that not only is it required from

schools to integrate ICT it is also mandated by the Department of Education through various policy reforms such as the white paper on E-education to comply to a certain national standard and one could also state the latter effects of SMT ability to delegate matters that could lead to lessened accountability of a single member (Botha, 2013), as a strategic conglomeration series of events to ensure successful integration of ICT.

The findings concur with literature in that SMTs, and Principals' leadership styles are major influencers of success at schools (DoE, 2015). The SMT members highlighted various continuous workshops provided by the department of education to encourage confidence in ICT practices at schools despite facing various socio-economic issues such as lack of resources. When mentioning the lack of resources, one cannot overlook the question that even though DBE mandates schools to utilise ICT in teaching and learning, schools, still feel that ICT is a farfetched reality as they (schools) have other matters to focus on as highlighted previously in the findings. Even though there are schools that have access to what we would label as "adequate" resources to integrate ICT, its learners might not have access to it at home. Therefore, we could conclude that even though ICT plays a vital role at schools in delivering curriculum, that while there is still a "digital divide," an ICT divide amongst schools that much more initiative on SMT leadership needs to be done, through continuous reform of SMT attitudes, knowledge, and beliefs towards ICT integration (Zwaneveld, B., et al., 2010).

Furthermore, the decisions and actions are not solely subjected to the attitudes, knowledge, and beliefs SMT members have which asserts that ICT decisions

are caused by attitudes caused by beliefs, emotions, and values they hold, which then forms their perceptions and behaviours (Lines, 2005). Based on the findings it became evident that SMTs play a significant role in ICT integration at their respective schools. SMT members acknowledged the importance of ICT into their schools' vision, mission, and goals for the future of curriculum delivery at their school. Another belief was that SMT members felt that ICT is regarded as "highly important" for the future of their learners though SMT members highlighted that ICT integration is still a "farfetched" dream for schools who lack infrastructure to integrate ICT at their schools.

The findings are substantiated by SMTs beliefs that learners progressing through the current education system must develop the required ICT skills to prepare themselves for the future (Afshari, et al., 2008). In additions, to this SMTs beliefs reflected that there are various challenges that exist, such as lack of infrastructure, inadequate resources, and lack of skills. Literature and findings corroborate that SMT members' perceptions of ICT cultivates their beliefs and attitudes about their role in curriculum delivery (Botha, 2013).

From the analysis of the semi-structured interviews and focus group discussions, it became evident that SMT members are expected to perform distinct roles in ICT integration and curriculum process, as SMTs expressed what they perceived to be expected from them. They believed that their leadership role naturally means that teachers and other non-teaching staff looks up them to motivate ICT integration through their practices. All SMT members highlighted that through their modelling and promoting the use of ICT,

it may influence others positively to use ICT too. They also believed that it is the SMT members' responsibility to provide continuous support through workshops.

Furthermore, SMTs elaborated on the necessary conditions needed to realise their dream of ICT. SMT members mentioned that even though it is mandated by the DBE through various policies, ICT integration remains a challenge. The reality is that to comply with these various policy reforms that are mandated by the DoE, certain conditions need to be met, such as infrastructure, resources, supplies and school assessment needs for ICT. This hugely impacts SMT members' attitudes and commitment. Similarly, SMT members in Botha (2013) study also indicated that the lack of resources and support by SMT members to teachers' expresses concerns about the absence of ICT integration in the national curriculum policy per subject. In making decisions to incorporate ICT into the curriculum, Botha (2013) substantiates that ICT integration requires vision, commitment, and strong leadership from SMT members. This notion is supported by Brockmeier et al., (2005) who asserts that there are challenges such as mentioned, but the lack of expertise also needs to be addressed.

Consequently, SMT members conveyed that there is still a great need for continuous reforms in ICT at school levels. Furthermore, findings of the study substantiate that through vigorous training then only the dream of "ICT integration" at school levels can be realised. This will aid in the ever-changing world of technology. These findings are supported by (Ndou, 2009; Botha,

2013; DoE, 2013;), who corroborate that there is a strong correlation between formal training in ICT and ICT leadership.

In conclusion it is evident that SMT perceptions (belief, attitudes, and visions) for ICT integration in education could influence their level of integration at their schools, as it is subject to required provisions and creating an atmosphere of integration which includes all stakeholders of the school.

5.3 Conclusion

The significance of the findings that emerged will be discussed against the theoretical framework for the study. The findings show that distributed leadership, pedagogy, and transformational leadership all forms an integral part of ICT integration. It is important to note that the three different leadership perspectives guiding the study are not mutually exclusive, but each one is widely acknowledged as an effective model for researching school principals as ICT leaders (Day et al., 2014; Ottestad, 2013). In the context of this, SMTs practice can be seen as their distributive role in ICT integration, which ideally influences their attitude towards ICT integration. SMTs knowledge, can influence their overall attitudes, beliefs, and vision. The transformational leadership could be described through their decisions, integration, and practice of ICT.

Consequently, not all perspectives of ICT integration theory of Day and Summons (2013) are consistent with the realities of ICT integration today. The majority of SMTs highlighted that through their leadership they can influence others whereby others seemed unbothered by the change thus deeming ICT

integration as a “dream” yet to be realised at schools. Furthermore, various principals viewed ICT integration as compulsory at their school in conjunction with the regulations stipulated by the Department of Education through various policy reforms to be implemented at schools in relation to ICT integration into teaching and learning. There were SMTs that were adamant about ICT integration into their own practices as they felt that there are still learners who do not have adequate access or lack resources to fully enjoy the benefits of ICT integration at their school. SMTs believed that through their distributive role that ICT integration is a team effort that should be an integral part of their school vision for the future.

5.4 Recommendations

SMTs have expressed their detailed attitudes, beliefs, perceptions, and knowledge about ICT integration at the various schools. ICT integration was labelled as the future of teaching and learning, to enhance the quality of teaching and learning. Thus, SMTs are seen as leaders in the ICT integration process and take various measurements such as:

1. With the aid of ICT integration into the curriculum, a school setting that reaches far beyond a physical school, to a more complex exciting online platform for both learners and teachers to explore can be realised. All SMT members should be trained not only the selective SMT members deemed responsible for ICT integration at the school.
2. Furthermore, it became prevalent that SMT members and the principal should become more aware of the variation of leadership styles

available to be implemented at their various school to encourage ICT integration into the school curriculum at their schools.

3. Budgeting, planning into the schools' vision could establish a comprehensive approach to ICT integration.
4. by not only compelling teachers to attend various workshops mandated by the Department of education but by leading by example as SMT members, by facilitating regular training opportunities for all to develop their ICT knowledge and skills.

5.5 Suggestions for further study

The following areas for further study are suggested, namely:

1. How did lockdown due to COVID-19, impact SMTs perception about ICT integration for teaching and learning at schools?
2. How do SMTs knowledge systems foster successful integration of ICT into teacher's pedagogical approaches?

Teaching and learning in a technologically equipped environment, proved the importance of ICT literacy and skills needed by all stakeholders of the schooling system (DoE, 2013). Consequently, ICT integration in schools has become the critical in the 21st century. However, the successful integration of ICT in practice is yet to be explored. Keeping in mind that SMTs have a tremendous influence on ICT integration through their leadership modelling of ICT through initiating, promoting, and implementing ICT integration into the curriculum. Consequently, these espoused beliefs, attitudes, visions, and perceived necessary provisions, could establish the ethos within a school (Botha, 2013).

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Appendix A- CPUT Permission acceptance letter

Appendix A (permission letter)

Dear Sir/Madam

Request for permission to conduct research at your school.

I am currently registered for my master's degree at Cape Peninsula University of Technology. The title of my research project is: The leadership role of school management teams in Information Communication Technology integration in the curriculum at public high schools in Cape Town.

I am kindly requesting your permission to interview the following School Management Team members at your school:

1. You in your capacity as the Principal.
2. Five members of your School Management Team Namely Principal, deputy principal(s), Head of Department(s), one Grade head and or Subject head, and a teacher representative on the School Management Team.

These interviews will be administered at a convenient time to the above participants. There will be individual and focus group interviews. I plan to undertake this research in July/August 2020.

I have obtained clearance from the WCED informing me of the research guidelines as well as the Cape Peninsula University of Technology ethical clearance.

Please note that under no circumstances will the school and participants in this research be named, instead variable names such as school X will be used when referring to school and members.

Appendix B -WCED Permission

Audrey.wyngaard@westerncape.gov.za

Directorate: Research

tel: +27 021 467 9272

Fax: 0865902282

Private Bag x9114, Cape Town, 8000

wced.wcape.gov.za

REFERENCE: 20200714-6957

ENQUIRIES: Dr A T Wyngaard

Ms Tina-Jane Oladokun

20 Saint John's Street

Cape Farm

7441

Dear Ms Tina-Jane Oladokun

RESEARCH PROPOSAL: THE LEADERSHIP ROLE OF SCHOOL MANAGEMENT TEAMS IN INFORMATION COMMUNICATION

TECHNOLOGY INTEGRATION IN THE CURRICULUM AT PUBLIC HIGH SCHOOLS IN CAPE TOWN

Your application to conduct the above-mentioned research in schools in the Western Cape has been approved subject to the following conditions: ("DECLARATION - open.cpuct.ac.za")

1. Principals, educators, and learners are under no obligation to assist you in your investigation.
2. Principals, educators, learners, and schools should not be identifiable in any way from the results of the investigation.
3. You make all the arrangements concerning your investigation.
4. Educators' programmes are not to be interrupted.
5. The Study is to be conducted from **01 July 2020 till 30 September 2020.** No research can be conducted during the fourth term as schools are preparing and finalizing syllabi for examinations (October to December).
6. Should you wish to extend the period of your survey, please contact Dr A.T Wyngaard at the contact numbers above quoting the reference number?
7. A photocopy of this letter is submitted to the principal where the intended research is to be conducted.
8. Your research will be limited to the list of schools as forwarded to the Western Cape Education Department.

9. A summary of the content, findings and recommendations is provided to the Director: Research Services.

10. The Department receives a copy of the completed report/dissertation/thesis addressed to:

The Director: Research Services

Western Cape Education Department

Private Bag X9114

CAPE TOWN

8000

We wish you success in your research.

Kind regards.

Signed: Dr Audrey T Wyngaard

Directorate: Research

DATE: 17 July 2020

Appendix C- Interview protocol

Date: _____ Time of the interview: _____

School reference: _____ Interviewee Reference: _____

Research site:

Table 3: Research Site

School A	School B

SMT member status:

Table 4: SMT Status

Principal	Deputy	HOD	Subject Head	Grade Head	Other

Interview procedure:

1. Start by introducing myself as the researcher.
2. Thank the participants for volunteering to be part of the research and taking time to answer various questions.
3. Make participants completely aware that it is completely voluntarily that at any given time they may withdraw.
4. Ensure their anonymity.

Individual interview questions for all members of the School Management Team.

1. As a SMT member do you feel like you have a leadership role at your school? Elaborate.
2. How does your role of the SMT"s impact on effective school leadership?
3. What is your view about ICT integration in the curriculum at your school? Do you think it is important or not? Elaborate?
4. In your experience as a member of the SMT, what role to do you play in ICT integration in the curriculum? Elaborate?
5. How do you as an SMT member encourage the integration of ICT at your school?
6. What methods or strategies do you and the teachers use to integrate ICT in the curriculum?
7. What is the role of the school management team in curriculum change management?
8. What challenges do you experiences an SMT member in the integration of ICT at your school for teaching and learning?
9. Has the integration of ICT at your school changed your school's culture? If yes, in what way?
10. What are your experiences?

Focus group interview questions.

1. What in your words comes to mind when you think about ICT integration at your school?
2. What knowledge do you possess in the integration of ICT into your curriculum?
3. What are the factors that influence ICT practices in the curriculum?
4. How do you as members of SMT perceive your leadership role in ICT integration in the curriculum at your school?
5. Are you as the SMT in charge of ICT integration at your school or do you delegate responsibility of it to someone else at your school, or outsource it?
6. What challenges do you as SMT experience in encouraging ICT integration in the curriculum at your schools? Also,
7. What are the strategies would you suggest, that may/can be employed in managing ICT challenges?
8. Would you as SMT lead the way for the usage of ICT in your school? Why?
9. What are SMT views on ICT integration?
10. How important is it for the SMT to be trained in ICT? Why?

Appendix D – Analysis of data

School A semi-structured interviews school A

Table 5: School A: Data Analysis

SMT member 1 (Principal) of School A		
Questions	**Answers**	**Analysis (Keywords)**
1.As a SMT member do you feel like you have a leadership role at your school? Elaborate.	"As a principal of a school on a daily basis I am expected to naturally lead by example as many of my staff, teachers and learners depends on me to make an impact on the way the schools is run; I believe that if all principals enforce ICT into their schools daily practices it will automatically water down to how teaching and learning should be done however most of my roles at the school are delegated to my SMT members to help me achieve what is entirely needed for the school. "	(Natural leader)
2.How does your role of the SMTs impact on effective school leadership?	"I passionately believe that if a school has a strong SMT then all practices and daily tasks becomes easier, as we all work together to achieve one goal and that is to deliver the best learners for the world. "	(Leadership/team work)
3.What is your view about ICT integration in the curriculum at	"ICT integration plays a vital role at school due to the way it has changed the way teaching, and	(**perception)**

your school? Do you think it is important or not? Elaborate?	learning takes place. I remember years ago when I started as a teacher there were no digital devices. We had to teach using the chalk & board method or textbook referencing. Now in this new era of technology learners and teachers have so much technology that made it easier to teach and even learn, as a school is no longer seen as a place for learning a curriculum as learners may use technology. So, it is especially important especially now that we have these kids that are so advanced with ICT tools to also bring or integrate it into the teaching and learning. ”	
4.In your experience as a member of the SMT, what role to do you play in ICT integration in the curriculum? Elaborate?	“The role I play is one of a policy enforcer and delegator. When various policies on ICT are received from DBE, I usually discuss it with my SMT members on a way to integrate various ICT requirements as every year we are evaluated by DBE on how effectively we implemented ICT into our school especially for the delivery of the curriculum. ”	(Delegation)
5.How do you as an SMT member	“Mainly encourage or maintain ICT integration through various	(**perception)**

encourage the integration of ICT at your school?	assessment practices by using ICT as a tool for change."	
6.What methods or strategies do you and the teachers use to integrate ICT in the curriculum?	"Our strategy at school focuses on moving away from traditional methods of curriculum delivery to a more learner independent using ICT into their teaching and learning at the school. "	(Practice)
7.What is the role of the school management team in curriculum change management?	"The role of SMT is one of a change-maker in change at the school especially when it comes to ensuring that various measurements, whether it be staff training in ICT, Teaching, and learning or the general morale of the school. Usually when it comes to curriculum change as management, we ensure that first that we are trained in change management and through this we ensure that we support lesson planning or preparation, provide support where needed and constant monitoring of teachers."	**(Challenge)**
8.What challenges do you experiences an SMT member in the integration of ICT at your school for	"One of the biggest challenges faced are lack of motivation as we have all these wonderful courses and training offered by Western Cape Education Department, once teachers comes back from	**(Challenge)**

teaching and learning?	the training and now have to implement it at school they often find it very difficult as the demographics or types of learners they have are not digitally inclined when it comes to using their technology for education, as learners often become distracted by their devices by either playing games or just do not have a device at all, as we are situated in one of the poorer areas. The lack of devices or computers available at school, often results in us using books instead."	
9.Has the integration of ICT at your school changed your school's culture? If yes, in what way?	"ICT has definitely changed our school culture, as it digitised everything we do, making it easier and simpler."	(**perception)**
10. What are your subjective experiences when using ICT.	"With ICT my experiences were mostly that of great excitement as it now meant we change how we go about our business at school."	(**Attitude)**

SMT member 2 (Deputy-Principal) of School A		
Questions	**Answers**	**Analysis (Keywords)**
1.As a SMT member do you feel like you have a leadership role at your school? Elaborate.	"Most definitely; often find me discussing with staff on ways to improve school and how best to guide staff in improving matters at school."	Improve matters (educational leadership)
2.How does your role of the SMT impact on effective school leadership?	"My role on the SMT is to support the principal as I collaborate closely with him in decision making before taking it to the rest of the SMT, as a team we unite to make sound decisions. "	Support (Teamwork) Decision making (management)
3.What is your view about ICT integration in the curriculum at your school? Do you think it is important or not? Elaborate?	"My view on ICT in the curriculum is that it involves using ICT equipment such as devices in out Teaching and learning practices. During, the pandemic ICT played a huge role in getting the content to the learners, as it was especially important to us that we reach out to them. "	(**perception)**

4.In your experience as a member of the SMT, what role to do you play in ICT integration in the curriculum? Elaborate?	"To be honest when it comes to ICT integration, I do not have much to say as we often delegate what is expected to teachers. "	Attitudes toward ICT
5.How do you as an SMT member encourage the integration of ICT at your school?	"Basically, by motivating and sending staff to various training to equip themselves on how best to use ICT as an educational tool."	(Training)
6.What methods or strategies do you and the teachers use to integrate ICT in the curriculum?	"I will say as a school our strategy is to ensure that there is funding first of all for ICT as SMT/SGB and teachers, that all our teachers are trained to teach using ICT."	
7.What is the role of the school management team in curriculum change management?	"To manage change."	Change management (Perceived role)
8.What challenges do you experiences an SMT member in the integration of ICT at your school for teaching and learning? 9.Has the integration of ICT at your school changed	"Challenges such as lack of funding as we prioritise what is best for our schools first such as having enough textbooks as we only partially funded through	Funding Availability of resources

your school's culture? If yes, in what way?	government. Also, availability of ICT tools such as computers."	
10. What are your experiences in using ICT.	"**Personal experience** it has made life easier and has been an immense help during the pandemic to keep track with school staff."	(**perception)**

SMT member 3 (HOD) of School A		
Questions	**Answers**	**Analysis (Keywords)**
1.As a SMT member do you feel like you have a leadership role at your school? Elaborate.	"As the Head of Department (HOD) at school and SMT member I feel that yes, I do have a role especially one by which I am responsible to lead those in my department to one common goal. "	(Leadership) (Teamwork)
2.How does your role of the SMTs impact on effective school leadership?	"It has an enormous impact on how the school is run as we continuously review the school vision for improvement to not only understand what's needed from various	(Teamwork)

	stakeholders but to also to communicate what we are doing to ensure that no staff is left behind."	
3.What is your view about ICT integration in the curriculum at your school? Do you think it is important or not? Elaborate?	"My view is that if used correctly it will ultimately have endless positive advantages that is important to help aid preparing for the future."	(**perception)**
4.In your experience as a member of the SMT, what role to do you play in ICT integration in the curriculum? Elaborate?	"One example as staff often follows what you as the HOD has **delegated** to them and often try to do what you do."	(Leadership role/Teamwork)
5.How do you as an SMT member encourage the integration of ICT at your school?	"By making it compulsory to all in my department that every learner should at least visit the computer lab to complete various CAMI programmes."	(knowledge/Attitude)
6.What methods or strategies do you and the teachers use to integrate ICT in the curriculum?	"By making use of ICT educational tools in our teaching and learning the key is to ensure that proper lesson planning is done."	(Teaching and learning)
7.What is the role of the school management team	"To ensure we keep up with the changes and that all staff is trained."	(Training)

in curriculum change management?		
8.What challenges do you experiences an SMT member in the integration of ICT at your school for teaching and learning?	"It is not always used in classrooms and with math teachers find it a bit tricky to teach with technology."	**(Challenge)**
9.Has the integration of ICT at your school changed your school's culture? If yes, in what way?	"Yes, because now instead of just listening to the teacher, they (learners) have access to a world of current information."	(Change)
10. What are your experiences in using ICT.	"With ICT I now have more resources available than before, with just a click of a button I have so many resources to share."	(Cheerful Outlook)

SMT member 4 (HOD) of School A		
Questions	**Answers**	**Analysis (Keywords)**
1.As a SMT member do you feel like you have a leadership role at your school? Elaborate.	"Yes, I do as we are part of all decision making as a team."	(Teamwork)

2.How does your role of the SMT‟s impact on effective school leadership?	“The role as SMT is as vital as teachers are to learners. You cannot ensure a great school without great educators and staff.”	
3.What is your view about ICT integration in the curriculum at your school? Do you think it is important or not? Elaborate?	“My view is that if we are to compete and bring the best to our learners, that we need to ensure that we bridge the gap between learners and many old schoolteachers by becoming technologically savvy by our teaching and learning practices. By having all teacher’s computer literate and trained as we still have “a few” oldies who battle with ICT, at school we try our best to motivate staff through training to equip themselves through ICT into their teaching. Therefore, our vision is to equip all.”	**(Challenge)**
4.In your experience as a member of the SMT, what	“As an HOD I will say as a leader I take initiative	(leadership)

role to do you play in ICT integration in the curriculum? Elaborate?	to ensure that we use ICT in teaching and learning as soon ICT is going to be the new way of life which was very relevant during the pandemic as many found themselves relying on ICT."	
5.How do you as an SMT member encourage the integration of ICT at your school?	"By creating opportunities for staff to come and share their experiences with other staff through various training and development meetings at school, also show all staff the need of ICT."	(Training and ??)
6.What methods or strategies do you and the teachers use to integrate ICT in the curriculum?	"By highlighting that with the new CAPS document that makes provisions for computer usage and using various periods to equip learners by using computers during ''lab sessions'' to complete various tasks. Teachers are also encouraged to use various programmes for maths/science and	(CAPS)

	reading in their subjects."	
7.What is the role of the school management team in curriculum change management?	"When it comes to curriculum changes, I will say that as SMT we usually put into our mandate how various policy reforms needs to be implemented into our school especially with ICT, once you make certain things compulsory such as using ICT or E-learning practices, teachers and staff will find that they have to adapt and then integrate what's needed."	(CAPS)
8.What challenges do you experiences an SMT member in the integration of ICT at your school for teaching and learning?	"That learners often think that ICT can replace the teacher when it is impossible as teachers are trained in teaching all types of learners when ICT is a one size fits all. During the lockdown learners often asked me to explain various concepts been after they have watched various	(Attitude)

	videos. Thus, teachers offer a personalised touch. ”	
9.Has the integration of ICT at your school changed your school’s culture? If yes, in what way?	“Yes, as we now have assorted items such as smartboards, interactive devices whereby before we only had chalk, blackboards and now with ICT learners are becoming more independent.”	(**perception)**
10. What are your experiences in using ICT.	“I believe that it has been great revolution and development in human history however I do feel that the moral compass of ICT is causing danger such as learns used devices for other purposes at school other than learning.”	(**perception)**

SMT member 5 (Subject Head) of School A		
Questions	**Answers**	**Analysis (Keywords)**
1.As a SMT member do you feel like you have a leadership role at your school? Elaborate.	"Yes, I do"	
2.How does your role of the SMT"s impact on effective school leadership?	"To be honest I do not know as I usually follow directives from other SMT members."	(Leadership role to be determine like democratic leadership style)
3.What is your view about ICT integration in the curriculum at your school? Do you think it is important or not? Elaborate?	"**If** all our teachers use ICT, then it will definitely go down to the learners."	(**perception)**
4.In your experience as a member of the SMT, what role to do you play in ICT integration in the curriculum? Elaborate?	"Because I am subject head, I need to ensure **that CAPS** alignment for my subject is adhered to by highlighting various changes and what is now expected through ICT integration."	(CAPS)
5.How do you as an SMT member encourage the	"By creating development	(Attitude)

integration of ICT at your school?	opportunities in ICT and encouraging training as a merit system."	
6.What methods or strategies do you and the teachers use to integrate ICT in the curriculum?	"Strategies include various reforms such as class visits, similar to what is done evaluation purposes to check personal teaching growth."	(Practice)
7.What is the role of the school management team in curriculum change management?	"Is to take the lead and implement change"	(Change management/leadership)
8.What challenges do you experiences an SMT member in the integration of ICT at your school for teaching and learning?	"Lack of infrastructure, limited pcs, budget problems."	(**(Challenge)**
9.Has the integration of ICT at your school changed your school's culture? If yes, in what way?	Yes, as the school is no longer seen as the only place to learn.	(**perception)**
10. What are your experiences in using ICT.	Is that it is a never-ending learning curve just when you thought you figured out one thing a new	Practice/knowledge

	development has become known in ICT.	

Focus group interview questions and discussion school A

1. What in your words comes to mind when you think about ICT integration at your school?
    - P1 ICT means being able to use technology. **(perception)**
    - P2 ICT means being able to communicate using technology. **(perception)**
    - P3 ICT means to be tech savvy. (**perception)**
    - P4 Computers, cell phones and the internet. (**perception)**
    - P5 Gadgets and smart devices**. (perception)**
2. What knowledge do you possess in the integration of ICT into your curriculum?

- P1, I have been computer trained during years of studying and attending various courses provided by DBE. **(knowledge)**
- P2 As my colleague mentioned being computer literate. **(Training/ Knowledge)**
- P3 how to use computer devices to teach. **(Practice)**
- P4 being able to participate in online district roles as during lockdown we had so much MS Team meetings. **(practice)**
- P5 Being computer literate. **(Knowledge)**

3. What are the factors that influence ICT practices in the curriculum?
    - P1 at school I will say the social background in which the learners are being taught and expected to learn in as the environment plays a crucial role. **(Challenge/perception)**

- P2 Having access or let me say adequate access to ICT resource. **(Challenge)**
- P3 Teachers ICT knowledge and knowhow. (**Perception)**
- P4 Computer literacy. **(Knowledge)**
- P5 Computer literacy.

4. How do you as members of SMT perceive your role in ICT integration in the curriculum at your school?
    - P1 Will say that I perceive my role as one of leadership. As we often lead by example. (**Perception)**
    - P2 perceives role as a delegator being able to share tasks and responsibilities when it comes to ICT.
    - P3 As one an enforcer, frequently we lead by example. (**Perception)**
    - P4 When it comes to ICT, I am not sure how it affects the overall curriculum for my subject however I allow free reign to those in my subject team to incorporate it, as I am still a bit old school. (**Teamwork)**
    - P5 I will say I perceive my role as a passive integrator as we often tasked with so many changes that needs to be adhered to in terms of using ICT in delivery curriculum. (**Perception)**
5. Are you as the SMT in charge of ICT integration at your school or do you delegate responsibility of it to someone else at your school, or outsource it?

- P1 As a principal I am in charge delegating various tasks to the SMT who decides on various ICT practices. (**leadership)**
- P2 As deputy principal: “I ensure that all teachers are equipped with the required training courses to gear them up for teaching with ICT”. (Knowledge)
- P3-5 As subject heads and HODs we often outsource it to our staff in our subject or department. (**Perception)**

6. What challenges do you as SMT experience in encouraging ICT integration in the curriculum at your schools? Also,
    - Lack of funding. **(Challenge)**
    - Lack of physical computers / devices. **(Challenge)**
7. What are the strategies would you suggest, that may/can be employed in managing ICT challenges?

We use policy and legislation as a mean of strategy to enforce that all teachers are equipped with the necessary skills to teach using ICT. (??)

8. Would you as SMT lead the way for the usage of ICT in your school? Why?

    Yes, we would as we believe in creating a sustainable learning environment

    for all learners by preparing them for the real world through use of technology.

    (Challenge)

9. What are SMT views on ICT integration?

That is government came out to schools and realised what we are facing that they would implement a better strategy so that all our learners in South Africa will be able to use this powerful tool of ICT at schools.

10. How important is it for the SMT to be ICT trained? Why?

It is not only important for us as SMT to be equipped, but also for our teachers so

that we can be the best at what we do for the learners and reach them through various ICT tools. (**Perception)**

School A semi-structured interviews school B

Table 6: School B Data Analysis

SMT member 6 (Principal) of School B		
Questions	**Answers**	**Analysis (Keywords)**
1.As a SMT member do you feel like you have a leadership role at your school? Elaborate.	"As the principal of the school it is very important for me to communicate and lead by example especially in conjunction with those SMT members in all decision making."	(leadership)
2.How does your role of the SMT‟s impact on effective school leadership?	"As a principal I automatically need to ensure that all stakeholders, SMT and community of schooling needs to be involved to ensure that we create a great school for all. "	(leadership)
3.What is your view about ICT integration in the curriculum at your school? Do you think it is important or not? Elaborate?	'ÏCT integration in our curriculum entails being able to teach and learn using ICT technology; not only that but to effectively use it in our practices. "	(perception)
4.In your experience as a member of the SMT, what role to do you play in ICT	"I am the one who receives all policies and often evaluated by	(policies)

integration in the curriculum? Elaborate?	WCED district on school ICT readiness so I would say when it comes to ICT, I ensure that all teachers integrate it in their practices; also delegate it to our HOD and champion to constantly monitor the change"	
5.How do you as an SMT member encourage the integration of ICT at your school?	"We try and have regular training; class visits; mentorship programmes to encourage ICT"	(Practice)
6.What methods or strategies do you and the teachers use to integrate ICT in the curriculum?	'" We receive a mandate of WCED that we need to implement"	(policy)
7.What is the role of the school management team in curriculum change management?	"When it comes to curriculum change, I often delegate this with SMT members on a way forward to not only manage but take initiative"	(leadership)
8.What challenges do you experiences an SMT member in the integration	"Challenges include perception of teachers, budgeting, lack of resources."	(Challenges)

of ICT at your school for teaching and learning? 9.Has the integration of ICT at your school changed your school's culture? If yes, in what way?	"It has changed our vision so much that we needed to change and become more ICT inclined to lead the future of schooling"	(leadership)
10. What are your subjective experiences in using ICT.	"Not that great, but through training I am growing my knowledge every day."	(Perception)

SMT member 7 (Deputy-Principal) of School B		
Questions	**Answers**	**Analysis (Keywords)**
1.As a SMT member do you feel like you have a leadership role at your school? Elaborate.	“Yes, we definitely we lead by example.”	(leadership)
2.How does your role of the SMT"s impact on effective school leadership?	“We have a very effective team leading the school as its needed during the time of this pandemic.”	(leadership)
3.What is your view about ICT integration in the curriculum at your school? Do you think it is important or not? Elaborate?	“I love using technology in my teachings especially in the language department as it provides such a vast learning tool with so many possibilities that we have no choice but to use it.”	(Perception)
4.In your experience as a member of the SMT, what role to do you play in ICT integration in the curriculum? Elaborate?	“In our curriculum I will say my role is very submissive /passive as we often have our HOD Mrs A and our ICT champion encouraging and monitoring ICT integration in our teaching and learning. ”	(leadership/Team)
5.How do you as an SMT member encourage the	“I think so, our manager keeps record of all	(Practice)

integration of ICT at your school?	practices/training/support offered at school."	
6.What methods or strategies do you and the teachers use to integrate ICT in the curriculum?	"We follow the one that is mandated by WCED	(policy)
7.What is the role of the school management team in curriculum change management?	"" Not much as we often rely on the entire SMT as a team to manage changes."	(leadership/Team)
8.What challenges do you experiences an SMT member in the integration of ICT at your school for teaching and learning? 9.Has the integration of ICT at your school changed your school's culture? If yes, in what way?	"Lack of equipment." "Resources" "Training and availability." "It has definitely changed as learners are more independent but dependent on ICT"	(Challenges) (Perception)
10. What are your subjective experiences in using ICT.	"I Love learning about ICT"	(Perception)

SMT member 8 (HOD) of School B		
Questions	**Answers**	**Analysis (Keywords)**

1.As a SMT member do you feel like you have a leadership role at your school? Elaborate.	“Yes, I do however I cannot do it without the role of my SMT.”	(leadership/Teamwork)
2.How does your role of the SMT‟s impact on effective school leadership?	“As a team we are more effective”	(leadership)/ Team
3.What is your view about ICT integration in the curriculum at your school? Do you think it is important or not? Elaborate?	“ICT has changed it the way curriculum is delivered so much that we no longer only use books, we now use WhatsApp, MS teams and it is important to quip oneself because it automates so many processes. ”	(Believes/Perception)
4.In your experience as a member of the SMT, what role to do you play in ICT	“We play a very important role as ultimately what we do or	(Believes/Perception)

integration in the curriculum? Elaborate?	how we perceive ICT can either positively or negatively impact on ICT into our teaching and learning.”	
5.How do you as an SMT member encourage the integration of ICT at your school?	“By using it in my practices daily, send my team for training.”	(Training)
6.What methods or strategies do you and the teachers use to integrate ICT in the curriculum?	“Training and motivation are the main methods as it is compulsory”	(practice)
7.What is the role of the school management team in curriculum change management?	“We play an active role in ensuring that school manages, and change is effectively controlled.”	(practice)
8.What challenges do you experiences an SMT member in the integration	“Lack of funding/Data”	(Challenge)

of ICT at your school for teaching and learning? 9.Has the integration of ICT at your school changed your school's culture? If yes, in what way?		
10. What are your first-hand experiences in using ICT.	"It's tricky but getting there."	(Perception)

SMT member 9 (HOD) of School B		
Questions	**Answers**	**Analysis (Keywords)**
1.As a SMT member do you feel like you have a leadership role at your school? Elaborate.	"We all have a responsibility as departmental heads and SMT to lead and work together for a better future or practices. I believe if all SMT are fully trained as there are still some who are still not trained."	(leadership/teamwork)

2.How does your role of the SMT‟s impact on effective school leadership?	“I feel that as a HOD it’s very important and it plays an integral role on how effectively the school is management.”	(leadership/teamwork)
3.What is your view about ICT integration in the curriculum at your school? Do you think it is important or not? Elaborate?	“I would like us to integrate it as a school, as most teachers do not use it in their teaching and learning practices, as they do not yet feel comfortable with using the technology. However, because my department deals with technology, it is so especially important that teachers equip themselves now especially as changes are coming. Curriculum has digitised as most things can be accessed	(practice/perception)

	and taught online as well. ”	
4.In your experience as a member of the SMT, what role to do you play in ICT integration in the curriculum? Elaborate?	“Feel that we play a duty of responsibility role as we often divide our role in ICT between departmental heads”	(leadership/teamwork)
5.How do you as an SMT member encourage the integration of ICT at your school?	“Recommending training and to use it in teaching and learning.”	(training)
6.What methods or strategies do you and the teachers use to integrate ICT in the curriculum?	“Strategy is aligned with DBE as we receive the directives from the WCED however I feel we should have a policy that’s more applicable to our school with regards to ICT.”	(policy)
7.What is the role of the school management team	“When it comes to change, we function as a team by providing	(leadership/teamwork)

in curriculum change management?	support and training to all stakeholders."	
8.What challenges do you experiences an SMT member in the integration of ICT at your school for teaching and learning? 9.Has the integration of ICT at your school changed your school's culture? If yes, in what way?	"Lack of finances, especially during lockdown and pandemic." "Yes, it changes the way we do things."	(Challenge)
10. What are your individual experiences in using ICT.	"I love ICT and as a CAT teacher as well I have so much to show others."	(Perception)

SMT member 10 (Subject head) of School B		
Questions	**Answers**	**Analysis (Keywords)**
1.As a SMT member do you feel like you have a leadership role at your school? Elaborate.	"Yes, we definitely do as a team not as an individual"	(leadership/teamwork)

2.How does your role of the SMT"s impact on effective school leadership?	“Hmmm, not just mine but all staff and stakeholders play a role.”	(leadership/teamwork)
3.What is your view about ICT integration in the curriculum at your school? Do you think it is important or not? Elaborate?	“I feel that ICT integration caught us by surprise as it was something new in our curriculum and its important as most of these learners are so tech savvy.”	(perception)
4.In your experience as a member of the SMT, what role to do you play in ICT integration in the curriculum. Elaborate?	“Not much.”	(attitude)
5.How do you as an SMT member encourage the integration of ICT at your school?	“By recommending it in our subject as math”	(attitude/ perception)

6.What methods or strategies do you and the teachers use to integrate ICT in the curriculum?	“Strategy mandated by DBE.”	(policy)
7.What is the role of the school management team in curriculum change management?	“We believe that as change comes, we tackle them and manage it as a team.”	(leadership/teamwork)
8.What challenges do you experiences an SMT member in the integration of ICT at your school for teaching and learning? 9.Has the integration of ICT at your school changed your school’s culture? If yes, in what way?	“Not all learners have access to ICT devices.” “Yes, it has, we are now more digital.”	(Challenge)

10. What is your experiences in using ICT.	"It has been a real learning experience, never too old to learn"	(perception)

Focus group interview questions and discussion school B.

1. What in your words comes to mind when you think about ICT integration at your school?
    - (Subject head) ICT integration means to make use of technology devices, such as the internet and devices. We often use online quizzes and do research. (Knowledge)
    - (HOD) In our teaching and learning, we make use of emails, WhatsApp, google classroom as a method of teaching and learning especially during the pandemic. **(Practice)**
    - In Management I (principal) feel that it could, much more effectively as it was only during lockdown, we were forced to use it more especially MS Teams. **(Practice)**
    - (HOD) Based on various legislation regrading ICT it entails on how to use digital devices and a vast majority of information to be able to not only communicate it in our teaching and learning but also how we operate as SMT. **(Practice)**
    - (Deputy Principal) use of Technology to communicate. **(Perception)**
2. What knowledge do you possess in the integration of ICT into your curriculum?

- As for our school we are still in the process of integrating it into all our classrooms and curriculum. (Practice)
- As a staff we communicate using MS Teams and or WhatsApp. (practice)
- Staff has received training, so I would say that we have entry level knowledge on how to implement in our teaching and learning. (knowledge)

3. What are the factors that influence ICT practices in the curriculum?
    - External factors and finances or budgeting. (challenges)
    - Lack of equipment.
    - Eskom
4. How do you as members of SMT perceive your leadership role in ICT integration in the curriculum at your school?
    - We feel that as if we all as SMT are more encouraged to enforce more ICT technology in classes it will be more adequately used. (Perception)
5. Are you as the SMT in charge of ICT integration at your school or do you delegate responsibility of it to someone else at your school, or outsource it?
    - Mostly Ms A acts as a reference on the SMT as she oversees the ICT and her appointed ICT Champion which is a teacher. (leadership/teamwork)

6. What challenges do you as SMT experience in encouraging ICT integration in the curriculum at your schools? Also,
    - Lack of finances. (challenges)
7. What are the strategies would you suggest, that may/can be employed in managing ICT challenges?
    - Budgeting and allocating enough for ICT. (challenges)
    - Each one teaches one ensuring that the school is more ICT inclined. (Challenges)
8. Would you as SMT lead the way for the usage of ICT in your school? Why?
    - Yes, we all feel that ICT is the new way of life, and it is you beat which we cannot so we will join the wagon of the ICT change. (attitude/ beliefs)
9. What are SMT views on ICT integration?
    - That it is the future. (attitudes / beliefs)
10. How important is it for the SMT to ICT knowledgeable? Why?

It is especially important that all are skilled and trained to use it into their curriculum.

Appendix E – Editorial Letter

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24 October 2022

To whom it may concern,

RE: Letter of confirmation of language editing

I hereby confirm that I have edited (language, grammar, and flow) the paper: ***The role of School Management Teams (SMTs) in Information Communication Technology (ICT) integration in the curricula at public schools in Cape Town***, submitted by Tina Jane Oladokun Hendricks.

Kind regards,

Chenge Mutongwizo
BSocSc Honours in Organisational Psychology (UCT)

Figure 3: Editor Letter