THE INSTRUCTIONAL LEADERSHIP ROLE OF THE HEAD OF DEPARTMENT IN SOUTH AFRICAN PRIMARY SCHOOL CLASSROOMS IN ENHANCING THE USE OF TECHNOLOGY-BASED EDUCATION

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The exact wording of the title of the thesis as appearing on the electronic copy submitted for examination: **The instructional leadership role of the Head of Department in South African primary school classrooms to enhance the use of technology-based education**

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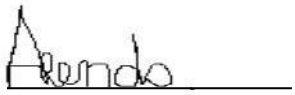

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ABSTRACT

The instructional leadership role of the Head of Department in selected South African primary school classrooms to enhance the use of technology-based education was the focus of this study. The research investigated the instructional leadership role that the Head of Department plays in supporting teachers in the use of technology in the teaching and learning process. A qualitative research approach with a case study design method was deemed most appropriate for the study. Data was collected from sampled teachers and Heads of Department of selected schools in Johannesburg South, South Africa. Participants completed a questionnaire with both closed and open-ended questions. Data analysis for this study was done based on the steps and suggestions for the grounded theory approach but it also incorporated the concept of content analysis.

The findings of the study linked to the literature revealed areas of strength and weakness concerning the instructional leadership role of the Head of Department as well as supporting teachers to enhance the use of technology within the classroom. Based on these findings, recommendations will be made to the School Management Team (SMT) to put forward intervention strategies that would assist both the school management teams, head of department and teachers to implement technology within the 21st century classroom.

Key Terms: Leadership, Instructional Leader, 21st Century Classroom, Technology, Head of Department, Professional Development, Technological Developments, ICT, Teachers, Global Citizen.

ACRONYMS

CaT	Curriculum and Technology
CAT	Computer Applications Technology
CPTD	Continuing Professional Teacher Development
DBE	Department of Basic Education
DHET	Department of Higher Education and Training
DoC	Department of Communication
DoE	Department of Education
ECD	Early Childhood Development
EMIS	Education Management and Information System
EU	European Union
GDE	Gauteng Department of Education
HoD	Head of Department
ICT	Information and Communications Technology
ICT4AD	ICT for Accelerated Development
ICT4RED	ICT for Rural Education Development
4IR	Fourth Industrial Revolution
IPET	Initial Professional Education of Teachers
INTO	Irish Teachers' National Organisation
IQM	Integrated Quality Management
IQMS	Integrated Quality Management System
IS	Information System
ISAD	Information Society and Development
ISTE	International Society for Technology in Education

IWB	Interactive Whiteboard
LSEN	Learners with Special Educational Needs
LTSM	Learner Teacher Support Material
MoE	Ministry of Education
NESA	NSW Education Standards Authority
NGO	Non-Governmental Organisation
NSW	New South Wales
ODL	Online Distance Learning
OECD	Organisation for Economic Co-operation and Development
PAM	Revised Personnel Administrative Measures
PD	Professional Development
PLC	Professional Learning Communities
PISA	International Student Assessment
PNC	Presidential National Commission
PTD	Professional Teacher Development
RNCS	Revised National Curriculum Statements
SACE	South African Council for Teachers
SDG	Sustainable Development Goal
SGB	School Governing Body
SMT	School Management Team
UNESCO	United Nations Educational, Scientific and Cultural Organization

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CHAPTER ONE

ORIENTATION OF THE STUDY

1.1 INTRODUCTION

Using computers in the classroom has become a major part of the teaching and learning process in many schools. Internet-enabled devices, such as touchpads, e-book readers and notebook computers, as well as advanced electronic devices such as mobile phones and iPods, mini-notepads, Google apps and cloud networks are all providing new and more effective ways to address the challenges the educational system is facing (Phill, Shyamlee & Solanki, 2012).

According to the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2012), education is regarded as one of the fundamental necessities for the development of nations. It is a long-term investment, but economists believe that when compared to any other sector in which resources are distributed, education delivers the highest returns. Primary education is considered essential for the development of human capital. Young minds are influenced at this stage to accept innovative ideas, be creative, learn to think critically and absorb knowledge to make educated judgements later in life. Primary education is also the largest sub-sector of any educational system and it provides a unique chance to contribute to societal development through educating the young (UNESCO, 2012). UNESCO continues to be at the forefront of activities aimed at redefining educational standards to meet the needs of a rapidly changing society, with a particular focus on innovative approaches to education that emphasise the importance of ICT and its applications, as well as adapting curricula following teacher skill training (Meenakshi, 2013).

As a result, education has come to mean more than simply educating a student to read, write and manipulate numbers. Education, according to the business dictionary, is the richness of knowledge gained by an individual after studying specific subjects or learning life lessons that help them grasp something. As previously stated, education necessitates some form of personal instruction or a written literary alternative. Years of research that include studies in several areas, have resulted in the most frequent forms of education. Eady and Lockyer (2013) state that technology,in whatever form used, is included in the teacher's toolbox as a resource for assisting

the teaching and learning process. Over the years, technology has evolved, with the diversity and accessibility of technology extending the teacher's toolbox and possibilities to apply it (Eady & Lockyer, 2013).

This study examines the function of the HoD in the role as an instructional leader, as well as influencing and supporting teachers in their use of technology in the classroom. Rather than merely being a manager or administrator, the function of the HoD has evolved as a learning expert and lifelong learner due to the use of technology in the teaching and learning process. In this research, a structured questionnaire was administered to thirty respondents in Gauteng primary schools to examine how HoDs fulfil their roles as instructional leaders in ensuring the effective implementation of quality practice. The goal of the research was to develop a strategic model for ensuring high-quality practice in the use of technology-based education in schools, based on a review of the research findings and personal experience as an HoD. Implementing the findings and recommendations, the researcher hopes that the role of the HoDs in ensuring quality practice at the school level is enhanced.

1.2 BACKGROUND TO THE STUDY

According to UNESCO (2013), technology has altered the globe in previously inconceivable ways. Computers, the internet and various electronic devices such as cell phones, iPhones, smartphones and tablets have become indispensable in daily life, transforming how information is gathered. These gadgets have grown in power and are found in a variety of sizes, ranging from those that sit on your desk to those that fit in the palm of your hand with easy connection to the internet (Eady & Lockyer, 2013). The way technology is integrated into the curriculum and managed by teachers has a significant impact on the resources and knowledge base available to both teachers and students. The position of the school's HoD in this process can be a key link of reliance and support for teachers in addressing issues and problems linked to the teaching and learning process, as well as instructional development, to assist teachers to do their jobs better (Ghavifekr & Ibrahim, 2014).

According to Hollow and Isaacs (2012) technology has been transforming teaching in schools, with interactive textbooks and educational games incorporated, resulting in online digital classrooms. Old educational ideas have given way to newer, more

inventive ideas about how students learn and gain knowledge as well as how teachers should instruct. Teaching and learning are now aided and enhanced by technology (Parvin & Salam, 2015). Technology aids and enriches the teaching and learning process by increasing learners' knowledge and abilities, encouraging cooperative and independent learning, and encouraging learners to move away from memorising facts and toward a process of knowledge creation (Imgbi & Madumere-Obike, 2012;Naicker, 2010; UNESCO, 2011). Computers have had a revolutionary impact on modern life and everything is centred around computers, with mobile phones allowingus to take pictures, download tunes, search the web and interact with people all over the world. The implementation of Information and Communication Technology (ICT) in the classroom has been a catalyst in inspiring teachers and learners to work in newways (Parvin & Salam, 2015).

Computer technology has had an enormous impact on the concept of schooling and students can now be more innovative in the learning process to attain better learning outcomes (Joseph, Martin, David & Ruto, 2014). Technology has become a component of the teaching and learning process and one of the resources that aids teachers in their work. Teachers have greater opportunities to employ technology equipment like computers, smartphones, 3D digital models, whiteboards and the internet because of the advances in technology over the last few decades and the rise in the variety and accessibility (Eady & Lockyer, 2013). Teachers thus could use computers to prepare courses, present lessons and employ technology in the classroom to replicate real-world practices and when students use technology to produce fresh content rather than receiving content created by teachers, they learn more (Eady & Lockyer, 2013). For example, learners can learn new topics in science through experimenting with simulations, viewing films, creating content to convey their thoughts on the subject and learners can see the text come alive with maps, 3D-digital models, films and linkages to definitions and more content, thanks to the use of technology (Darling-Hammond, Zielezinski & Goldman,*2*014).

Teaching in the digital age requires teachers to be equipped with specific teaching competencies such as cooperation, creativity and problem-solving, as well as characteristics such as tenacity, curiosity and taking the initiative to use technology to enhance both teaching and learning (World Economic Forum, 2015). These abilities

will raise teachers' knowledge of technology advancements to better their teaching, allowing them to seek out opportunities and giving them access to a variety of resources (World Economic Forum, 2015). In terms of 21st century teaching and learning, as well as the use of ICT as a 21st century leadership strategy, technology has the potential to increase educational opportunities and improve educational quality on a global scale (Botha, 2013).

Since it helps teachers to create meaningful learning experiences, technology is vital in education (Eady & Lockyer, 2013). The use of technology offers teachers the opportunity and benefits of creating meaningful learning experiences, such as using technology as an interactive tool for practising skills and creating updated content for themselves and their students. Multimedia content used in the design of worksheets, projects, reports, graphic representations of data and websites such as blogs, PowerPoint presentations, CD production, digital storytelling, e-books and e-learning are all examples of digital storytelling (Darling-Hammond *et al.,* 2014).

In addition, digital technology's transformation promotes creative learning techniques focused on 21st century skills such as creativity and invention, critical thinking and problem-solving abilities as well as decision-making abilities, life-long learning and cooperative skills, ICT literacy as well as civic awareness and personal and societal responsibility. Furthermore, the use of technology improves educational outcomes, incorporates innovation to keep pace with the digital economy and strengthens partnerships with non-education sectors to embrace informal learning (Digital Education, 2011).

Teaching and learning techniques must therefore be improved and teachers must take charge of their professional development (PD) and advocate for pedagogical change. Teachers need to learn and apply new skills such as creating digitally oriented classrooms, taking advantage of free online educational resources, participating in professional online services such as speech therapy, music coaching and assisting students with special needs, as well as providing options and pathways that would otherwise be unavailable. Technology allows teachers to stay abreast of educational trends, communicate and network by joining online communities to connect and collaborate with other educators (Wolfenden, 2015).

The role of the HoD is vital in supporting the use of ICT in the teaching and learning process aimed at achieving better learning goals using technology. The HoD's role includes collaborating with others, providing support, identifying, designing, and delivering professional learning programmes and assisting teachers in meeting their curriculum outcomes and professional learning goals (Darling-Hammond *et al.,* 2014). In addition, the HoD's responsibility is to assist teachers in producing, manipulating and sharing information about computers and networks by delivering activities at various levels and developing activities (Costley, 2014; Herron, 2010). The HoD encourages teachers to use technology to restructure and rethink their classes to foster higher-order thinking skills (Costley, 2014).

The HoD's responsibility is to ensure that teachers gain 21st century capabilities in understanding how ICT and pedagogy interact through ongoing professional development, such as workshops so that they can use it in their practice (Dede, Erstad, Mishra & Voogt, 2013). Information technology has an impact on all parts of human activity, including education and training, but it also has the potential to advance the teaching and learning process, particularly as the usage of technology increases (Du Toit, 2015). In addition to having a vision for leading and learning with technology, HoDs must be capable of gaining new perspectives and abilities in the field of technology as well as education. To improve school performance, HoDs, as instructional leaders, can have an impact on teacher motivation and capacity, as well as the climate and classroom environment in which they work and teach (Richardson, Flora & Bathon, 2013).

Technology has a lengthy history of development and advancement. Countries have made significant investments in ICT over the last two decades, and their use in education and training in the European Union (EU) and Organization for Economic Cooperation and Development (OECD) countries, but development has been haphazard. One of the crucial driving forces for economic growth is information and communication technology (ICT). The increased effectiveness and use of ICT in supporting the teaching and learning process across various subjects has altered the impact of ICT within the educational organisation (Aristovnik, 2012). ICT is regarded as one of the most essential driving engines in encouraging economic progress.

Millions of African students now have access to ICT due to its increasing availability. About 1.5 million learners in South Africa, for example, now have access to computer classrooms thanks to improved computer technology such as whiteboards and tablets (Rupp, 2013). Dlamini, Ford, Marais and Meyer (2017), on the other hand, recognise that implementing ICT in rural regions has proven difficult due to a lack of infrastructure, poverty, unemployment and social concerns. Dlamini *et al.,* (2017) state that a programme called ICT for Rural Education Development (ICT4RED) was launched in rural schools. ICT4RED was a large-scale initiative to bring technology to rural schools to enable evidence-based learning for policymakers and practitioners, this means using research from the ICT4RED programme to inform new policies or improve the effectiveness of the existing programme. According to Dlamini *et al.,* (2017), the integrating of technology at the school level was a success, but the project's sustainability owing to systematic factors was not. It is thus the HoD's role as an instructional leader to be efficient and effective when making decisions to improve the ICT implementation and sustainability in the school (Le Roux & Pretorius, 2016).

1.3 RATIONALE FOR THE STUDY

Understanding ICT is critical in the academic system, and several definitions are proposed. According to Meenakshi (2013:3), ICT is defined as:

> *A diverse set of technological tools and assets is used to communicate, create, disseminate, save and manipulate information. ICT infiltrates the industrial world, facilitates the development of innovative businesses, and provides an effective infrastructure for government, as well as adds value to the learning process.*

Butler (2015) defines ICT as a broad term used to classify several types of information. ICT can be defined as an Information System (IS), a group or collection of people, or behaviours. UNESCO (2012) defines information and communication technology (ICT) as a broad word that encompasses a wide range of computer-based instruments, resources, environments, methods and abilities for accessing, processing and transferring data. According to UNESCO, ICT in education should be considered from two perspectives: as a medium of information and as a medium of construction, with both sides being equally significant, despite the constructional side

being devalued. Thus, ICT in education can be defined as computer and internet connections utilising and communicating information for learning (Mikre, 2011).

Because learning is viewed as the most important aspect of education, school management needs to focus on building and maintaining conditions that are favourable to successful learning. As a result, the leadership of the HoD is critical in establishing direction and accepting responsibility for ensuring that learning occurs. HoDs must be more than just good managers; they must also be good leaders of schools as learning organisations. According to the Centre for Educational Research and Innovation CERI (2013), the HoD in the 21st century would need to have the following leadership qualities:

- Leadership that demonstrates and nurtures 21st century professionalism by participating in appropriate professional learning and fostering the conditions for others to do the same.

- Leadership that exhibits creativity encourages innovation and the development of people and focuses on changes in practice, structure and culture.

- Social and connected leadership that is sustained through participation in professional learning communities (PLCs) and networks.

- Collaborative leadership working together with a variety of non-formal partners, such as schools.

- Transformative learning leadership at various levels that requires decision-making and action. Leadership is crucial for 21st century learning because it influences the direction and outcomes of the learning process.

The HoD, as an instructional leader influence, is at the forefront in the use of technology in the classroom, working with teachers at improving the quality of instructional activities. In addition, the use of technology will improve learners' organisational skills, motivate and promote learners' autonomous learning and actively involve learners in the decision-making process (Brown, 2011).
Studies have demonstrated the importance of instructional leadership in the classroom and its impact on student academic success and teacher development (Hallinger,

2011; Jamal & Lim, 2016; Rahimi & Yusri, 2015; Zakaria, 2016). A review of the literature reveals that instructional leadership is still in need of attention (Aziz & Yusri, 2014; Azlin, Rasul, Wahab & Yusoff, 2013; Jemaah, 2009; Rahimi & Yusri, 2015). According to research based on the instructional model developed by Hallinger and Murphy (1985), instructional leadership practice among school leaders is low. The lack of knowledge of their function as instructional leaders is one of the barriers mentioned by Michael (2014) and this is participarly important, as schools are at the forefront of student development and the HoD is thus responsible for fulfilling the school's goals and vision.

The study was conducted to identify the instructional leadership skills the HoD would need as an instructional leader to effectively manage their departments and provide support to teachers on the use of ICT within their classrooms and then provide guidelines for HoDs' on the training required and as a result, to improve their skills in running their phase more effectively. It can also help teachers better understand the role of an HoD and how their practice can be improved by collaborating with them on ICT integration.

1.4 PRELIMINARY LITERATURE REVIEW

1.4.1 The Role of Technology in the Classroom and Education

Improvements in ICT in education may alter the role of teachers in incorporating ICT into the educational process. According to Mikre (2011), ICT can give teachers new abilities and innovative approaches to teaching. Technology can provide teachers with the ability to assess students' strengths and needs, as well as provide students with skills necessary for work and life in 21st century society, allowing them to develop competencies that go beyond the knowledge and skills measured in traditional achievement tests (Moeller & Reitzer, 2013). Even though technology has been integrated into the classroom to some extent, its sustained use in the teaching and learning process remains a challenge. Despite having access to technology and trained teachers, the use of technology in the classroom remains poor, which is attributed to the teacher's pedagogical beliefs.

1.4.2 The Function of the Teacher in Teaching and Learning Facilitation

Education is a field that is constantly evolving, and there is always something new to learn. Albion, Forkosh-Baruch, Peeraer and Tondeur (2015) stated that teachers would face unfamiliar problems in the 21st century because of the potential provided by ICT in the classroom. Teachers go through a professional teacher preparation program to learn about their job. However, in a subject that is continually evolving, it is not always practical for teachers to acquire everything through formal education. As a result, teacher professional development within the school is viewed as a means of bringing about change.

In preparation for implementation in the classroom, teachers' professional development should focus on developing technology competence and confidence (Dedovets, Figaro-Henry, Kamalodeen & Ramsawk-Jodha, 2017). According to Kamalodeen (2014), developing ICT competency requires a method that allows teachers to learn while experimenting with modern technologies in their classrooms. The teacher will gain confidence and become more active rather than passive because of this method. In addition, the mindset of teachers is a crucial factor in the use of technology in the classroom. Teachers must maintain a positive attitude to effectively use technology in the classroom as this could affect their teaching methods, practices and influence how they incorporate technology in the classroom (Moeller & Reitzer, 2013). The teacher must function as a learning catalyst, orchestrator and facilitator of activities that will provide students with memorable experiences (Blair, 2012).

The use of technology, is a critical starting point for improving instruction in primary schools (Blair, 2012). In the educational system, innovative technologies are continually introduced and applied and considered as a stimulant for not only for personal development but also for learning.The importance of the teacher's involvement in integrating technology into the classroom cannot be overstated. If teachers make the correct choices about their teaching methods, curricular objectives and student needs, integration can be successful. Teachers should be allowed to select the type of technology they want to employ when planning classes, as well as the use of a variety of approaches to reach diverse types of students and assess their learning in a variety of ways (Blair, 2012). The use of technology in schools is supported and directed by the HoD as an instructional leader.

1.4.3 The Role of the HoD in Teacher Support

The role of the HoD in providing the knowledge and skills needed to support teachers in the implementation of 21st century technology in enhancing the teaching and learning process and creating a technology-based classroom, is critical to the success of the use and efficiency of technology in 21st century classroom. The Employment of Educators Act, 64, governs the role of the HoD in South African schools (RSA, 1998). The work of the HoD, according to this Act, is dependent on the school's approaches, needs and includes, but is not limited to, administration, teaching, personnel, extracurricular and co-curricular activities and communication with parents. According to the Department of Education (DoE, 2000) the major responsibilities of the HoD are to oversee a subject or a phase, participate in the teaching and learning process, provide and coordinate guidance on the most recent ideas in topics, approaches, methodologies, procedures, evaluation and aids and effectively communicate them to staff members within their phase. This is confirmed by the South African Department of Basic Education's Personnel Administrative Measures (PAM) document, which stipulates that the HoDs' responsibilities include engaging in classroom teaching, being responsible for the department's effective functioning and organising relevant or related extra-curricular activities to ensure that the subject, learning area, or phase, as well as the learner's education, are properly promoted (DBE, 2016).

The HoD, according to iMfundo (2015), can be thought of as a teacher leader who can influence teachers to improve teaching and learning. As a result, the HoD is crucial in supporting and strengthening teachers' learning and professional development (Ghavifekr & Ibrahim, 2014). When it comes to resolving concerns and challenges relating to teaching and learning, HoDs are the main source of reliability and support for teachers. As a result, the HoD's role as an instructional leader must be considered, particularly as technology has evolved in the 21st century, and teaching and learning in schools has become more complicated and diverse. This has placed high demands on HoDs, such as asking them to develop instructional leadership skills to encourage successful teaching and learning, in addition to understanding school management and economics. Furthermore, issues about school leadership will always be linked to a student's achievement (Ghavifekr & Ibrahim, 2014).

1.5 PROBLEM STATEMENT

Technology and technical training for teachers are important not only in South African classrooms but in all formal and non-formal education environments around the world (Van den Berg, 2017). Saxena (2017) states that education is critical to societal development and is a necessary condition for an individual's social well-being. The ability to empower the nation in all aspects is dependent on the quality of education. According to Saxena (2017) and Meenakshi (2013). one way to increase students' knowledge is through technology. ICT can improve education by raising learner motivation and interest, assisting in the learning and development of basic skills, improving teacher training and transitioning from a teacher-centred to a learner-centred approach. Instructional leadership is important as it focuses on effective leadership practices to make a difference in the teaching and learning process.

The focus of this study was to identify the leadership skills the HoD would need as an instructional leader to effectively manage their departments and provide support to teachers on the use of ICT within their classrooms. It is important to consider how this would contribute and lay the foundations for further research on the use of technology within the classroom and the role of the HoD within this process. In addition, this study aimed at providing guidelines for HoDs on the training required and as a result, to improve their skills in running their phase more effectively. It can also help teachers better understand the role of an HoD and how their practice can be improved by collaborating on ICT integration.

1.6 RESEARCH QUESTIONS

The research question for this study is: **What is the instructional leadership role of the HoD in South African primary school classrooms in enhancing the use of technology-based education?**

This study aimed to provide answers to the following research questions based on the research objectives:

- What is the concept of the 21st century classroom?

- How can the HoD contribute to the effectiveness and improve the use of technology in the 21st century classroom?
- What is the role of the HoD in designing, implementing, and maintaining an effective technology model for the 21st century classroom?
- Which instructional leadership skills does the HoD, as an instructional leader, need to effectively lead teams and teachers?
- What strategy model could be implemented by the HoD to enhance the use of technology within the 21st century classroom?

1.7 AIM AND OBJECTIVES OF THE STUDY

This research aims to investigate the role of the HoD as an instructional leader in enhancing the use of technology-based teaching in South African primary schools. The objectives of this study are to:

- Explain the concept of the 21st century classroom (Chapter 2)
- Explain how the HoD can contribute to the effectiveness and improvement of the use of technology within the 21st century classroom (Chapter 3).
- Describe the role of the HoD in designing, implementing, and maintaining an effective technology model for the 21st century classroom (Chapter 3).
- Outline the 21st century leadership skills the HoD needs to effectively lead teams and teachers (Chapter 2).
- Present a strategy model that could be implemented by the HoD to enhance the use of technology within the 21st century classroom (Chapter 6).

1.8 RESEARCH METHODOLOGY

Research methodology refers to the process of gathering and analysing data. Systematic and reliable techniques in conjunction with a valid and deliberate strategy can be used (McMillan & Schumacher, 2010).

1.8.1 The Research Paradigm

A research paradigm is a basic belief system or worldview that influences a researcher's epistemology, ontology and research methodology choices (Elshafie, 2013). The theory of knowledge, called epistemology, asks, what is the nature of the

interaction between the knower and the known? Ontology is the study of the nature of reality and is concerned with questions such as: What can be known? What is the nature of reality? *The* strategy or plan of action influencing the choice of methods is known as research methodology and it also poses the question, How might the inquirer go about finding the known? (Elshafie, 2013:4).

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This study investigates the instructional leadership role of the HoD in South African primary school classrooms using technology in enhancing education within a hermeneutics interpretive paradigm. Hermeneutics is a philosophy that views life as a process of interpretation and discussion, to clarify or explain things. It is also known as the science of understanding through communication and the transfer of meaning from one person to the next. Hermeneutics is what we do when we interact and communicate with other people or objects. Although hermeneutics allows for subjectivity by allowing for personal feelings to impact interpretation, this does not imply that we abandon our quest for truth. Hermeneutics believes that the entire reason we interact and strive to understand is to find truth (Higgs & Smith, 2006).

1.8.2 The Research Approach

Because it considers people's motivations, feelings, prejudices and incidences of interpersonal cooperation and conflict, this study took a qualitative research approach (Gray, 2014). Understanding aspects of life by generating narrative or observational data to answer questions like *what*, *why,* and *how,* a qualitative approach investigates people's attitudes, behaviours, meanings and interpretations of events and occurrences, as well as product descriptions and analyses based on these viewpoints (Creswell, 2014; Johnson & Rasulova, 2016). Qualitative research, according to

Johnson and Rasulova (2016), is based on no single truth or reality, and the phenomena are dependent on our perceptions and understandings of them, with reality being relative and shaped by our interpretations of it, rather than being distinct or objectively verifiable (Sandelowski, 1986).

This research is exploratory, to learn more about a little-studied subject: the role of an HoD in supporting teachers' use of technology to improve the teaching and learning process in primary schools. The study approach provided answers to the research questions and investigated the practices that would determine teachers' use of technology and the HoDs' ability to improve teaching using technology. To understandsuch a phenomenon, a qualitative research approach poses a well-defined problem and collects and analyses data from a small sample of the study population (Creswell, 2012).

1.8.3 The Research Design

Qualitative case studies are used by researchers in studying the phenomenon in a specific situation using various data sources and lenses to reveal various aspects of the phenomenon (Rashid, Rashid, Sabir, Warraich & Waseem, 2019). According to Cohen, Manion and Morrison (2018) and Yin (2014), a case study is an in-depth, analytical research approach that focuses on describing, analysing and interpreting a specific instance or phenomenon in its real-life setting. This case study offers a one-of-a-kind example of actual people in real settings, with the goal of better understanding people's perspectives (Cohen *et al.,* 2018). These descriptions correspond to the study's focus on the role of the HoD in enhancing teaching and learning using ICT.

1.8.4 The Population and Sample of the Study

1.8.4.1 Population for the study

Brink, Van der Walt and Van Rensburg (2021) define a population as a group of people or objects who meet the criteria for studies that researchers are interested in pursuing. The population of the study included primary school teachers and HoDs working in schools in the Johannesburg South District. It is from this population that the sample for the study was selected.

1.8.4.2 Sampling

Instead of random sampling, a non-probability sampling method was used in the study, which is the most common method used in qualitative research investigations. Purposive sampling is a technique widely used in qualitative research to identify and select participants, particularly to collect data that is relevant to their research questions, goals and objectives and obtain adequate information due to their knowledge or experience with the phenomenon under study (Duan *et al*., 2015). Purpose sampling seeks out individuals, groups and environments where the process under investigation is most likely to occur (Tracy, 2013). The research used purposive sampling to select people who best represent or are knowledgeable about theresearch topic (Clark, Creswell & Plano, 2011).

The sample for the study was 30 participants (n=6x5=30). This means that the study included teachers and HoDs from six public primary schools. Purposive sampling was used to select the sample as these participants were assumed to be teachers and HoDs in information-rich schools who were knowledgeable about the phenomenon under investigation (Macmillan & Schumacher, 2006). This sample selected represents urban schools in the study and provides teacher and HoD perspectives on the use of ICT in the classroom (Afshari, Gavifekr, Samad & Siraj, 2012).

1.8.5 Data Collection Instruments

The process of gathering information in response to questions is known as data collecting. Questions, interviews, open-ended questionnaires, document analysis and first-hand observation were used to gather information. A qualitative questionnaire was utilised in the study to gather information about the participants' experiences with technology and the role of the HoD in this process. Questionnaires might be the easiest and cost-effective way to gather information used to collect quantitative or qualitative data and are the most straightforward method for reducing interviewer bias because no verbal or visual cues are available to influence participants. The credibility of the findings increases when information from multiple sources is merged to see if the findings are consistent (Creswell, 2014).

The questionnaire was compiled with open-ended and closed-ended questions structured so that participants could answer yes or no questions as well as provide their in-depth answers based on the questions. This meant that the questionnaire was designed in such a way that participants would be able to express their opinions without being swayed, allowing for a more in-depth response. All participants completed the same questionnaire to maintain uniformity. Participants' responses assisted the researcher in understanding what they believe about the questions asked, which were useful in in determining the technical capabilities needed by teachers as well as the leadership abilities needed by HoDs' to effectively lead teachers in the usage of technology and the findings could thus influence changes in technology use in the school.

1.8.6 Data Analysis and Presentation

Data analysis is a technique for determining underlying patterns, trends, and the relationship between variables in the context of a study (Albers, 2017). This study applied a process of data analysis based on a basic approach to theory analysis, as this is particularly relevant to the human services sector, including education and training (Botha, 2013). The researchers can find and discover general claims regarding data categories and produce process theory and conceptual analyses of social worlds (Botha, 2013). Basic theory can be described as the comparative analysis approach and contains several processes in the analysis. These steps include reading a text sample, coding, discovery of patterns, identification and forming of descriptive categories, comparisons and connections of similar and different categories, groupings or clusters, the re-examination of category-based data, the interpretation of and in some cases, theory foundation (Botha, 2013). For this study, the data analysis was conducted based on the basic theory approach stages and suggestions. A more in-depth discussion of data analysis is provided in Chapter 4.

1.9 TRUSTWORTHINESS IN THIS STUDY

According to Creswell (2012), triangulation is widely considered as a process that uses multiple perceptions to clarify meaning and verify the repeatability of observations or interpretations. There are different types of triangulation. Triangulation of data collection methods which refers to the interpretation of findings from both focus group

interviews and open-ended questionnaires was used in this study. This helped the verification and validation of the findings. According to Setati (2011) the value of triangulation is its ability to confirm the validity of the findings obtained from various approaches and theoretical lenses. Thereby, ensuring that the researcher's subjectivity is eliminated through cross-validation methods.

In qualitative research, the researcher acts as a data collector. To represent and communicate the accuracy of research procedures and the trustworthiness of research findings, norms such as credibility, transferability, dependability, and confirmability must be addressed (McMillan & Schumacher, 2010). The fourth chapter delves deeply into these trustworthiness standards. Trustworthiness within this study was assured by having confidence in the research findings by eliminating bias because of interpretive designs. Yilmaz (2013) states that the trustworthiness of the study can be enhanced by ensuring credibility and confirmability.

1.10 ETHICAL CONSIDERATIONS

This study adhered to the University's ethics policy standards, which may be found at http://cm.unisa.ac.za/contents/departments/res policies/docs/Research Ethics Policy approval on 21 Sep07.pdf, as well as individual privacy rights, as stated in the ethical clearance certificate. An application for ethical clearance from the university was made (Cohen *et al.,* 2018; Creswell, 2009; De Vos, Fouché, Strydom & Delport, 2011) and ethical clearance was granted (45915156/19/AM)

Permission for access to the schools was applied for and granted by the Gauteng Provincial Department. In addition, permission was requested from the identified schools and the participants were invited to participate in the research. All the participants as adults agreed to participate in the study, were fully informed about the study and were briefed on anonymity and confidentiality. Participants were made aware of their freedom to participate and withdraw at any time. In Chapter 4, the ethical considerations are discussed in greater depth.

1.11 CONTRIBUTION OF THE STUDY

The purpose of this research was to investigate the practices that determine a HoDs' leadership skills in strengthening teaching with technology in Gauteng Primary

Schools in South Africa. This study's goal was exploratory, as it investigated a field of research, namely the role of the HoD as instructional leader in enhancing teaching and learning with technology in Gauteng Primary Schools in South Africa. While this is a basic study, the findings or conclusions are used to make more realistic decisionsabout the effectiveness and improvement of technology used by public primary school teachers. The contribution to both theory and practice could be used to demonstrate what it is like to research the real world. It could also indicate links between the problem, the intervention and the outcome.

Using theory, the researcher may be able to make sense of the complex relationships that underpin the use of ICT in schools. When it comes to implementing ICT in the classroom, the HoD plays a crucial role (Wang, 2015). A major contribution of this study would be to gain a better understanding of its role as an instructional leader, as well as how it affects classroom teaching and learning.

1.12 AREA OF RESEARCH DEMARCATION

When conducting research, some variables are beyond the study's control. There is a demarcation process that allows the researcher to limit the scope of the data included in the study. Because of the demarcation, the researcher was able to focus on the research issue, making it easier to manage the investigation within its parameters. Because the researcher lives and works in the Johannesburg South District, the research was limited to public primary schools situated in the Johannesburg South District.

1.13 DEFINITION OF KEY CONCEPTS

To gain a better understanding of the context, it is necessary to define and comprehend key phrases used in this study. These keywords appear throughout the thesis and are defined below.

1.13.1 Technology

Technology is a branch of science that studies the invention and application of technological means, as well as their interactions with life, society and the environment. It incorporates elements from industrial arts, engineering, applied

science and pure science (Technology, 2017). It can also refer to electronic devices, network infrastructure or applications such as software, online resources, digital tools, social media and emails. This study discussed the value of 21st century technology in teaching and learning, as well as its significance for both teacher and student enrichment. According to Slyter (2019), it is the use of technology to solve large-scale business or organisational problems. Having stated that, technology is a method that allows one access to information quickly and easily from all around the world in real-time.

1.13.2 Primary Education

Primary education is the largest sub-sector of any educational system and provides a unique chance to contribute to societal reform through the education of children (UNESCO, 2012). According to Ahmed *et al*., (2014), education is crucial in the development of human capital. The quality of a country's human resources is determined by its educational system. In developing countries, primary education is seen as one of the most important vehicles for encouraging economic growth and raising living conditions (Ruff, 2016). This research is linked to the fact that primary education is seen as the most crucial for enriching human capital since it involves the use of technology by teachers and the leadership role of the HoD in implementing the use of technology within a primary school. Young minds are influenced at this stage to accept innovative ideas, be creative, learn to think critically and absorb information from their surroundings to make informed decisions throughout their lives. Primary education is also the most important subsector of any educational system and it provides a unique chance to contribute to societal transformation by educating the young and utilising technology to improve the teaching and learning process (UNESCO, 2012). The act of learning can be viewed in this light. Primary education is specifically for younger children who are taught the fundamentals of reading, writing, and mathematics, as well as an understanding of other subjects.

1.13.3 Leadership Skills for the 21st Century

Leadership skills for the 21st century are linked to the importance of technology in educating students for 21st century jobs, global citizenship and finding solutions that will interest students and help them become lifelong learners (Davidson, 2014).

According to Grant, Knights and Young (2020), in an ever-changing world, leaders who are more self-aware, emotionally intelligent and able to use a variety of leadership styles for different situations. Individuals become leaders through a process of challenging work, dedication and experience. Leadership is the process by which one person guides others in a specific direction. It is a process that must be earned rather than given. It is a process that necessitates self-assurance and confidence. Where you must know what to do, what is best for your team and where you must set a good example.

1.13.4 Head of Department

The role of providing leadership in specific subjects, departments and stages fall to the Head of Department (HoD) (DoE, 2000). The HoD is also in charge of curriculum development, monitoring and ensuring that high-quality teaching and learning is delivered (Ali & Botha, 2006). The HoD is also in charge of policy creation, translation and implementation at the institution. The HoDs' role in ICT is to integrate it into all subjects, enhancing the teaching and learning process using technology (Wang, 2015).

1.13.5 Teaching and Learning in the 21st Century

Teaching and learning in the 21st century are based on the integration of technology and are centred on student-centred education, in which students are given the freedom to select what, how and when they learn as well as judge their progress. Learners can obtain information from a variety of sources and the usage of ICT is critical in this process. The typical classroom has evolved into one in which students participate in conversations as well as project-based learning, putting them in the role of active researchers. Communication has improved and becomes more rapid because of the use of ICT, as well as the ability to present ideas more effectively and in a relevant manner. The research focused on topics connected to 21st century teaching and learning, as well as their value for teachers' and students' growth (Bhattachrjee & Dee, 2016).

1.13.6 Role of Instructional Leadership

Instructional leadership is a type of educational leadership that focuses on a school's primary tasks, such as teaching and learning, defining the school's vision, mission, and goals, administering the instructional program and promoting the school culture (Manaseh, 2016). It refers to a worldview that incorporates a moral purpose that promotes student learning, professional inquiry, trusting relationships and evidence-based decision-making (Timperley, 2011). Instructional leadership, according to Sim (2011) is leadership that directly focuses on guiding teachers on curriculum and methodology.

1.14 CHAPTER OUTLINE

There are six chapters in this research study:

CHAPTER ONE

This chapter contained the introduction by emphasising the setting and detailing the background. It described the problem as well as the research questions and objectives. The research strategy and technique were explained briefly in this chapter but will be developed in Chapter 4. The goal of the study, its contributions to current knowledge and definitions of concepts and terms utilised in the study were all introduced in this chapter.

CHAPTER TWO

Chapter 2 focusses on concept of leadership, as well as leadership within the school context. The chapter also discusses the concept of instructional leadership and the role of the HoD as an instructional leader were also covered in this chapter. It also addresses the topic of technology-based education within the 21st century classroom, as well as the leadership styles and skills that the HoD would require in order to successfully integrate technology-based education within primary schools.

CHAPTER THREE

Chapter 3 discusses the function of ICT in the educational context, as well as the role of ICT in classroom instruction and the development of digital citizen skills. It also

explores teacher education, with a focus on ICT access in teacher education. The chapter also looks at the e-Education White Paper, a feasibility study for an e-Education initiative in South Africa, and a National e-Education implementation strategy in the context of ICT policy development in the educational setting. In addition to South Africa, the chapter explores policies and practises that encourage the use of ICT in education in a few other nations. The chapter concludes with a discussion of ICT resources and functions in primary schools in South Africa.

CHAPTER FOUR

This chapter explains the research methodology, as well as the research technique, which includes sampling, data sources, methods of data collection, methods of data analysis and ethical consideration. The study uses qualitative data-gathering tools such as questionnaires and document analysis to collect pertinent information for the problem under the study.

CHAPTER FIVE

This chapter presents the research results and a discussion of the results. The qualitative data collected through the questionnaire and document analysis are discussed.

CHAPTER SIX

This chapter provides a summary of the findings, recommendations and limitations of the present study. The major findings gained from the data are discussed, summarised, conclusions are presented and the possible solutions to the problems under the study are offered.

1.15 CONCLUSION

The overview of the thesis is discussed in this chapter to help the reader understand the focus of the research. The theoretical framework used in this research is Senge's shared vision leadership model, to determine what leadership traits may improve instruction on the use of ICT in the school. This framework is used in this study to help HoDs strengthen their capacity to focus on the teaching and learning process, improve

achievement and create an effective school. It is also beneficial for teachers to share leadership roles and other school activities to complete tasks collaboratively. To obtain sufficient information to reach relevant conclusions, The chapter introduced the qualitative research approach used in the study as well as research and design, sampling techniques and data collection instruments and the data analysis technique used. A brief overview of methodological norms and ethical considerations was presented and the chapter ended with concept clarification.

The theoretical framework is discussed in the following chapter. This chapter discusses leadership theories, leadership in the school context, the concept of instructional leadership, the HoDs leadership styles, the HoDs role as an instructional leader and middle management. It also discusses the integration of technology in 21st century education, the benefits of integrating technology in education, the challenges of integrating technology in education and the instructional leadership role of the HoD in this process.

CHAPTER TWO

SCHOOL LEADERSHIP IN THE USE OF TECHNOLOGY

2.1 INTRODUCTION

In the earlier chapter, the researcher focused attention on the key aspects that have formed the background to this study. Chapter two highlights what other scholars have learned about the subject. According to Watson and Xiao (2017), studying relevant literature can help us to decide the breadth and depth of the existing body of work and to find gaps that need to be addressed; a literature review serves several important purposes, including how to avoid merely repeating earlier work, why there is a need for further research, and how the researcher's horizons may be widened.

The literature review in this chapter has contributed to the building of a body of knowledge on the research issue. It was needed because it allowed the researcher to elicit insights into the instructional role of the Heads of Departments (HoDs) in improving the use of technology in the classroom. The study was therefore limited to the context and boundaries connected with the HoDs' involvement in the literature. This chapter focuses on the use of Information Communication Technology (ICT) by HoDs to promote teaching and learning, and pertinent leadership literature about the role of the HoD in this process will be included.

This chapter will cover leadership aspects, such as leadership in the school environment, the concept of instructional leadership, the leadership styles of HoDs, the functions of the HoD as an instructional leader, and the role of the HoD in middle management. It will also discuss the benefits of integrating technology into education, the challenges of integrating technology into education, and the HoD's position as an instructional leader in this process.

2.2 LEADERSHIP IN THE SCHOOL CONTEXT

2.2.1 Introduction

The concept of leadership in the school context is popular because it implies dynamism and proactivity. The principal is commonly thought to be the school leader,

but this may not always be the case. School leadership may include other individuals, such as members of a leadership team and others who contribute to the school's goal.

The term leadership can mean a variety of things. There is no acknowledged definition of leadership, according to Leithwood, Jantzi and Steinbach (1999). According to Yuki (2002), there is no such thing as a perfect definition, but, according to Beare, Caldwell, and Millikan (1989:99), there should at least be a working definition:

> *Outstanding leadership has invariably appeared as a key characteristic of outstanding schools. There can be no doubt that those seeking quality in education must ensure its presence, and that the development of future leaders must be prioritized.*

The rationale for discussing school leaders is that they all have responsibility to understand the art of school leadership in the twenty-first century, whether they are aspiring principals, deputy principals, team leaders, or heads of departments. Leadership is a process of influence that leads to the achievement of desired goals, according to Bush (2014):

> *Based on their personal and professional principles, successful leaders create a vision for their institutions. They convey their vision at every opportunity and persuade their employees and other stakeholders to share it as well.*

The school's philosophy, institutions, and activities are all focused on achieving this common goal. Based on this definition, three aspects of leadership will be discussed further.

2.2 THE ASPECTS OF LEADERSHIP

2.2.1 The Process of Influence in Leadership

The process of influence is central to many definitions of leadership. According to Leithwood *et al.,* (1999:6), *influence is a necessary part of most leadership concepts.* According to Bush (2014), there are three aspects to this process. The first aspect is that influence, rather than authority, is central to leadership. Both influence and authority are, however, dimensions of leadership. Influence is usually found in formal positions such as those of principals, deputy principals, and HoDs, but influence may

be exercised by anyone in the school. Second, the process of influence is intentional, implying that the person looking to exercise influence is doing so with specific goals in mind. The third aspect is that influence can be exercised by both groups and individuals. According to Northouse (2016), leadership entails influence, and leadership does not exist without influence. The leader must be able to persuade his or her followers to work together to achieve a common goal, as a leader cannot achieve a goal without the aid of the group.

2.2.1.1 Leadership and values

According to Bush (2014), the concept of influence is agnostic and does not explain or recommend what goals or actions should be pursued. He asserts, however, that leadership is linked with values and that leaders are expected to base their actions on clear and professional values. Bush (2014) goes on to say those good leaders are informed by and communicate clear sets of personal and educational values that are their moral purpose for the school, and this implies that values are chosen. Johnson (2012:7) asserts that *it is impossible to be a leader without values*. Individuals' attitudes and actions are influenced by their values (Baloglu, 2012). Leaders implement these values because they strengthen their ability to influence, supply clarity, reduce stress, and guide decision-making and actions (Eikenberry, 2012).

2.2.1.2 Leadership and vision

Vision is becoming more widely recognized as an essential part of leadership. According to Bush (2014), vision is an essential part of effective leadership. Bush (2014) states that vision building is a highly sophisticated, dynamic process that few organizations can sustain. The expression of an unobstructed vision has the potential to develop schools, but the empirical evidence of its efficacy is mixed.

2.2.2 The Concept of Leadership

Leadership theories, according to Northouse (2016), have evolved in response to changes in the sociocultural, economic, and political environments. *Leadership is the process by which an individual may influence a group of people to achieve a common goal,* according to (Northouse, 2016:6). According to Ganta and Manukonda (2014), leadership is also a type of power in which one person can influence or change another person's values, beliefs, behaviour, and attitudes. Different researchers define

leadership in many ways. According to Harvey, Hill, and Landis (2014), leaders are critical to the success of any business because they can achieve goals by using available resources (human and material), while maintaining a consistent and coherent organization. According to them, as we enter the twenty-first century, leadership has evolved to become more visible and reflective of real-world realities (Harvey *et a*l., 2014).

Leadership can also be defined as the process of persuading others to collaborate towards a common goal. According to Silva (2016), leadership is a difficult concept to define, and the search for a definition may be fruitless because the definition of leadership is dependent on the researcher's interests and the type of problem under investigation (McCleskey, 2014). Defining the concept of leadership is, however, one of the most used terms in human activity, including the military, commerce, politics, religion, and sport. A leader is more than just a personality trait. Leadership must include its followers and context, both of which are important in defining it. Despite the literature proving that leadership has evolved and is regarded as a personal quality, many researchers have avoided defining it. Silva (2016:3) defines leadership as the acceptance of someone as a group's leader in order to achieve common goals. Leadership is more than a value; leaders promote actions that produce or lead to a specific result.

Leaders are developed, not born, according to research by Amanchukwu, Stanley, and Oloube (2015). While this is true, being an effective leader needs a diverse set of abilities, including the ability to negotiate and collaborate with others to reach a common goal. Leadership is developed through a combination of self-study, education, training, and the accumulation of relevant experience, rather than just through books or lectures.

According to the definition of leadership, there should be more than one person with power and influence. According to De Vries (2014)., leaders are defined by what they do, how they do it, and why they do it Leading an organization is one of the most crucial factors in deciding whether it succeeds or fails (Al Khajeh, 2018). According to Al Khajeh (2018), the role of leaders also includes setting goals and proving aims, aswell as directing and coordinating the organization's impacts and activities. Dalglish, Dubrin, and Miller (2006:39) state that *leaders influence others to willingly try group*

goals by openly encouraging the actions of individuals or groups of people to achieve their goals by doing the right thing.

Similarly, Christie (2010:695) defines leadership *as a formal or informal influence relationship*. Smith (2016) states that leadership is a dynamic and ever-changing process. In addition, Cezmi and Toprak (2014) state that leadership refers to efforts directed towards achieving a common goal within an organization.

Leadership, whether in the private or public sector, is defined by a few theories. All types of organizations value leadership. Collaborating with others to achieve a common goal, sharing ideas, and supplying opportunities for effective leadership are all ways to add value to this service. HoDs can take advantage of these opportunities to develop their leadership skills. Although the definitions supplied above are helpful, leadership entails more than that; it entails allowing everyone to lead and, in the educational context, supplying opportunities for teachers to develop the skills necessary to lead and manage others. Being a leader entails, not only fitting into various theories of what leadership is, but also having the qualities and characteristics required to be a good leader (Amponsah & Mensah, 2016).

2.2.3 Leadership in the School Context

The concept of leadership in schools differs from the concept of general leadership (Frost, 2012; Harris & Muijs, 2006). Leadership is widely regarded as a worthwhile method of improving schools by utilizing HoDs' underutilized potential as change agents capable of promoting and enabling change within a group or organization.
All school stakeholders must be involved in school improvement. All teachers in the school could influence the school outside of their classrooms, if there were a transfer of leadership roles and decision-making authority from the principal to the teacher (Botha, 2016; Elmore, 2014; Triegaardt, 2013). The leadership of a school is defined as a set of cultural ideals that pervade the entire organization and are meant to guide individual members' daily behaviour (Kamara, Pitre & Sherif, 2016). Leadership, according to studies and reports, is a crucial factor in school effectiveness, as well as the key to organizational success and improvement (Earley & Weindling, 2004). A variety of styles can be selected and tailored to the situation (Amanchukwu *et a*l., 2015). Performance-related functions are critical to the school's collaborative process.

According to Van Wart (2011), the ability of the HoD as a leader is to implement performance-enhancing programmes, such as meeting goals, making decisions, meeting people's expectations, assessing their performance, driving others toward future aims, and supplying opportunities for growth for all. Similarly, Amponsah and Mensah (2016) state that leadership is the ability to persuade others to understand and agree on what needs to be done, how to conduct it, and how to aid independent, collaborative efforts to achieve agreed-upon goals.

HoDs can influence the school curriculum in ways that directly and indirectly affect the performance of both other teachers and their students to create an environment that values learning and fosters achievement. The success of daily teaching and learning activities is decided by the quality of education and teaching. HoDs must be exposed to leadership characteristics, such as flexibility and understanding that not everything will develop if one tries to do it on one's own, the tenacity not to succumb to pressure, and the patience to fight until they can win. Furthermore, they need to have humility and the kind of presence that will encourage others to communicate with them and respect them. Finally, to develop and sustain their instructional skills, they must accept blame when necessary and should be prepared to share any accolades with others. The HoD has the most direct impact on individual teachers, and he or she needs to have this level of leadership. Sullivan and Associates (2013) define school leadership as a combination of school-related knowledge, skills, and attitudes that allow for effective learning in the classroom.

A leader must be able to communicate with and influence others, according to Day *et al.* (2014) and Van Wart (2011), and this needs the application of diverse types of knowledge, such as problem-solving, planning, and implementation, the construction of solutions, the evaluation of solutions, social judgment, and a logical thinking process. This is intended to be a method for HoDs to lead in a school setting. According to research, leadership in schools is about aiding HoDs in developing leadership skills while also allowing them to put those skills into practice.

While the role of leaders differs across the globe and cultures, they all share common knowledge, attitudes, and beliefs (Davidson, 2014). The discussion that follows will, however, focus on the concept of instructional leadership.

2.2.4 The Concept of Instructional Leadership

The section that follows focuses on the concept of instructional leadership because it will aid in dealing with a specific type of leadership. The goal of this study is to supply an answer to the research question about the role of the HoDs as instructional leaders in South African primary schools. This section starts with an understanding of what instructional leadership entails, followed by an examination of how the HoD fits into that structure.

Tefera (2019:3) defines instructional leadership as *actions that a leader takes or delegates to others to improve the learning experience of others*. When the instructional leader prioritizes instruction, the vision and mission of the school are also realized. Teaching and learning are also emphasized, as is the behaviour of teachers who work with students. According to Armstrong *et al.* (2011), the HoD manages curriculum coverage and teaching in school as an instructional leader. Masuku (2011) agrees, stating that a teacher's responsibility is to increase the quality of classroom work to improve students' academic achievement, their attitudes, and their behaviour towards fellow students and their teachers, as well as to improve their personal lives. According to Bush (2014), instructional leadership models emphasize the importance of an HoD's role in supporting teaching and learning, defining a mission, and managing the curriculum and its instruction. These are the primary responsibilities of HoDs in schools. As a result, the concept has been discussed in a variety of contexts. To understand what instructional leadership as a concept entail, it is necessary to separate the concepts of instruction and leadership.

Instruction, according to Kruger (1995:43),

> *is concerned with the choice and arrangement of learning content, the setting of goals and aims, the sharing of knowledge, the transfer of skills, attitudes, as well as the provision of feedback to learners about their learning.*

Similarly, Elby *et al.* (2014) define instruction as the transfer of knowledge, skills, techniques, and abilities.

A leader, on the other hand, is someone who has delegated authority and persuades others to achieve specific goals (Nanjundeswaraswamy & Swamy, 2014). Putting these ideas together, instructional leadership is the transfer of knowledge, skills,

techniques, and abilities by a person who can delegate and influence others to conduct specific goals.

Instructional leadership is dependent on meeting the requirements of the new millennium, as Mestry, Moonsammy-Koopasammy, and Schmidt (2013) discovered; it helps leaders to develop clear visions, to promote a positive learning environment, to support teachers' learning, and to develop classroom-based strategies to create teaching and learning that meets the new millennium's curricula. Similarly, by emphasizing academic ideas, such as involving teachers in decision-making, supplying resources, supervising, and supplying instructional time, the HoD can affect school culture (Tshabalala, 2015). HoDs must have an unobstructed vision of how to improve performance by combining various skills. Using effective leadership methods, it is possible to increase teaching and learning.

The role of the HoD as an instructional leader is critical in the leadership process. This is pertinent to the study since the HoD's role as an instructional leader is regarded to be crucial in ensuring effective teaching and learning. To excel in this context, HoDs must have a thorough understanding of their role as instructional leaders, as well as the implications for teaching and learning. They should have the abilities and attributes necessary to empower and develop their departments in the pursuit of better teaching and learning.

The discussion that follows will centre on the leadership styles that the HoD can employ while also serving as an instructional leader in the school.

2.2.5 Leadership Styles

2.2.5.1 Introduction

Leadership is regarded as an essential part of the directing process. Managers must guide and lead various activities to get things done by others. Leadership is also defined as the ability to persuade others (Nazim & Mahmood, 2016). As instructional leaders, HoDs may employ a variety of leadership styles. According to Dold and Reid (2018), transformational and transactional leadership are two of the leadership styles that the HoD could employ. The two major aspects of leadership are transformational and transactional leadership styles.

Transformational leadership focuses on bringing to light people's innermost needs and ideals, resulting in both personal and organizational transformation. This means that executives encourage others within the company to improve and collaborate to make things better (Burns, 2003). Transactional leadership, on the other hand, entails the subordinate and the leader making transactions in which the leader rewards the subordinate when the organization achieves its goals and aims. This is not to argue that one style is better than the other; rather, they can be employed together to create greater or interacting results (Andersen *et al.,* 2016).

2.2.5.2 The transformational leadership style

Change is central to transformational leadership, as is the leader's role in envisioning and achieving organizational performance improvement. Transformational leaders, according to Bantwini and Mooroshi (2016), excite and inspire their followers by sharing a common vision and involving them in decision-making. This type of leadership style is defined by the ability to persuade others to want to change, improve, and be led. According to Menon (2014), the leader and followers in this leadership are devoted to the organization's vision, as well as its values, which are focused on a single goal. The concept of transformational leadership is an extension of the work of James Macgregor Burns on political leaders. It has also been extended into organizational psychology and management by Avalio, Bass and Jung (1999) and Ifeanyi and Odumeru (2013).

According to Smith (2016), transformation leaders value and care for their followers, are willing to try new things, and may not be in favour of keeping the status quo. They are not afraid of the unknown and lead in a way that encourages organizational transformation with those willing to try innovative approaches. This type of leadership is closely related to the instructional leadership style of an HoD.

According to Northouse (2016), transformation leaders are thought to tap the potential and motives of followers, making it easier for the team to achieve its goals. He goes on to state that it is a different leadership style from power because it is inextricably linked to the needs of the followers, implying that leaders do not act because of the power bestowed upon them by their leadership position, but in the interest of the followers looking to collaborate with them to achieve the set vision. Transformational leadership also shares power with all stakeholders (Northouse, 2016). According to

Lussier and Achua (2015), transformational leadership is an improvement over other leadership styles in which the focus was on the leader's interests while ignoring the concerns or ideas of the followers.

Northouse (2016) goes on to say that transformational leadership aims to maximize the performance and potential of followers. Leaders who show transformational leadership typically have extremely strong internal values and ideals. They encourage their followers to act in ways that help the overall progress and success of the organization rather than their own. Certain factors that influence this type of leadership style are developed during this process, such as the leaders' and followers' interests, because they are all responsible for the organization's success, making each factor critical in defining the leadership style and its influence in modern society (Northouse, 2016). Transformational leadership affects followers in a positive and valuable way. The transformational leader focuses on transforming others by aiding one another, encouraging them, caring for them, and developing the organization (Nazim & Mahmood, 2016).

Transformational leadership has four components, according to Warrilow (2012):

- Charisma or idealized influence: the extent to which the leader acts admirably, proves his or her convictions, and takes positions that encourage the followers to identify with the leader, who has a defined set of ideals and acts as a role model for the followers.
- Inspirational motivation: the extent to which the leader articulates a vision that appeals to and inspires followers to be optimistic about future goals, while also supplying meaning for the current tasks at hand.
- Intellectual stimulation: the extent to which the leader challenges assumptions and stimulates and fosters creativity in followers by giving a framework for them to perceive how they relate and how they can creatively overcome any barriers in the mission's way.
- Personal and individual attention: the extent to which the leader attends to the needs of each follower, acts as a mentor or coach, and respects and appreciates the individual's contribution to the team. This satisfies and enhances each team member's need for self-fulfilment and self-worth, inspiring followers to greater achievement and growth.

2.2.5.3 Transactional leadership style

This style of leadership also emphasizes the leader-follower relationship, focusing on the mutually agreed-upon benefits gained from a contract in which the leader rewards and celebrates followers for their commitment and loyalty. It is a type of leadership that unites followers around a common goal. They are the leaders who supervise and organize the followers in such a way that the team's performance is not harmed and the goal is met, resulting in success for every award and a failure for every punishment.

Max Weber coined the term *transactional leadership* in 1947 and referred to it as the *legal-rational authority*. The leaders are described as charismatic, authoritative, traditional, and transactional in nature. Transactional leaders, it has been reported, delegate clearly defined tasks to others, while rewarding them for their success (Bantwini & Moorosi, 2016). Transactional leaders work within a defined system, while also following the rules and motivating and punishing followers. The HoD's duty as an instructional leader is to provide teachers with the abilities that they will need to manage a project in this style of leadership, which also highlights the instructional leader's responsibility in preparing followers to lead and manage (according to Smith, 2016).

Transactional leadership is defined as a leadership style that prioritizes organizational achievements focused on the organization by Aksal *et al.* (2020). It is also a leadership style that emphasizes the continuous accumulation of employee productivity over the history of the organization, overlapping with creativity and transformation. According to Ifeanyi and Odumeru (2013), transactional leadership, also known as managerial leadership, is concerned with the role of supervision, organization, and group performance. It is a leadership style that does not want to change the future; rather, it looks to keep the status quo. It is also a leadership style that works effectively in times of crisis and emergency, as well as when projects must be completed in a precise way. Transactional leadership focuses on the lower levels of Maslow's hierarchy of requirements, working at the base level of need fulfilment (Ifeanyi & Odumeru, 2013).

According to Ifeanyi and Odumeru (2013), transactional leaders are more concerned with processes than with forward-thinking ideas. They focus on contingent rewards, which are given when the set goals are met on time or ahead of schedule, or they keep subordinates working at a good pace at various points before completion. In

addition, contingent penalties are applied when performance quality or quantity falls below production standards or goals and tasks are not completed at all. Transformational leaders engage with followers, focusing on higher-order intrinsic needs and raising consciousness about the significance of specific outcomes, according to Hay (2012). Transactional leaders are leaders who exchange tangible rewards for the work and loyalty of followers and are more passive, while transformational leaders engage with followers, focusing on higher-order intrinsic needs and raising consciousness about the significance of specific outcomes and are more active.

Table 2.1: Comparison between transformational and transactional leadership styles

Transformational	Transactional
Leadership is initiative-taking.	Leadership is responsive.
Works to change the organisational culture by implementing innovative ideas.	Works within the organisational culture.
Employees achieve aims through higher ideals and moral values.	Employees achieve aims through rewards and punishments set by the leader.
Motivates followers by encouraging them to put group interest first.	Motivates followers by appealing to their self-interest.
Individualised consideration: Each behaviour is directed to everyone to express consideration and support. Intellectual stimulation: Promote creative and innovative ideas to solve problems.	Management-by-exception: keep the status quo; stress correct actions to improve performance.

(Source: Hay, 2006)

Transformational and transactional leadership, according to Ifeanyai and Odumeru (2013), are bold attempts to describe the nature and effect of leadership. Both have their own set of strengths and weaknesses, and it is important to remember that situational variables have an impact on leadership outcomes in both cases.

2.2.5.4 Situational leadership style

Different situations need different leadership styles. There is a clear relationship between this sort of leadership and the maturity level of individuals who follow it (Basit, Hassan & Sebastian, 2017). Principals, deputies, HoDs, and teachers can all lead and influence groups of individuals. According to Meier (2016), Blanchard and Hersey (1969) developed the situational model on the premise that there is no one-size-fits-all leadership style. Instead, it is a concept in which a leader can employ many

leadership styles, depending on the maturity level of a follower. It is a time-tested, repeatable framework for leaders to align their actions with the needs of the individual or group they are trying to affect. It also considers employees' degrees of competence and devotion, which vary, depending on the difficulties and performance areas. As a result, it considers the task's complexity, as well as the level of direction and support necessary from the leader. Blanchard (2010) rephrased the set of prescriptive principles and recognised four distinct leadership styles, as well as four distinct stages of employee growth within these maturity levels. The following are some examples of leadership styles:

- Use a telling leadership style when the team requires close supervision and guidance. Make decisions, define roles and aims, and communicate them to employees so they may be able to act on them. It is best used in a crisis or when you need consistent outcomes.
- Apply a selling style. When employee commitment is low, apply a selling style. Explain and sell ideas and plans to all parties involved to engage and motivate them.
- Participating style. When the team has an important level of competency and only needs a leader to help the process, use a participative leadership style. Although ability is shared, employees make the final choice.
- Use a delegating leadership style when you are certain that the team has the ability and willingness to manage problems on their own while being available to answer queries with little involvement.

No leadership style is superior to another; rather, success can be achieved by harmonising leadership styles. It is also a leadership style that looks at leadership in multiple scenarios, each of which has demands that must be met for the leader to be effective and for the leaders to change their leadership style to match those varied situations (Northouse, 2016). Situational leadership, according to Shriver (2017), helps leaders grasp the link between an effective leadership style and the level of performance readiness. It also supplies a means for leaders to maximise their influence-related impact. Situational leadership has the following advantages according to Shriver (2017):

- Being a multi-directional model that can be used to influence people at all organisational levels.
- It sets up a common performance language.
- Accelerates and improves the quality of staff growth.
- Is a repeatable procedure that your leaders can use to effectively influence others' behaviour.
- Employs job specificity as a strategy for leaders to maximise their influence-related impact.
- It addresses circumstances in which individuals are developing or regressing.

Situational leadership is a strategy that analyses an employee's full career path. A true situational leader can assess his or her team and use a variety of leadership styles to fulfil the demands of the group in each situation. To promote higher productivity and success, these leaders supply help where it is needed and encourage growth and independence among their staff.

2.2.5.5 Distributive leadership style

Distributive leadership's contribution to the HoD position as a teacher has an indirect, but significant, impact on a school's efficiency and students' achievements (du Plessis, 2014). It also means that school leadership is distributed around the school and is not restricted to a single formal leader. Distributed leadership is described as activities and interactions that are distributed over various people and situations involving role complementarities and network patterns of control, according to Timperley (2005) and Williams (2011). Leadership can be given throughout the school as teachers interact and learn from one another, recognising that there are multiple leaders and those leadership activities are shared within organisations.

This also emphasises that, as in a school setting, leadership is a collaborative endeavour (Harris & Muijs, 2006). It can also be characterised as the intentional division of leadership tasks on teacher professional development by the HoDs as a group of formal leaders (Devos & Hulpia, 2010). Distributed leadership is also

associated with the formation of learning communities, professional learning, ability development, personal and professional growth of educators, increased awareness in addition to a sense of responsibility, continuous assessment practices, and whole-school improvement (De Villiers & Pretorius, 2011).

Botha (2014) defines leadership as a responsibility shared by all members of the School's Management Team, as well as personnel, ensuring that school operations are not primarily in the hands of one individual. In a school setting, for example, leadership is not simply about one person. As a result, Maja (2016) proposes that dispersed leadership is a crucial part of instructional leadership because everything is connected and interconnected. The study also considers that for good teaching and learning to occur, all stakeholders within the school must be involved, with the concept of leadership being based on cooperation.

This leadership style has both advantages and disadvantages, and, by discussing it, the HoD is exposed, not only to one type of leadership, but to a combination of multiple leadership styles. One of the benefits is that you can lead by example, including and empowering others. This creates a sense of belonging among instructors, making them feel like notable members of the school community (Hughes & Pickeral, 2013). Furthermore, everyone learns together, helping to increase student accomplishment by collectively building meaning, as well as knowledge (Botha, 2016).

Distributed leadership does not, however, supply a solution to all difficulties, according to De Flaminis & Harris (2016). It can be damaging, not to mention harmful, if not implemented effectively and can have both positive and negative results. Distributed leadership may not be helpful if not skilfully implemented (Sibanda, 2017). Teachers might use it to weaken a principal's authority, hence arguing its influence (Harris, 2013). As a result, HoDs are faced with the issue of combining two roles: performing managerial responsibilities and teaching in their classrooms. This may make their teaching and learning responsibilities difficult.

Leadership will supply structure and direction for educational institutions, in addition to keeping learning environments that are favourable to learning. As a result, it is critical to set a good example and take responsibility for ensuring that learning occurs.

According to Margolin (2013), an HoD in the twenty-first century should have the following leadership abilities:

- Leadership that exemplifies and develops 21st-century professionalism by engaging in professional development and enabling others to do the same.
- Creative leadership promotes innovation and design in bringing people on board while focusing on practice, structure, and cultural changes.
- Membership in professional learning communities (PLCs) and networks fosters and sustains social and linked leadership.
- Leadership is a complex process involving a wide range of non-formal partners, including schools.

There is a link between these various leadership styles, in addition to the study that focuses on the HoD's instructional leadership function (Goddard, Goddard, Miller & Sook, 2015). In addition to collaborating to improve teaching and learning, instructional leadership is a blend of diverse leadership styles that can improve initiatives, stimulate the HoD function to develop a more dynamic collective relationship, and aid teachers in clarifying instructional goals (Aldabi, Braganza & Hejres, 2017). As a result, the HoDs must fine-tune their leadership style for various situations. Many diverse types of leadership styles can be used, and it is vital to consider them all.

2.2.6 Summary

To summarise, managing people is an arduous process and many leaders employ a variety of ways to build their organisations. For many years, researchers, scholars, and practitioners have defined leadership in a variety of ways, with little agreement. The definitions, however, share certain commonalities. There is, however, some parallel between social influence and followers investing in shared activities. Leadership is used by all organisations to engage and inspire employees and achieve their aims. To fulfil their instructional leadership position and promote student and teacher achievement, HoDs must influence others and actively involve stakeholders. As a result, the department head must understand that this notion of leadership should create an effective and efficient departmental leader. In addition, these findings help in this study to decide what skills and knowledge are needed to lead 21st century schools.

A discussion of the role of the HoD as an instructional leader follows.

2.3 THE ROLE OF THE HEAD OF DEPARTMENT AS INSTRUCTIONAL LEADER

The HoD can become an instructional leader by building an unobstructed vision for the school and by generating an image of where the school is or could be headed, as well as promoting a healthy learning environment in which all school staff members respect, trust, and are honest with one another. The HoD can help teachers learn by supplying opportunities for professional development, raising teacher performance standards and improving classroom-based strategies to improve teaching and learning in meeting curriculum standards by cultivating a culture that values learning and rewards achievement (Mestry *et al*., 2013). As a result, instructional leadership emphasises the role of heads of departments in supporting teaching and learning, deciding the mission, and directing curriculum and instruction (Bush, 2013). According to Scott (2015), the HoD's job as a leader is crucial to the successful implementation of school improvement projects, as is their capacity to manage individuals within their departments.

The Employment of Educators Act 64 of 1998 (RSA, 1998) defines the functions of a Head of Department in South Africa, which include, but are not limited to, administration, teaching, personnel management, extra-and co-curricular activities, and communication. According to the Department of Education (DoE) (2000b:6-9), the primary responsibilities of the HoD are to manage a subject or a phase, to teach the subject, to provide and coordinate guidance on the latest ideas and approaches to the subject, method, techniques and evaluation, along with assisting and effectively communicating these to the staff members concerned, and to collaborate with colleagues to maintain good teaching practises.

Leadership positions can have a significant impact on the quality of teaching and learning. The 21st Century Leadership model, which places the HoD at its centre, can direct an instructional leader's everyday activities. The HoD's position as an instructional leader is the focus of this research. Table 2.1 of Revised Personnel Administrative Measures (PAM) (DBE, 2016) describes the HoD's responsibilities as an instructional leader.

Table 2.2: The role of the HoD as an instructional leader

Responsibilities include	Application in practice
To supervise a subject, learning area, or phase;	Monitor teaching and learning, as well as the curriculum (Poopedi, 2011).
To work together on the department's policies;	To support teaching and learning, a policy should be designed and implemented (DoE, 2005).
To aid with the coordination of all subjects in that department's evaluation/assessment, including homework, written assignments, and so on;	Monitoring, evaluating, and analysing results, as well as double-checking planning and deciding whether the goal has been fulfilled. To see and visit classrooms. Teachers' record-keeping and student progress should be moderated (DoE, 2005) to manage their subject team's teaching and learning (Rajoo, 2012).
To supply and coordinate guidance on the most recent ideas in the field, such as approaches to the subject, methods, techniques, evaluation, aids, and so on, and effectively communicate these to the staff members concerned, on syllabi, schemes of work, homework, practical work, remedial work, for inexperienced staff members, and the educational welfare of learners in the department.	To ensure that there was teaching and learning. To be a motivator and mentor for teachers. After attending meetings, teachers should be given feedback. To supply professional development, find teachers' needs, and to keep them up to date on new developments (Bak, 2010:464).

(Source: DBE, 2016)

As seen in Table 2.3, an HoD serves as both an instructional leader and a supervisor, according to the PAM guidelines.

Table 2.3: The role of the HoD as an instructional leader and supervisor

Responsibilities include	Application in practice
To check the work of educators and students in the department.	Teacher evaluation results, analysis, and planning (DoE, 2005).
Taking on extra-curricular and co-curricular activities as a team.	When planning activities, divide work among members of the management team.

(Source: DBE, 2016)

The PAM (DBE, 2016) document also shows the role of the HoD as an instructional leader and supporter, as outlined in Table 2.4 below.

Table 2.4: The Role of the HoD as an instructional leader and supporter

Responsibilities include	Application in practice.
To inform the principal about the division of work among the staff in that department.	To achieve the school's goals, it is necessary to maximize the efficiency of staffing and resource allocation (DoE, 2005).
To participate in agreed-upon school/educator appraisal processes to review their professional practice regularly in order to improve teaching, learning, and administration.	To aid the principal in the evaluation of teachers by seeing and supplying feedback (Ghavifekr & Ibrahim, 2014). To conduct on-site monitoring and aid, the HoD can help teachers with their ongoing professional development (DoE, 2005).
To aid with the planning and management of school stock, textbooks, and equipment for the department in general/administrative roles. The department's budget is decided by this.	To supply opportunities and resources for teachers (Ghavifekr & Ibrahim, 2014). To plan the budget for each department and subject work schemes to ensure textbooks and equipment are in good condition (DoE, 2005).
To conduct or aid with one or more non-teaching administrative tasks, such as being the secretary to a general staff meeting and/or other meetings, such as fire drills and first aid, timetabling, fee and other monetary collection, staff welfare, and learner accident meetings.	To organize and prepare for professional development programmes, such as training and workshops. To help with school administration. Within the school, to plan and conduct clinical activities (Ghavifekr & Ibrahim, 2014).
To act on the principal's behalf while she or he is absent from school if the school does not qualify for a deputy principal or if both are absent. To collaborate with colleagues to keep an elevated level of teaching and progress among students.	To perform supervisory and management functions as needed (DoE, 2005). In the absence of a principal or both, to serve as a stand-in. To communicate the school's values and beliefs (DoE, 2005).
To develop the department and conduct extracurricular activities in collaboration with educators from other schools.	By networking and collaborating with others working on agreed curriculum goals, to coordinate teaching teams (DoE, 2005).
To meet with parents and discuss with them their children's progress and behaviour.	To discuss the progress of children with their parents. To intervene (at the request of teachers) when parents complain (DoE, 2005).
To take part in departmental and professional committees, seminars, and courses to contribute to and/or update one's professional views and standards. To stay connected with sports and social organizations, as well as cultural and community organizations.	To participate in professional development programmes to gain knowledge and skills to improve the learning process for teachers and students. To achieve a 'cultural relationship' based on principles of openness and collaboration by fostering relationships within the community that supply support during tough times (DoE, 2005).

(Source: DBE, 2016)

HoDs have both a teaching and a supervisory function in the administration of their departments, as well as supplying professional aid to instructors, according to the National Education Evaluation and Development Unit (NEEDU, 2013:81). HoDs can serve as a liaison between the principal and the staff, supplying instructional aid to teachers, as well as planning, organising, commanding, coordinating and controlling delegated responsibilities (NEEDU, 2013:81). As a result, the HoD, as middle management and the closest to classroom practices than other management structures, is faced with the difficulty of supervising subject management and of supervising staff and students, as well as his or her own teaching: the HoD's task is a much more ardent one than a teacher's classroom experiences (Bush, 2011). In the function of the HoD as an instructional leader in a South African primary school, this style of leadership is critical. Ruding (2003:3) claims that:

> *Since instructional leaders, HoDs have a significant role in affecting and improving schools, as they play a vital part in teaching and learning while each one also contributes to the entire school as an educational leader.*

2.4 THE HoD AS MIDDLE MANAGER IN THE SCHOOL CONTEXT

In schools, middle management is responsible for a significant percentage of the work that needs to be done to manage the teaching-learning process. According to the literature on school leadership, middle managers play a vital role in managing teams of teachers to guarantee that curricula are produced, presented, and assessed, that programmes are evaluated, and that instructors are developed. While instructional leadership has been studied extensively around the world, it is new to the South African educational system. It is vital that the HoD, as the instructional leader, prioritises teaching and learning as central to his or her responsibilities. In recognition of the significance of their work, HoDs or middle managers should be trained, developed, and supported in leadership and management abilities to manage teachers in the face of frequent changes in curricula (Koh, Gurr, Drysdale & Ang, 2011; Gurr & Drysdale, 2013; Turner & Sykes, 2007). As middle managers and curriculum specialists, the HoDs are expected to be at the forefront of the struggle for better teaching and learning environments for students. Given what has been said, the role of leadership should include the incorporation of 21st century skills into classrooms, and professional development should be aligned with teaching and learning, which

includes 21st century standards, curriculum, instruction, and assessments (Bishop, 2009). This is relevant to the research topic since it is one of the 21st century abilities that the HoD will need as an instructional leader in the use of technology.

Improved information and communication technology (ICT) has revolutionised people's lives and education. According to studies, the usage of ICT can improve education (Barrs, 2012; Barrs & Barak, 2012; Barrack, Haick & Watted, 2016; Blattner & Fiori, 2009; Chen, Teng & Wang, 2015). The impact of ICT on education can be seen in changes to the teaching process, the teaching environment, the syllabus content, and the teacher-student interaction, all of which affect the teaching and learning process (Dorstal & Wang, 2017).

According to Lindqvist and Pettersson (2019), digitization has permeated our culture and schools and has prompted an emphasis on the role of leadership in this process. According to the US Department of Education (2017), leadership should be able to build a shared vision that includes all stakeholders. The delegation, as well as demonstrations of how technology may enhance teaching and learning, are essential leadership abilities. Leaders must have experience with technology and resource management abilities, as well as a clear knowledge of how technology may enhance learning. To stimulate the use of ICT in the classroom, a favourable environment for networking, collaboration, and professional growth must be created. Concerning the research question, the HoD, as an instructional leader, can affect change through his or her position as a leader. HoDs are also in charge of implementing technology-based education in the twenty-first-century classroom, as detailed in the next section.

2.4.1 Summary

The practices and processes of leadership that promote efficient and effective schools are what make them successful (Bush, 2013; Mestry & Pillay, 2013). The study on how important leadership is was necessary for several reasons, one of which is the belief that earlier material was too prescriptive. The researcher has endeavoured to obtain knowledge of what it is like to serve as a Head of Department in a demanding, multi-disadvantaged environment as part of this dissertation. As a result, descriptions of the actions of Heads of Departments in schools and a knowledge of what influences their decisions may supply useful, contextual insights into how they approach their work, as well as contribute to national and international studies on instructional leadership.

2.5 THE INTEGRATION OF TECHNOLOGY WITHIN 21st CENTURY EDUCATION

2.5.1 Introduction

The integration of computers into schools, including classrooms, has become an essential part of the teaching and learning process. Personal computers, the internet, in addition to advanced electronic devices, such as touchpads, e-book readers, notebooks, remote monitoring, mobile phones, iPods, mini-notepads, databases, remote servers, Google apps, coupled with Cloud networks, are supplying newer and more effective ways of mitigating some of the challenges that the educational system is currently facing (Phill *et al.,* 2012). According to Rana (2017), the impact of technology on teaching is profound because it frees the classroom from the constraints of space and time, thereby adding to the teaching and learning of learners by supplying access to source materials. Technology, according to Rana (2017), not only aids, but also transforms, the way people learn. So, if used effectively, technology allows teachers and students to break away from traditional teaching and learning methods (Kozma & Vota, 2014).

According to UNESCO (2013), technology has transformed the world in previously inconceivable ways to meet the problems faced by the educational system. Computers, the internet, and other electronic devices have become indispensable in daily life, transforming how information is gathered. According to Eady and Lockyer (2013), these gadgets have become more powerful and come in a variety of sizes, ranging from those that sit on your desk to those that fit in the palm of your hand. The internet allows us to connect to these devices. This, along with how technology is used within the curriculum and managed by teachers, will play a key role in broadening the resources and knowledge base for both teachers and learners. The role of the HoD in this process is to improve teachers' skills, knowledge, and performance, as well as to improve the school's curriculum (Bertram, Mthiyane & Naidoo, 2018).

2.5.2 The Benefits of Integrating Technology into Education

Quality education has traditionally been associated with qualified and experienced teachers interacting with students in a personal manner through a variety of teaching approaches, which can be viewed as a social activity. Technological advances are

transforming the way people live, work, and learn (not to mention play) as the world enters its Fourth Industrial Revolution (4IR) (Kruger, 2015). Due to its impact on educational outcomes, the role of ICT in education has grown in importance (Adesote & Fatoki, 2013).

Teaching and learning, according to Van Jaarsveldt and Wessels (2015) are complicated processes requiring many tasks, efforts and flexibility on the part of teachers and learners. Teaching is also known as knowledge transfer, while learning is the process of changing an individual's behaviour. The use of information and communication technologies (ICT) in the teaching and learning process is viewed as a mediator between elements or a bridge resulting in a variety of benefits (Vandeyar, 2015). Technology, according to Costley (2014), has a beneficial effect on learning because it leads to learners becoming more engaged, keeping more information, and supplying meaningful learning experiences, implying that they can learn better, thereby achieving more. As an instructional leader, the HoD could apply it by way of encouraging teachers to integrate technology into the teaching and learning process.

Technological integration will improve teaching and learning environments in the classroom, allowing students to learn better by achieving more. As a result of this integration, teachers will be able to create and distribute more effective learning materials, which will reduce learning difficulties (UNESCO, 2013/4:35). Educational technology, according to Januszewski and Molenda (2013), is a way to help learn as well as to improve performance by creating, using, and managing technological resources. If ICT is used properly in education, it can promote a shift to a learner-centred method of learning, which is an important investment (UNESCO, 2015).

2.5.2.1 Investment in technology

It is estimated that the amount of money spent on technology in schools has more than tripled in the last century (Chai *et al.,* 2013). Learners, because of this investmentin technology-based learning environments, will have more opportunities to search for information, analyse it for answers to questions, solve problems, communicate, and collaborate: this is crucial for participation in an international community, for achievement, and for competition), and it makes learners more competitive in the 21st century marketplace. Technology investment is crucial for this study because it has a

favourable impact on the teaching and learning process, and on leadership, in the school environment. According to Chai *et al*., (2013), although technology has not altered schools as promised, it has changed the way we work, live, interact, and play. These shifts have resulted in the emergence of new industries, legislation, and study fields. Google, Microsoft, Apple, eBay, Amazon, World of Warcraft, as well as Facebook, to name a few, are widely used websites that indicate the diversity of these technologies. Modern technology has not only changed the physical world, but has also created a new digital universe, contrary to widespread belief.

According to Edwards (2013), digital resources are critical for transforming learning and teaching. The key role of schools in the Gauteng Province is to provide learners with the skills and abilities they need to be more competitive in the twenty-first century to deal with challenges, such as digital literacy, new digital divides, the blurred boundaries between formal and informal learning, and the use of technology to check and assess their learning (Groff, 2013). Teacher training is crucial to the successful deployment of educational technology initiatives in schools because of the relevance of digital resources to improving teaching, learning, and operations (Morshed, 2016). Teachers play an important role in the successful integration of ICT in teaching and learning: they are change agents who can lead to enhanced educational achievement (Dede, 2008:7; Brindley, Hennessy & Ruthven, 2010; Hunde & Tacconi, 2013:708; Tedla, 2012:202; Nyambane & Nzuki, 2014:4; UNESCO, 2012:7).

2.5.2.2 Improved performance

Technology can be used to encourage learners to think critically and to engage in problem-solving as a means of improving performance (Costley, 2014). Technology can also be used to alter and rearrange the classroom environment to promote the development of higher-order thinking skills (Costley, 2014). Teachers and the HoD can better evaluate students' understanding and performance while using technology. The significance of this is that it will allow learners to be self-sufficient, in addition to being able to control their own learning.

Additionally, technology will help students to engage more with one another, allowing them to work together on projects and to learn from one another by moderating one another's work, according to a new study. Teachers can use technology to improve

the way students learn (Costley, 2014). Miller (2011) adds that, by using technology, learners can interact, exchange ideas, conduct independent research, adapt to new situations, and thus take ownership of their learning via a process, such as distance learning. The significance of this is that technology can supply the keys to unlock learning for all learners through a distance learning process.

2.5.2.3 Distance learning

Learners, including teachers, will be able to connect from a variety of locations thanks to the integration of distance learning into the teaching and learning process. Ozen (2012) reaffirms this by saying that various sorts of programmes are being employed that do not require learners to be in the same location as the teacher, thereby allowing them to study anywhere and at any time. This sort of learning, according to Coffey (2012), can build a sense of community and positive social interaction since learners feel that they are part of a group and are willing to take part in the learning process.

Technology has become the greatest vehicle for the twenty-first century, affecting the lives of learners and teachers by increasing communication, expanding educational services, and improving the quality of personal interaction by allowing them to become part of a group and take part in the learning process. According to Tutkun (2011), the internet may be used as a source for teaching materials, allowing students to be more actively involved in helping them remember what they have learned.

Learner-teacher discussions will be more in-depth, allowing the learner to become more self-sufficient, in addition to getting access to educational resources. Both learners and teachers can receive help from technology's ability to unlock the secrets to learning. When used to engage learners in the learning process, technology can be an excellent tool for learning. As part of the curriculum, teachers should incorporate technology to help students learn how to use it effectively and to reap the benefits of doing so. Learning through e-learning is another method that could be added to the teaching and learning process.

2.5.2.4 E-Learning

Formal and non-formal learning at various levels is part of the e-learning system, which uses a local network, the internet, and intranet or extranet to teach content while

allowing for interaction between students and teachers, as well as between students and the content (Moore, Dickson-Dean & Galyen & 2011).

E-learning and face-to-face teaching, according to Novo-Corti, Ramil-Diaz and Varela-Candamio (2013), combine traditional classroom learning with virtual surroundings (computers). Students are provided with opportunities to interact with their lecturers informally and formally, asking questions and addressing concerns connected to their studies (Limsuthiwanpoom, Kanthawongs, Kanthawongs & Suwannee, 2016). This aspect is relevant to the study because it encompasses all educational activities undertaken by individuals, as stated by Awuor, Kyambo and Ouma (2013) and Dickson-Dean *et al*., (2011), who say that e-learning is the combination of modern technology in the classroom, which can include learning that is completely independent of mediation, and learning that can take place at home.

There are many reasons why technology can be used to enhance the teaching and learning process, but they all revolve around achieving educational goals, not the other way around (Hannaway, 2016). When technology is properly integrated into the curriculum and used in a meaningful way, it will help students and have a positive impact on both the learning process and the outcome.

ICT can be employed as a cost-effective instrument for professional development. There are, however, contextual elements that influence the intentions and tactics to deploy technology in schools successfully, and these are viewed as obstacles to the successful implementation of technology in schools. We shall discuss later how to overcome the hurdles of integrating technology into the teaching and learning process.

2.5.3 Summary

To conclude, the HoD needs to ensure that school resources are used in a way that is conducive to the institution's mission, requiring insights into the global needs of the school. At present, computer equipment has become important. The instructional leader must ensure that the staff are knowledgeable about, and up to date on, modern technology (ICT). Teachers may be the primary drivers in ensuring effective and efficient ICT integration in the classroom, thereby increasing their knowledge and abilities. According to Chan and Singh (2014), information and communication technology (ICT) can create a powerful learning environment that can revolutionise

the entire teaching and learning process. This aids the researcher in addressing the study's purpose of this study, which is, the function that the HoD, as instructional leader, plays in the use of ICT in the classroom by giving direction, guidance, and support in ensuring that teaching and learning occurs.

2.6 CHALLENGES WHEN INTEGRATING TECHNOLOGY IN EDUCATION

2.6.1 Introduction

To integrate technology successfully, both external, as well as internal challenges, must be addressed, according to Jacovina, Johnson, Russell & Soto (2016). Ertmer *et al.* (2012) state that more effort is needed to overcome external challenges, such as inadequate equipment, inadequate training, and support constraints, to name just a few of the issues.

The internal challenges are related to the teachers, their beliefs, including their knowledge (Jacovina *et al*., 2016). These issues are regarded as personal and unique to each teacher. Teachers' attitudes, as well as beliefs, have a significant impact on the role and effectiveness of technology in the classroom, including how it is implemented. For teachers to feel comfortable and confident in their ability to use technology, they must have confidence in their skills and knowledge. As a result, training and support are needed to increase teachers' knowledge and confidence. The following challenges are experienced.

2.6.2 Resistance to Change and Negative Attitudes

Teachers' attitudes are important in teaching and learning, according to Mikre (2011). This is especially true when it comes to using technology in schools. Teachers need to feel comfortable, as well as knowledgeable, about the use of technology in the classroom, and this requires a positive attitude. Teachers need to be clear about the extent to which technology can be used to enhance learning. It is a common problem among teachers that that they think that they are not qualified to teach with ICT or even use it in their classrooms. Motivation and self-belief in integrating technology into education come from having access to it and the necessary skills for doing so (Mikre, 2011).

2.6.3 Lack of Time

According to Kennah (2016), schools must aid teachers by supplying adequate time and support for integrating ICT into the teaching and learning process. Teachers who are competent in using ICT, on the other hand, state that using ICT takes a lot of time. Because of the way the curriculum and evaluating systems have been designed, teachers have little time to plan ICT lessons because they are more focused on completing the curriculum (Khan, SH, 2014). Time, according to Chen, Lim, and Tan (2012), is a barrier to teachers' use of ICT in the classroom. Aside from completing their assigned workload, teachers must also aid in the planning and organization of curricular and co-curricular activities, as well as executing administrative duties.

2.6.4 Insufficient Funds

The cost of implementing technology in schools is high. Teachers' reluctance to use technology in the classroom is attributed to a lack of funding. Lack of funds is a major barrier to ICT integration in schools, because it affects the availability of hardware and software as well as teachers' access to resources (Eze & Olushola, 2013).

2.6.5 Lack of Accessibility

Computer access is a concern for many teachers. Resources are Insufficient, not always because of a lack of hardware and software or other ICT materials in schools, but because of other factors, such as poor organisation of resources, low-quality hardware, inappropriate software, or lack of personal access for teachers (Sicilia, 2005:50).

According to UNESCO (2020), as more schools closed, paper-based and digital distant education platforms have become critical to the continuous provision of education for all in the framework of COVID-19. Many students have struggled with remote learning as schools have been closed for more than a month. Students simply could not take part in distance education to continue their learning if proper information and communication technology (ICT) devices, internet/mobile network connection, and educational resources were not available, and if adequate teacher training had not been implemented. Students from resource-poor locations, remote rural areas, and low-income families were among those who were left behind. Added support was

needed for impaired children or students who spoke a different language at home from that used at school.

According to UNESCO (2020), even before the COVID-19-related school closure, the use of radio, video, and television for remote learning had proved to be powerful components of well-designed numeracy, literacy, and financial education programmes for children, youth, and adults living in remote and rural communities. The monitoring and support of trained teachers are, however, needed for the execution and reach of such programmes. One of the needs for successful distance learning is that school systems should recognise the needs of parents and guardians who must step in to promote learning to continue and preserve their children's education; this is particularly for children in the early grades (Grades 1-3), who need more one-on-one aid. Students with low digital literacy are likely to fall further behind if they do not receive ICT-skill support.

Parents, teachers, communities, and networks that are adopting creative interventions to widen digital abilities, such as mobile-based Wi-Fi networks, have inspired a lot of hope. They are, however, only temporary solutions. Although they are motivating, more fundamental changes are needed to improve access to, and the usage of, ICT at home and school.

2.6.6 Ineffective Training

The use of technology in education requires a new set of skills, which would require teachers to undergo continuous education. Teachers must become familiar with using technology before it can be implemented in schools (Mathevula & Uwizeyimana, 2014). To increase their ability to use ICT in the classroom, Krauss and Nkula (2014) state that teachers need access to a variety of training that addresses both technical and pedagogical needs.

According to UNESCO (2020), internet access and ICT equipment should be supplied in schools, but, in addition, learners must be supported by developing their ICT abilities. Teachers, on the other hand, must be trained in the use of remote learning platforms to continue teaching and learning. Many teachers have not obtained basic teacher training, even though they may have been able to reach pupils with their existing set of abilities and equipment. Now, however, the fact that most training

programmes have not involved, or do not involve, the use of ICT in education to build proper learning and teaching methodologies is quite concerning. The usage of ICT in education during COVID-19 and beyond is a reality for which teachers and students must be better prepared (UNESCO, 2020). According to UNESCO (2020), digital technologies must be integrated into sound instructional programmes to produce effective student learning experiences.

2.6.7 Insufficient Technical Support

Teachers will be unable to overcome the challenges of using ICT because of a lack of good technical support and resources. Yilmaz (2011) believes that technical support is essential for the successful integration of the hardware and software that exist in schools. If a school has only a limited amount of hardware and software, it has a limited chance of integrating successfully. According to Ertmer *et al*., (2012), diverse types of support are needed to ensure effective integration, including administrative, technological, professional, and peer support. The teacher needs aid in dealing with various technologies, as well as dealing with technical difficulties. ICT integration is likely to be hampered by a lack of technology in schools.

2.6.8 Lack of Infrastructure

Some of the obstacles that prevent the implementation of ICT in schools include a lack of infrastructure, including the Department of Education's inability to sustain projects (Dzansi & Amedzo, 2014). Furthermore, according to Aydin (2012), the challenges teachers face with technology integration may lead to teachers avoiding using technology, not providing learners with engaging learning experiences with technology, or using technology in ways unrelated to academics (Ertmer *et al*., 2012). To address these issues, programmes to prepare teachers, professional development and mentoring programmes, as well as integrating technology into the curriculum, could be beneficial (Anglin, 2017). Understanding technology integration efforts on the part of teachers could potentially contribute to teachers being better prepared in this regard.

To address these issues, Johnson *et al*., (2016) contend that teachers should have a say in the technology used in their classrooms. For teachers to accept technology as part of the teaching process, better organization of available technology must help

them to find and to access tested technology. The reasons for discussing the challenges of integrating technology into education are necessary for understanding the value of ICT resources in education because they can improve teaching and learning, while they can also supply opportunities for innovation in content, methods, and pedagogy. In order to integrate ICT in schools successfully, there is a need for an awareness of both the potential that technology supplies and the needs that arise from the school's environment. Teachers must be trained and given extensive training to implement ICT in schools. To reap the benefits of ICT development in schools and to overcome the obstacles it offers, teachers must be conversant with the many types of ICT tools and must have knowledge of how to use them. The leadership position of the HoDs, as well as the leadership style and abilities needed for success, are at the heart of school technology deployment.

2.6.9 Summary

Technology can help students to learn more effectively and teachers to become more efficient. Technology integration in the classroom is becoming more widespread, and it has proven to be beneficial. A literature review was conducted on how ICT technologies are used and found in South African classrooms. While analysing ICT, it is necessary to evaluate both the challenges of integrating ICT and its potential to improve teaching and learning. This contributes to the research aim of the role of the HoD in contributing to the efficacy and improvement of ICT use in a twenty-first-century classroom.

2.7 THE INSTRUCTIONAL ROLE OF THE HoD WITHIN THIS PROCESS

Technology has always been an integral part of the teaching and learning process, and it is one of the resources that teachers must employ to aid with the teaching and learning process (Eady & Lockyer, 2013). The importance of understanding how ICT and pedagogy interact is to recognize that information technology affects all aspects of human activity and plays a significant role in education and training. According to Du Toit (2015), technology has the potential to change the teaching and learning process, and its importance in the teaching and learning process is growing. According to Eady and Lockyer (2013), teachers can use technology in the classroom to model

real-world practices, create and present lessons, and communicate with other teachers about educational issues (Du Toit, 2015).

As a result, the HoD must have a vision for leading and learning with technology, as well as broadening their technical skills, including perspectives to understand the trends and developments in technology and learning. The HoD can influence teacher motivation and ability, as well as the climate and environment in which they work and teach (Bathon *et al.,* 2013). Technology can have a significant impact on the environment in which teachers work and teach, and it will allow teachers to create meaningful learning experiences that incorporate technology (Eady & Lockyer, 2013).

The role of the HoD is to provide teachers with the necessary support and training so that the teachers may succeed in designing meaningful learning experiences using technology; to do this, the HoD should set a clear purpose that everyone understands, should set up lofty expectations, and should use data to track progress and performance. The HoD should also aid teachers in creating, manipulating, and sharing information on computers and networks, and this aid could be conducted by supplying activities at various levels as well as developing first-hand activities (Costley, 2014; Herron, 2010). The HoD can aid teachers in reorganizing and redesigning their classrooms to incorporate technology to promote higher-order thinking skills in the classroom (Costley, 2014). Teachers must buy the necessary technology and develop the necessary technical skills, which can be achieved with the help of the HoD and with ongoing training and professional development. This training is critical for teachers to succeed because it provides them with the necessary skills to explore resources that are freely available on the internet. Teachers will be able to learn new skills, to use new tools, and to find educational materials because of the potential use of technology. This will also allow teachers to stay current on educational developments and learn how other teachers deal with problems (Wolfenden, 2015).

ICT has had a significant impact on education, organizations, teaching, and learning. It has become a part of the curriculum, with elevated levels of effective and proper use seen to support the teaching and learning process across various subjects (Aristovnik, 2012). The use of ICT in the classroom will, with the influence of the HoD, bring learning to life for both learners and teachers, giving them the tools to collaborate,

examine engaging problems, research and analyse information, use ICT resources to communicate their ideas, and share what they create with others outside the classroom (O'Sullivan, 2015).

2.8 CONCLUSION

A review of the literature on instructional leadership as a strategy to ensure effective teaching and learning was presented in chapter two. As part of a strategy to change leadership within schools to ensure effective teaching and learning, it discussed leadership as a concept and leadership within the school context, as well as the role and place of the HoD as an instructional leader. The discussion highlighted the need for the HoD, as an instructional leader, to use ICT in educational practices to improve the use of technology-based education in selected South African primary schools, as well as to gain and share knowledge with peers and improve teaching strategies to allow their learners to achieve 21st century learning skills.

The study introduced the concept of leadership, as well as leadership within the school context, and the concept of instructional leadership, as well as the role of the HoD as an instructional leader. It continued with a discussion of 21st century school technology and the role and responsibilities of the HoD with reference to the use of technology in education. In addition to the benefits and challenges of technology integration in teaching and learning, the chapter also examined the leadership styles and skills required by the HoD to implement effectively the use of technology within primary schools. The chapter that follows discusses how the research fits into larger debates about the practices that need to be investigated to decide the effectiveness and improvement of technology used by public primary school teachers in the Gauteng Province. It will also go over the various levels of professional development that are needed to help teachers learn to use technology in their teaching and learning, as well as the role of the HoD in this process.

CHAPTER 3

THE ROLE OF ICT IN THE EDUCATIONAL CONTEXT

3.1 INTRODUCTION

As stated in Chapter 2, the use of ICT in all aspects of life was highlighted. The role of the HoD in an educational setting and the concept of leadership in the school setting were discussed. The literature on the use of ICT in classroom instruction and on teacher training in South African primary schools is reviewed in this chapter. It also examines school policies and practices in a few selected nations, and it compares the education systems in these countries with South Africa's education system.

The importance of leadership was underlined in Chapter Two, as were leaders in the educational setting, the notion of leadership, and the role of the HoD as an instructional leader. The benefits and challenges of integrating technology into education and learning, as well as the role of the HoD as an instructional leader within this process, were also explored. Chapter 2 reviewed ICT literature on the following: classroom instruction, ICT teacher development, ICT policies and practices in South African elementary schools, linked to ICT functions and resources, and policies and practices in some selected nations for the use of ICT in primary schools, as well as a comparison of ICT education policies in primary schools and in South African schools in general.

First, in this chapter, there is a review of the literature on how ICT can be best linked with teaching approaches; it begins with the use of ICT in classroom education and the development of digital citizen skills with ICT. Then there is a discussion about ICT teacher training and the implementation of policies for the use of ICT in education, as well as policies and practices for the use of ICT in South African elementary schools. Following that, there is a discussion of education policies and practices regarding the use of ICT in primary schools in a few selected countries, as well as a comparative examination of the use of ICT in these nations. The chapter concludes with a discussion of the functions and resources of ICT in South African primary schools.

3.2 THE ROLE OF ICT IN CLASSROOM INSTRUCTION

3.2.1 Introduction

According to Mikre (2011), the use of ICT has had a significant impact on learning and teaching. According to studies, students who use ICT have higher learning gains than those who do not (Mikre, 2011). The incorporation of ICT into the classroom has resulted in the change of the traditional classroom from a one-way communication situation to a two-way communication situation, which allows both the teacher and the learner to take part in the lesson (Bhattacharjee & Deb, 2016). Hicks (2011) states that the benefits of incorporating technology into the classroom could also serve as an attention-keeper for students. ICT should be used, not only for skill development, but also to prepare students for how to use ICT (Adu & Galloway, 2015).

The primary focus of this research is the instructional role of the HoD in enhancing the use of technology-based education using ICT. The subsection that follows examines the literature on using ICT in classroom instruction, with a focus on goals, networking and collaboration, and developing learners' digital citizenship skills.

3.2.2 Using ICT in Classroom Instruction

Technology may be used to increase the technical abilities of the teachers, to improve the learning process, and to improve the management of the classroom. Teachers must become collaborators in the learning process and search for new knowledge, and, in so doing, they will develop new skills alongside their learners. In this way, the teachers, through their teaching, will profit from technology (South, 2017).

The use of technology in the classroom can improve and enhance both the informal and formal teaching and learning processes. According to South (2017), by personalizing learning or through experiences that make them more engaging and relevant, teachers can design a variety of learning experiences from which students can choose, such as drafting essays, producing media, building websites, and collaborating with experts from around the world. This will allow learning to become more engaging and relevant to students. When teachers construct learning around real-world difficulties, they situate learning in the context of actual situations, extending over time, and they incorporate knowledge from diverse sources. This type of authentic learning uses technology to assist students in developing 21st century abilities, becoming creative, collaborating, and taking on leadership positions, as well

as engaging in challenging, real-world situations that will assist them in becoming critical thinkers. Students could submit their work online and receive feedback from others, instead of writing a report that only a few people will read (South, 2017).

Learning, which has always taken place in the classroom, can now be extended to museums, libraries, and other non-school settings, as well as virtual spaces. Events, like Global Read *Aloud*, bring classrooms together through literacy. This new way of learning also guides students through the process of shared reading and raises learners' awareness of their place in a world of readers. This global connection can lead to a more in-depth understanding, not only of the literature, but also of other students. Furthermore, technology can aid students in following their passions and personal interests. Students who learn a different language can read works by authors in their native language, collect data, and create structures, and they can develop learning skills that are personally relevant to them. The ability to use technology in order to research topics of personal interest would allow students to practise, explore, and research further, allowing them to become lifelong learners. Technology will aid in closing the digital divide, supplying learning opportunities to all students by allowing them to improve their skills, to take part in online programmes, and to achieve their goals, regardless of their locations (Metros & Sun, 2011).

According to researchers such as Eze, Adu and Tadu (2013), the use of ICT in the classroom has become critical in the twenty-first century. It allows teachers to incorporate video and PowerPoint presentations into their lessons, to expose their students to video conferencing, and to promote interaction with others all over the world. South (2017) supports this by stating that it also allows students to access resources and abilities from anywhere in the world and to progress while providing access to high-quality learning materials, customised learning, and tools for future education planning. Teachers and students can share information and communicate with one another, widening perspectives for both students and teachers, improving learning, and decreasing stress. (Adu *et al*., 2013).

3.2.3 Developing Digital Citizen Skills in the ICT Classroom

Technology is no longer confined to having only a computer in the classroom; it has evolved to incorporate mobile technology, which allows students to participate in the learning process from any location and at any time. This is supported by Ferreira,

Moreira, Santos-Pereira & Durão (2015) who claim that the limitations of the classroom and the time for learning are no longer relevant because subject content can be accessed from anywhere, and this allows students to communicate with their teachers and other students at any time and from anywhere. Pegrum, Oakley Faulkner (2013) add to this by stating that mobile learning has grown in the ICT and world of education because it can cover any type of learning. Developing students' digital citizenship skills enables them to connect with other students in a different location and time in a safe, ethical, responsible, and informed manner.

According to South (2017), the ongoing use of technology needs to teach students how to be responsible digital citizens: students must be guided in developing the skills needed to use technology in meaningful, productive, respectful, and safe ways. In other words, it will aid students in practising proper online etiquette, in understanding how their personal information can be collected and used online, and in leveraging access to a global community to improve the world around them; this will prepare them to navigate their lives in a connected world successfully. To aid students to become digital citizens, resources, such as the Common-Sense Education digital citizens curriculum or the International Society for Technology in Education (ISTE) student technology standards, could be used. According to McKinney (2017), a digital citizen is someone who uses the internet responsibly, adheres to internet etiquette, and contributes to making the internet a better place for themselves and others. According to McKinney (2017), there are several things they can do to be good digital citizens, including the following:

- **Maintain the confidentiality of your personal information -** Respecting yourself is one of the first things to do. It is simple for someone to steal your personal information and commit identity theft. Make sure you understand how to protect all your personal information, such as phone numbers, addresses, and email addresses, as well as personal information that is posted, or, at the very least, with whom the information is shared.

- **Be aware of password security -** Make it as difficult as possible for someone to steal your personal information. Learn how to remember all your passwords and use a system like LastPass, or learn how to store all your password information safely in a secure app.

- **Use caution when utilising photographs -** Even the most innocent images might expose a lot of information that should not be shared on the internet. If you are taking photos, do not include any personal details. Learn how to disable geotagging functions as well, i.e. do not reveal the location of your message.
- **Make use of backup software -** Use backup software to back up all your files and data. A subscription-based, centrally hosted online backup service can preserve your files and safeguard your data against being ransomed in some way.
- **Be respectful of other people's property -** Not only for others' work but also for your own, learn about copyright, creative rights, and licensing. You can use anything that is in the public domain, but you will need permission and will need to cite the source if you utilise something that is not yours.
- **When tweeting, be courteous -** (The word “tweet” has now been included in the Oxford English Dictionary as a word meaning “to make a posting on a social networking service”.) Nobody enjoys receiving obnoxious tweets. Consider them a strong motivator to be cautious about what you tweet. Make it a point to be as “upbeat” (or cheerful and pleasant) as possible when you are online, regardless of how you are feeling.
- **Develop a personal brand -** What kind of online reputation do you want to have? Are you well-known on the internet? Everything you put out there remains there for a long time, almost eternally, and it can come back to haunt you.
- **Maintain a professional demeanour -** You are not free to act in any way you want when you are online just because you are a student. You will be looking for work once you graduate, so start acting professionally now.

3.2.4 Summary

ICT can be used to strengthen the teaching and learning process and the interaction between teachers and students because ICT is central to modern development. Teachers must, however, be taught about the technology used to integrate it successfully.

3.3 TEACHER TRAINING IN ICT

3.3.1 Introduction

This section will discuss how teachers should be trained in ICT so that they may be able to implement ICT in the classroom successfully. It will also be linked to the HoDs' instructional leadership role in using ICT to improve teaching and learning through the process of teacher training and through their access to ICT.

Innovation in education is achieved by the integration of ICT into instruction, but it depends heavily on the capacity of teachers to use ICT (Costley, 2014). According to Costley (2014), it is therefore essential for teachers to embrace and use ICTs and to use them for teaching to ensure that ICT is available to those who have diverse learning needs and potential. The usage of ICT can help teachers to update their knowledge and abilities and to access a wide range of online resources. This would also allow the teacher to learn more by changing the nature of learning and the role of the student in education and learning (Bhattacharjee & Deb, 2016).

As important as it is for students to get and develop knowledge and skills for 21st century learning, teachers must also be equipped with the skills that will ensure a positive outcome for their students. According to Robinson and Kay (2010), these are:

- Successfully aligning technologies with content and pedagogy, and developing the ability to use technologies creatively to meet specific learning needs;
- Aligning instruction with standards, particularly those standards that embody 21st century knowledge and skills;
- Balancing direct instruction strategically with project-oriented teaching methods;
- Using knowledge of child and adolescent development to prepare the educator's education policy;
- Using a range of assessment strategies to evaluate learner performance and to differentiate instruction into formative, portfolio-based, or summative forms;
- Participating actively in learning communities within the school or the school district through coaching, mentoring, knowledge-sharing, and team teaching;
- Acting as mentors and peer coaches with fellow educators;

- Using a range of strategies (such as formative assessments) to reach diverse students and to create environments that support differentiated teaching and learning; and
- Pursuing continuous learning opportunities and embracing career-long learning as professional ethics.

Teachers, according to Montrieux, Schellens, Vanderlinde and De Marez, (2015), require training in technology-related approaches and applications to encourage interactive learning and to show the development of necessary abilities to convey information optimally. Knowing content, pedagogy, and technology is insufficient. Knowledge of materials, of the unique styles of pedagogy, and of how technology can be linked to pedagogical practices that can be used in conjunction with technology, are all key concepts for the teachers to grasp.

Aside from developing proper context-specific strategies and having the necessary technology infrastructure in place, it is necessary to develop teachers' professional capacities and their support mechanisms (UNESCO, 2011). This is supported by Comi, Argentin, Gui, Origo and Pagani (2017), who state that crucial elements must be in place for the implementation of technology to be realized, such as the confidence and digital skills of both teachers and students using ICT, as well as the effectiveness of ICT in the way it is used. The discussion that follows will focus on the access to ICT and teacher professional development.

3.3.2 Access to ICT in Teacher Training

Having access to ICT, according to the Irish Teachers' National Organisation (INTO) (2017), prepares one for living in a changing world. Reading, writing, and computing skills have become increasingly important in today's world. Teachers who have access to ICT must be ICT literate and must be able to use technology to obtain, manage, integrate, assess, and produce information easily (Scott, 2015). Teachers, according to Ghavifekr and Rosdy (2015), would gain from it by learning about their future courses. Teaching and learning can be more exciting if teachers and learners use educational videos and databases, and if they use direct activities in a technology-based way, instead of limiting the curriculum and resources (Ghavifekr & Rosdy, 2015). Through ICT training, teachers can obtain access to important lessons and can be creative and fascinating, and they will then induce more student engagement.

3.3.3 Professional Development in ICT Teacher Training

The importance of teacher development, according to Voogt, Knezek and Roblin (2015), is to ensure that teachers are prepared to integrate technology in ways that promote both unique and increased learning opportunities. According to Brown (2011), the function of the HoD in teacher development is to focus not just on technology, but on what is taught by instructors, learned by students, and thus incorporated into the curriculum. The HoD can develop a range of self-evaluation strategies that can contribute to the improvements in schools, can develop approaches to professional learning, and can sustain teachers' practice as they lead and collaborate to meet the identified needs of all students, and as they manage resources pro-actively, effectively with colleagues, students, parents, and other stakeholders (Kidner, 2015). HoDs should contribute to the development of their teachers by motivating them to develop their critical thinking, communication, and collaboration, and by developing creative skills so that they may be confident when they teach them. Teachers should be trained to use technology effectively in the 21st century by motivating them, as well as supporting them. HoDs should organize professional training by offering teachers these opportunities: to gain experience; to practise; and to reflect on a variety of pedagogical approaches in support of learning and structured means of examining and strengthening pedagogical and learning settings.

Teachers can deal with the challenges that ICT presents and can develop professionally when they receive high-quality training and ongoing support. Using technology without a plan will result in haphazard skills, competition for equipment, and distraction from learning (Delorme, 2016).

The importance of discussing teacher training in ICT and professional development programmes stems from their potential to improve educational quality. Adequate training opportunities must be made available for teachers for them to become acquainted with the use of ICT and its impact on teaching and learning. Teachers must collaborate and share their knowledge and experiences with others so that they may receive help from others' abilities and experiences, which are virtual in e-learning (Al Sharija & Qablan, 2012; Kannan, Sharma & Abdullah, 2012;).

The emphasis on teachers' use of non-traditional methods and ICT for enhanced teaching and learning is clearly illustrated in the South African context by the ICT in

Education Policy, which will be discussed next in conjunction with ICT policies in selected countries.

3.4 ICT POLICY DEVELOPMENT IN THE EDUCATIONAL CONTEXT

3.4.1 Introduction

According to UNESCO (2011), education policymakers want to know the study findings that challenge the bold or exaggerated claims of technology proponents, and they also want to know about studies on the relationship between ICT and economic development. They want proof that the large financial investments required to incorporate ICT into the education system are justified, and they want to know if the use of computers improves teaching and learning.

According to Grent and Meyer (2016), in addition to policies specific to ICT in education, the broader regulatory environment influences ICT implementation in South African schools, including financial and administrative policies (for example, ThePublic Finance Management Act); government ICT and infrastructure policies (for example, The Policy on Free and Open Software Use for the South African Government); and other education-related policies (for example, The Guidelines Relating to Public School Infrastructure Planning (DBE, 2012) and The Integrated Strategic Planning Framework for Teacher Education and Development in South Africa 2011-2025 Technical Report (DBE & DHET, 2011).

The goals of ICT in education are described in broad terms and do not translate into concrete steps towards achieving them (Grent & Meyer, 2016). According to Ostrowick (2018), a lot of initiatives are unclear about what they seek to achieve in practice. Many projects are still aimed at raising student grades, but they are unable to identifya path from current reality to future success.

ICT policy development for education, according to Van Wyk (2012), is dated from 1995, when the Technology Enhanced Learning Initiative (TELI) was set up, and this was followed in 2001 by the National Ministry of Education, the Ministry of Communications, and the publication of an Information Technology Strategy in Education, laying the foundation for the 2004 White Paper on e-Education.

All the objectives of the South African National Development Plan (NDP) are facilitated by information and communication technologies (ICTs), and the White Paper lays out how the government will realise this potential. It is founded on the constitutional goals of improving the quality of life for all citizens and unleashing the potential of everyone (National Integrated ICT Policy, 2016).

The government considers that ICT (information-and-communication technology) facilitates South Africa's inclusive socio-economic transition. In the context of the White Paper, the term ICT refers to a wide range of technologies, including computing and information technology, telecommunications technology (including fixed wireless telephony and data communications), audio and audio-visual content (including broadcasting), the internet (including the services provided through this platform), and more traditional means of communication, such as letters and telephone calls (National Integrated ICT Policy, 2016).

3.4.2 The e-Education White Paper

The policy of the e-Education White Paper of the Department of Education (DoE, 2004) encourages the use of ICT in education, notably in schools. On the 26th of August 2004, the then Minister of Education released the White Paper on e-Educationwhich laid the groundwork for ICT development in South African education. The WhitePaper lays out a plan to use ICT in schools to improve teaching quality and to modernize administration and management. The White Paper's declared e-Educationpolicy goal (DoE, 2004:1) is that:

> *Every South African learner in the general and further education and training bands will be ICT capable, implying the use of ICT confidently and creatively to help develop the skills and knowledge they need to achieve personal goals and to be full participants in the global community by 2013.*

Following the announcement of the e-Education White Paper, many initiatives have been launched to help implement the policy's goals, including the following:

3.4.2.1 The Feasibility Study for an e-Education Initiative in South Africa

Following Treasury Regulation 16 of the Public Finance Management Act of 1999, the Department of Basic Education conducted a feasibility study on ICT in education in

2007-2008 (DoE, 2004). The study's goal was to create a case that could be presented to the National Treasury for added resources to be made available for large-scale ICT implementation in the education system. The feasibility study determined models of implementation for Infrastructure, Connectivity, Professional Development, Curriculum Integration, Research, and Human Resource (Van Wyk, 2012).

3.4.2.2 National e-Education Implementation Strategy (2011-2014)

Capacity was created to support the implementation of the e-Education White Paper, following DBE's Strategic Plan 2011-2014 (DBE, 2011b). The e-Education White Paper was used to develop the National Implementation Strategy for e-Education, which was supported by the country's ICT Policy Framework, and it focuses on the following six areas:

- Electronic Multimedia Resource Development and Distribution.
- ICT Professional Development for Management, Teaching, and Learning.
- ICT Teacher Development Levels.
- ICT Infrastructure.
- Connectivity.
- Research and Development.

The significant role that statistics play in realising the e-Education White Paper and the National Implementation Strategy for e-Education was recognised by the Department of Basic Education. This led to the Department of Education conducting an ICT in Education survey in 2010 to supply quality data to support and inform the implementation process (DBE, 2011b). The five focus areas outlined in the National Implementation Strategy formed the basis for the content and structure of the ICT in Education survey (Van Wyk, 2012).

The analysis of the ICT survey in education shows, according to Van Wyk (2012), that ICT in schools is more than just a technical issue. To ensure the successful integration of computers in the education system, it is necessary to consider education processes, information and technology processes, and their relationships at the levels of strategy, structure, and operations.

The South African government embraced ICT in education to provide quality education (DoE, 2004) and to restructure the educational system. The advantages of incorporating ICT include improving the applicability of learning content for individual learners, reinforcing learning, correcting for language deficiencies, expanding application options, and augmenting the spoken word (Kruger, 2010). Furthermore, ICT can provide teachers with instruments to aid adoption and make learning more open, accessible, and efficient (Makura, 2014; UNESCO, 2012).

3.4.3 Summary

The integration of educational ICT policy was created to govern teaching and learning, while also preparing students for their future in the information era. The necessity for technology and teacher training in technology use has grown increasingly vital, not only in South African classrooms, but also in formal and non-formal educational settings around the world (Van den Berg, 2017). Certain traditional teaching methods have generated a sense of security for certain teachers, and they may be discomforted if they are forced to leave that comfort zone. Even today, some teachers are hesitant to use ICT to aid learning, preferring instead to use it to transfer topic material (Kritzinger, Loock & Walaza, 2014). One of the problems that may hinder teachers' willingness to incorporate ICT is a lack of requisite skills and expertise to integrate ICT to enhance teaching and learning. Policies in ICT education can help and guide the integration of ICT in schools.

3.5 POLICIES AND PRACTICES SUPPORTING THE USE OF ICT IN EDUCATION IN A FEW OTHER COUNTRIES

3.5.1 Introduction

The notion that computers play a significant role in the lives of all citizens is no longer debatable. The introduction of ICT in schools has resulted in significant changes and challenges in education (UNESCO, 2011). In 2017, UNESCO hosted the International Forum in Qingdao, the People's Republic of China, to use ICT to achieve Sustainable Development Goals 4 (SDG4) for Education 2030 (UNESCO, 2017). The Education 2030 Incheon Declaration and Framework for Action, according to UNESCO, aims to "confirm the need to connect the power of ICT to support education systems, boost knowledge dissemination, broaden information access, advance quality and effective

learning, and ensure more effective service provision." Many nations have implemented regulations for the entry of computers into education, prompting policymakers to ensure that the rise of ICT in society, its integration into schools, and its use in teaching and learning are all coordinated (UNESCO, 2011). The concern, however, is whether added information about technology introduced in education can affect policies in educational practices that are being implemented (UNESCO, 2011).

The development of an ICT policy plan, leadership from principals, access to ICT facilities, teacher training, and the integration of ICT encouraged by national policy and implemented at schools in working with ICT are all elements that must be presentfor policies to be realized within educational practices (UNESCO, 2012). If ICT is integrated into the teaching and learning process, it becomes useful to learners, teachers, and parents, and, therefore, to the general population of the country. ICT policies can serve a variety of critical functions, including supplying a rationale, a set of goals, and a vision of how education systems should run (Ghavifekr & Rosdy, 2015).

According to Chan (2002), policy development should include, among other things, providing students with opportunities to use ICT and closing the digital divide between schools. Policies should emphasize the role and function of ICT in education, as well as its use in accessing information communication as a productivity tool. Similarly, UNESCO (2014) states that policymakers should take advantage of the potential of ICT in education.

A study conducted by the Commonwealth of Learning (COL, 2015) in African and Mediterranean countries, revealed the rich experiences they have in investigating whether and how technology can improve education access, quality, and equity. Furthermore, it proved that these countries have made significant financial, technological, and human resource investments in this process over the last two decades in a variety of ways (Isaacs, 2015). These countries have implemented national ICT policies to improve education and skill development through ICT use, and they have shown their commitment to the process. These national ICT policies in education express their goals for a national vision statement that combines investments in ICT with elevated levels of global competitiveness, economic progress, and social advancement (Isaacs, 2015).

Many countries face significant challenges in transforming technology's potential into tangible benefits for learning by ensuring that a country develops, modernizes, and recognizes the value of ICT in education (UNESCO, 2011). The effective use of technology varies by country, and, in order to develop an ICT policy in education, many variables must be considered, such as aims, availability of technologies, applications, content, and teacher capacities (UNESCO, 2011). Mndzebele (2013) added to this by saying that, for African countries to take part in the global economic environment, an educated workforce that is highly skilled in the use of ICT is essential. Promoting access to skills and competence, as well as the ability to become ICT knowledgeable, is included in policy development.

School and college graduates are expected to be technologically literate to function in a knowledge-based society (Doyle & Reading, 2012). The transfer of this knowledge and skills is dependent on the teacher's ICT ability, which includes technological and pedagogical skills, as well as subject knowledge. To function in a knowledge-based society, school and college graduates are expected to be technologically literate (Doyle & Reading, 2012). The transfer of this knowledge and skills is dependent on the teacher's ICT ability, which includes technological, pedagogical, and subject knowledge.

These developments are occurring in many countries around the world. The following section outlines what is happening in industrialized countries, such as Finland, Scotland, Australia, and African countries such as Ghana, Kenya, Mozambique, and South Africa (Koehler & Mishra, 2009). In nations like Scotland, Ghana, and South Africa, the educational policy emphasizes the crucial relevance of the inclusion of ICT in education, as well as reading, writing, and arithmetic. For teaching and learning, connecting knowledge fields with ICT is vital. Teachers' knowledge of, and ability in, the use of ICT, on the other hand, is critical because it will help as to how ICT can be used to access and teach the subject, as well as how it can support and improve learning (DBE, 2007; GDE, 2007a; Msila, 2015; Ndlovu & Lawrence, 2012).

What follows is a discussion on policies and practices on the use of ICT in primary schools within a few selected countries, from developed countries, such as Finland, Scotland, and Australia, to developing countries, such as Ghana, Kenya, Mozambique, and South Africa. The discussion includes the practices of ICT policies

concerning the integration of ICT within teaching and learning, the school infrastructure concerning the implementation of ICT, internet access within schools, school principals as leaders of ICT, the role of teachers in the use of ICT within schools, and the need for professional development and human capital. This is done to note the impact that policies and practices have on creating favourable conditions to improve the situation for setting up regulations to allow the allocation of learning resources to technology-based education.

The countries covered in this study's ICT in the education policies section focus strongly on promoting access to ICT, as well as reaching specified ICT access targets related to ICT. The policies that these countries have adopted articulate their commitment to improving education and skills development through ICT. Twenty countries have adopted national ICT policies that express, in diverse ways, their commitment to improving education and skills development through ICT.

Furthermore, according to Isaacs (2015), only nine countries have dedicated ICT policies in education, some of which are in draft form and those that do not have specific policies have dedicated strategies for implementing ICT policies within education. Each of these policies highlights the importance of growing past the dominant agricultural, commodity-based economies and becoming knowledge-based economies (Isaacs, 2015). The focus of this discussion is on the promotion of ICT literacy and the use of ICT to support curriculum coverage (Isaacs, 2015), and the discussion begins with developed countries, such as Finland, Scotland, and Australia.

3.5.2 Finland

Within the last year, education policies have placed a strong emphasis on the digitalization of the education system at all levels, and they have increased the use of ICT in teaching and in the communication infrastructure. Similarly, Finland's education, according to Koikkalainen *et al.* (2016), is viewed as one of the fundamental rights of all citizens within the country, and its education system offers equal rights to all, despite age, domicile, financial situation, or native language. Both public and private education and training are publicly funded, with no tuition fees at any level ofeducation. The Finnish education system focuses on learning rather than testing, withno national high-stakes tests for students in basic education (Finnish National Board of Education,

2015). According to the Finnish National Board of Education (2014), ICT is integrated within the national curriculum as a cross-curricular topic in all subjects. The Minister of Education and Culture also tends to refer to *the digital leap*, implying that schools within Finland should modernise their ICT infrastructures within schools with tablets and smart boards (Saari & Santti, 2017). The Finnish National Board further supports the view that digital literacy also has a position within media literacy, which in turn has a link within the national curriculum. Unlike many countries, students in Finland can enjoy outstanding technological equipment and internet connectivity, and, also unlike in other countries, Finland has teachers who are highly educated and who need a minimum of a master's degree in education for most levels (Lappi & Paronen, 2018). Similarly, the government is also willing to fund in-service training to encourage innovative uses of ICT in teaching (Saari & Santti, 2017).

Like all countries globally that have introduced ICT policies in education to improve teaching and learning to be at the edge of global competitiveness, Finland is forging ahead to digitalise its education system (Saari & Santti, 2017). Just as much as Finland has followed the international trend with regards to the development of ICT policies within education, it has also been set apart as an example of what works within an education system: Finland's high-quality teacher education and its appreciation of its teachers and schooling, in general, have been contributing factors behind Finland's PISA miracle (Saari & Santti, 2017). The PISA (International Student Assessment) has created a new geography of education policies and reforms by shifting global interest away from the Anglo-Saxon education system to Asian countries, as well as to Finland and Canada in the West. This has led to Finland's educational success due to the results of various comparative studies of educational attainment in its comprehensive schools. The PISA project consisted of assessing 15-year-old students in thirty-two countries and the results showed that Finnish students were amongst the best with regards to reading and mathematical and scientific literacy (Rusitoru, 2018).

3.5.3 Scotland

The purpose of the Scottish government's implementation of ICT within the education system is to prepare students to be successful in a rapidly evolving digital world and to allow them to develop ICT skills that will support them in their education, lifestyles, and the world of work (Kidner, 2015). The aim of the Scottish policy can be realised

by having ICT regularly and efficiently embedded within all aspects of learning and teaching.

Policymakers and education departments within Scotland have prioritised the implementation of managed services and the development of programmes for ICT provision, and this has led to the focus of five key areas: infrastructure, proper technologies, good pedagogical practice, school leadership, and professional learning for the full and successful ICT integration into teaching and learning (Kidner, 2015). In conjunction with these key areas, schools are provided with guidelines on proper measures to ensure the mitigation of risk and compliance with council ICT policies (Kidner, 2015).

Set out in the ICT policy, Scotland's national intranet for schools, Glow, is available to all schools, providing teachers and students with personalised access to the intranet, virtual learning, and a variety of tools to enable collaboration, cooperation, and communication across the network. The Curriculum for Excellence and Aruba Wireless is available in all schools, supplying internet access for both teachers and students throughout the establishment (The Highland Council, 2015:7).

The Scottish Education Department recognises the importance of teachers for the effective and efficient use of ICT in teaching and learning (Wilson & McKinney, 2012). This has led to the establishment of the Curriculum and Technology (CaT) Coach model, ensuring that teachers become confident and competent in integrating technology within their teaching activities. The Scottish Education Department has therefore also begun offering programmes for the continuous development of ICT skills for teachers to allow them to integrate technology in their daily classroom practice and to keep up to date with new developments.

3.5.4 Australia

A country that has also contributed to change within education through the introduction of ICT is Australia, which is looking to contribute to lasting and meaningful educational reforms in its schools in the same way as the above-mentioned countries with their digital education revolution.

According to Stoilescu (2017), Australia, a developed country and part of the Commonwealth (COL, 2015), has an advanced technological level, as well as a very sustainable internet infrastructure (Schrum *et al.,* 2015). The education system within Australia is decentralised, with the states taking responsibility for organising the educational settings with Australia, as a federal system, giving the primary responsibility for educational administration to the states and territories. The staff, teacher qualifications, infrastructure, equipment, and funding are included in this responsibility. Attempts to coordinate policies at the national level have, however, increased through the leadership of the Council of Australian Governments (Stoilescu, 2015).

In 2007, the education system was revolutionised, promoting reform in the curriculum, assessment, reporting, teaching quality, and leadership, as well as working towards greater equity and rewards for performance and infrastructure (Thomson, 2015). Furthermore, the use of digital technology in Australia has increased steadily, with computer use rising from 91 per cent in 2000 to 99 per cent in 2013 (Thomson, 2015). Similarly, within the period between 2008 and 2012, computers were introduced into all Australian schools, and this contributed to raising the attainment of students and allowing them to get the knowledge and skills to take part effectively in society (Thomson, 2015). This initiative was supported by the promulgation of the ICT Policy in Education in 2008, which emphasised the promotion of teaching and learning with technology.

In 2017, the New South Wales (NSW) Education Standards Authority (NESA) reviewed the teacher preparation programmes, making information and communication technology (ICT) a priority. This means that the use of ICT within teaching and learning is regarded as an important skill for teachers, allowing them to design programmes and lessons that meet the requirements of the curriculum, assessment, and reporting, and that ensure that teachers integrate technology into their teaching, thus helping learners' learning. To support this, the Australian Government announced that they were offering a grant to improve digital literacy within schools; these grants support schools and help teachers to display newmethods for improving digital literacy in schools (NESA, 2017).

The ICT policies implemented in these countries will now be compared with those implemented in the countries of Ghana, Kenya, Mozambique, and South Africa, all of

which fall within the African region of the Commonwealth and are considered to be developing countries.

3.5.5 Ghana

The Ghanaian government in 1995 adopted a 2020 Vision within Ghana leading to supplying a national framework for Ghana's economic and social development in decades to follow. In 2003, Ghana adopted an ICT policy that provided a framework and plan for the implementation of ICT and for achieving the national goal by transforming Ghana into an "information and knowledge-driven, ICT literate nation". The policy outlined fourteen strategic pillars of intervention, including the education pillar, and this led to the Ministry of Education adopting a National ICT in Education policy in 2008 (Isaacs, 2015). This policy is supported by four key pillars relating to the promotion of equity, capacity building, access to ICT infrastructure, and norms and standards (Isaacs, 2015).

Through its ICT for Accelerated Development (ICT4AD) policy, the Ghanaian government emphasised the use of ICT to bridge the digital divide between Ghana and the developed world (Muhkari, 2016). The purpose of ICT within education was to improve the quality of education and training and to make the education system responsive to the needs and requirements of the economy and society concerning the development of information and knowledge-based economy and society (Ghanaian MoE, 2015:10; Mangesi, 2007:3). This led to the Ghanaian Ministry of Education (MoE) emphasising the importance of the introduction of ICT at a pre-tertiary level to improve teaching and learning and teach ICT skills to students in preparing them for future ICT professions (Ghanaian MoE, 2015).

The development of the ICT policy, apart from showing the government's commitment, also suggests a systematic and collaborative plan, focusing on providing ICT with internet connections within all schools, developing teacher confidence and ICT competence through professional development programmes, and encouraging stakeholders to collaborate in the successful integration of ICT in education (Ghanaian MoE, 2015).

The development of policy is not, however, without challenges, as it is dependent on financial and technical support from international partners, since this dependence could cause the project to stop before it even started. It also lacks policy direction

within the schools and the districts, and, at a national level, about the integration of ICT within education, and this lack of policy direction could result in both principals and teachers having no clear direction in knowing what to do (Makgato, 2012; & Mdlongwa, 2012). Further challenges, named by Krauss and Nkula (2014) and Malcolm and Godwyll (2008), are the lack of professional development programmes updating teachers on the new technological developments, as well as the inability of ICT coordinators to keep ICT equipment while supporting teachers, students, and administrators. The poor integration of ICT within teaching and learning has resulted in teachers lacking ICT skills, which links up with the lack of programmes for professional development (Krauss & Nkula, 2014).

The challenges faced by the Ghanaian government in implementing policy development and integration of ICT within education show a lack of collaboration between the various stakeholders in realising this initiative. It, therefore, falls on the government to formulate a plan, allowing teachers to become ICT competent, supplying clear direction on how to integrate it as well as ensuring that funds are available (Ghanaian MoE, 2015; Mangesi, 2007). According to Isaacs (2015), recent reports have shown that the use of ICT within schools has focused little on using ICT effectively to support teaching and learning. As a result, Ghana's policies have also been found to be outdated, and they do not consider the many changes that have occurred in technology-enhanced learning spaces.

3.5.6 Kenya

Kenya, like Ghana, adopted an ICT policy in 2003, which had, as its purpose, the transformation of the country into a knowledge-driven, ICT-literate nation. Kenya, in 2007, adopted the 2020 Vision for Kenya, aimed at accelerating sustainable growth, reducing inequality, and managing scarce resources, and it named education as a key pillar of the country's growth and development (Isaacs, 2015). A commitment made by the country includes supplying globally competitive education, training, and research, which would lead to it becoming a centre of research and development in innovative technologies (Republic of Kenya, 2007).

In 2015, the Kenyan Government adopted the National ICT Master Plan 2014 to 2017, which named ICT and human capital development as critical pillars in the growth and

sustainability of Kenya's ICT sector. In 2006, a National ICT Strategy for Education and Training had developed, which outlined key areas of an intervention to promote access to ICT in education, teacher training and development, development of digital content, and the establishment of education management and information systems (Isaacs, 2015).

In recent years, Kenya has been the focus of innovation where young people, such as upcoming ICT entrepreneurs, have developed new digital products that can serve the needs of the Kenyan population. The challenges faced by Kenya are, however, being constrained by unreliable internet access and insufficient human resource capacity, both in the public and private sectors (Isaacs, 2015).

3.5.7 Mozambique

Mozambique has been at the forefront of promoting ICT in education within Africa by setting up an ICT commission in 1998 to develop a national ICT policy, as well as creating an enabling environment supporting further investment in ICT in various sectors, including education. It is important to note that Mozambique was the first African country to have developed a national ICT policy, with its existing policy being adopted in 2002, together with an implementation strategy, focusing on digital inclusion, not just on access to ICT, but also on how people can use ICT to improve their lives. Furthermore, with its implementation plan including thirty-seven different projects and showing signs of having made some gain in education, the policy includes equipping secondary schools with computers through the School Net programme, navigating both an ICT curriculum for secondary schools and university-level distance education, as well as growing private-sector computer courses and activities (Isaacs, 2015). Yet, like some of the countries previously mentioned, Mozambique lacks a dedicated ICT in Education Policy and is challenged by the limited human resource capacity, is dependent on donations, and is constrained by ICT infrastructures (Isaacs, 2015).

The government of Mozambique has, however, developed a long-term framework and vision for economic growth and development referred to as Agenda 2025. One of its aims is to recognise the need to strengthen the country's success in literacy and schooling, as well as improving the quality of teacher training (Committee of

Councillors, 2003). UNESCO (2015) states that one of the country's aims is to set up an e-school model that will align learners' competence with a new national curriculum and make online information available on management administration to enhance communication between the local community and schools to strengthen the ICT-enhanced education management and information systems (EMIS). The provision of online distance learning (ODL), which moves from a paper-based model to a blended learning model, is intended to create an ecosystem that fosters knowledge societies and that aligns with Sustainable Development Goals (SDG) in order to improve the ICT in Education Policy.

The countries discussed thus far have changed their education system with the development and introduction of ICT and its related policies. To achieve the best conditions for the development of digital skills, the policies created should function as a supportive framework for teaching and learning. The international experience about ICT policies and the effective use of technology within education, as shown by UNESCO (2011), varies, however, from country to country.

3.5.8 Summary

Technology has become important in all aspects of societal and individual life. Education systems need to exploit this situation and its potential for teaching and learning by finding ways for both teachers and students to receive help from ICT for communication, learning, and knowledge sharing. Teachers are thus important for the provision of excellent quality education as they are key facilitators of learning. It is important to supply in-service professional development programmes for teachers, particularly through blended training strategies and modalities (UNESCO, 2014).
ICT policies and ICT implementation in South Africa are discussed in the later section.

3.6 POLICIES AND PRACTICES SUPPORTING THE USE OF ICT IN EDUCATION IN SOUTH AFRICA

The South African government, through the introduction of Operation Phakisa, a fast results delivery programme, has realised the importance of integrating ICT within the education system to achieve its national ICT education goals, and this has produced ethical, discerning, and responsible ICT users who would be making a meaningful contribution to South African society. The use of ICT within schools in South Africa focuses on teachers' use of non-traditional methods and the use of ICT to improve

teaching and learning: this is shown in the ICT in Education policies (Sipilä, 2014).In 2003, the White Paper on ICT in Education emphasized the need for ICT and its availability. The purpose of the White Paper was to encourage collaboration with stakeholders about investment. The e-Education policy's goal and purpose were summarised in this statement:

> *Every South African learner/student will be ICT capable, using ICT confidently and creatively to help them develop the skills and knowledge they need to achieve personal goals and to be full participants in the global community by 2013* (Adu & Galloway, 2015).

According to Botha (2013), the South African government was intent on limiting the barriers and overcoming the challenges faced by ICT integration in schools. The White Paper on e-Education (DoE, 2004) and the teacher laptop initiative (DBE, 2009) were some of the policies intended to support teachers and schools in using ICT. In addition, as early as 2003, Gauteng Online was being rolled out to schools to provide all schools in the province with many computers (Burrows, 2003). Mdlongwa (2012) reports that, in adopting measures to ensure the use of ICT within schools, the national Department of Basic Education (DBE) and the Department of Higher Education and Training (DHET) saw ICT as a means of enhancing education in South Africa. According to Meyer and Gent (2016), the introduction of ICT within South African schools was undertaken by many role players, such as non-governmental organisations (NGOs) and research institutions, as well as provincial and national departments of education, which are also seen as the long-term custodians of this involvement. Operation Phakisa developed a national vision for ICT within education, defining six pillars upon which the vision will be executed (Meyer & Gent, 2016). The South African education system has, however, for many years, faced severe challenges, such as schools with poor infrastructure, low pass rates at matric level, high dropout rates, and elevated levels of absenteeism by teachers. A way to overcome these challenges was through the implementation of ICT in the teaching and learning process.

Schools within South Africa have used traditional methods of teaching, even though the policy has shown the need for a move to a more learner-centred inquiry approach that incorporates the use of technology. The lack of ICT being implemented in the teaching and learning process in schools has, however, caused problems: South

Africa has not closed the digital divide, which is referred to as the gap between those individuals who receive help from digital technology and those who do not (Mdlongwa, 2012:2). By using ICT within schools, some of the challenges could be overcome by improving the efficiency and productivity of both teaching and learning, resulting in a narrowing of the digital divide (Mdlongwa, 2012). To close the digital divide, the South African government introduced a range of measures, depicted below:

- In 2001, the Presidential National Commission on Information Society and Development (PNC on ISAD) was set up. The commission included members of both the public and private sectors, and its main goal was to function as an advisory group to the government on challenges about ICT development in South Africa and how the country could address these challenges to be globally competitive.
- The Electronic and Communications Transaction Act, No. 25 of 2002, was set up by the Department of Communication (DoC) in a bid to lead all ICT initiatives in South Africa and to develop a five-year national e-strategy that would empower all citizens, especially the education sector.
- Many initiatives, both legislative and to do with policy, have been undertaken by various government departments to support the integration of ICT into teaching and learning.

By introducing these measures, the South African government, in 2012, with the help of the Department of Education, hosted a National ICT Policy Colloquium. The purpose of the colloquium was to start reviewing all government policies in existence since 1994. The Department of Education held an ICT Indaba in Cape Town in June 2012, bringing together various stakeholders from different sectors, such as business, labour, academic, and civil society across Africa and the world. This was done to ensure that South Africa develops and improves its ICT capability in the future (Mdlongwa, 2012).

The integration of ICT into the educational system has led to the acknowledgement of ICT as a fundamental part of society and a crucial component in improving the country's educational system. As a result, the Department of Basic Education (DBE) and the Gauteng Department of Education (GDE) have emphasised the significance of using ICT in teaching and learning to correct historical inequality (Costley, 2014).

To reform the school system, the Gauteng province has implemented the usage of ICT. The Gauteng province used ICT to teach and train students so that they could compete globally (Costley, 2014). The rationale for integrating ICT was that it has the potential to improve educational skills across the curriculum by enhancing and speeding up teaching and learning (Livingstone, 2012). As a result, policies were developed and ICT became a priority for educational and societal purposes.

According to Meyer and Gent (2016), for technology to have a long-term influence, it must support the educational process to have the desired effect on educational outcomes: this suggests that technology must be used correctly. This is also linked to the right use of technological tools in the learning process to improve it by adding value to the education of learners, such as remembering, understanding, applying, assessing, and producing. ICT not only supports a model of teaching and learning, but it also helps the functioning of the education system, a primarily transactional role, allowing the system to work more successfully.

Mdlongwa (2012) states that using ICT might not be a cure for the problems within education, but despite the challenges in implementing or introducing ICT into schools, research has shown that the use of ICT can influence and improve productivity and efficiency of the teaching and learning process. It seems pertinent to remember that the use of ICT in schools will not just improve teaching and learning, but will also give people within South Africa a reasonable advantage in managing and competing in an ever-demanding 21st century labour market and thereby finding solutions to Africa's developmental challenges (Mdlongwa, 2012).

To complete the section on ICT in Education Policies in selected countries, the discussion on the development of ICT policies within the education systems of Finland, Scotland, Australia, Ghana, Kenya, Mozambique, and South Africa, was an attempt to compare and to determine whether the integration of ICT has been supported by policies and how these were developed within these different countries, and to determine how it has affected certain areas and specific roles, as well as the changes it brought about. The ICT in education policies of the different countries is illustrated in Table 3.1.

Table 3.1: Summary of education policies on the use of ICTs within a primary school in selected countries

Policy stipulations	Finland	Scotland	Australia	Ghana	Kenya	Mozambique	South Africa
The rationale for ICT integration	The use of technology in education. Incorporating ICT skills and digital literacy into teacher education for all teachers.	Preparing students for success in a rapidly changing and digital world.	Australian states and territories are primarily responsible for educational administration, which includes staff, teachers.	Founded to bridge Ghana's digital divide with the developed world. Creation of knowledge-based-focused learning.	Focused on improving the quality of learning outcomes.	Government at the forefront of promoting ICT in education.	ICT is a resource for reorganising schooling and a tool for the whole school's development. Enabling more people to learn
ICT Infrastructure	The country has an elevated level of ICT.	Non-will endorsement supports them in textual approaches. Ensuring adequate ICT resources are available for innovative teaching opportunities and qualifications. Keeping digital technology growth.	Qualifications. Continued growth in digital technology.	The Ghanaian Ministry of Education supplies ICT facilities in all schools.	ICT plays a critical role in education's effectiveness, efficiency, and service delivery, as well as its adoption in schools.	ICT infrastructure constraints, but improvement since the adoption of national policy.	Opportunities: Although GDE established computer laboratories and supplied tablet computers, they are insufficient for students and teachers.

Policy stipulations	Finland	Scotland	Australia	Ghana	Kenya	Mozambique	South Africa
Internet Access	Excellent technological equipment and internet connectivity.	Students have access to effective learning through the intranet and the internet to obtain information and communicate. Increasing learner attainment, because connectivity is a universal phenomenon.	Connectivity is universal.	The Ghanaian Ministry of Education supplies internet connections.	Kenya has issued a government policy to improve the availability of dependable, efficient and affordable ICT services.		Tablets are not being used. The GDE established a goal for the provision of internet connections. Internet access is available on tablets.
School Principals as ICT Leaders	ICT leadership is well-equipped.	To access technology, CT leadership is well-equipped.	School principals are key figures in ensuring the success of ICT integration in schools. Making use of the online Head Teacher Toolkit.	Principals lack ICT leadership skills. • There is a lack of policy direction. • There is a lack of school-based ICT policies. Most school principals lack the skills to model ICT leadership in their schools.		Principals lack ICT leadership skills. Lack of policy direction.	Most of the school principals lack the skills to model ICT leadership in their schools. Lack of school-based ICT policies.

Policy stipulations	Finland	Scotland	Australia	Ghana	Kenya	Mozambique	South Africa
Role of Teachers	It has become a priority in improving teachers' competence in ICT.	Teachers are critical for successful ICT integration in teaching and learning.	Teachers are essential for supplying the necessary information for successful ICT integration in teaching and learning.	Teachers are acknowledged as key figures in the integration of ICT for teaching and learning, but the lack of ICT skills among teachers is a major problem.	Teachers lack skills, confidence, and pedagogical Training.	Teachers lack formal training.	The integration of ICT's education policy depends on teachers; but many teachers lack the necessary ICT skills.
Professional Development	Minister of Education and Culture doubled the funding for teachers to attend in-service training.	Teacher development is an essential element in providing teachers with the skills they need to become ICT literate.	Teacher development is undertaken to enable teachers to develop ICT skills for use in the classroom and to keep teachers abreast of new technologies.	Lack of professional development programmes.	The government is concentrating on improving teacher skills and pedagogy. Emphasis on training requirements.	Lack of professional development programmes.	Education policy on ICTs emphasises programmes for teachers' professional development; however, there are negative attitudes towards ICT.
Human Capital	All education providers oversee all practical teaching arrangements and check the effectiveness and	All stakeholders contribute to ensuring students are computer literate.	All stakeholders (teachers, education authorities, support staff, and parents) contribute to	All stakeholders (teachers, education authorities, support staff, and parents) contribute to	Insufficient human resources in both the public and private sectors.	Lacks a dedicated ICT in education policy and is still challenged by limited human resource ability	All stakeholders are expected to collaborate to ensure the successful integration of

Policy stipulations	Finland	Scotland	Australia	Ghana	Kenya	Mozambique	South Africa
	quality of education provided.		ensuring that students buy ICT skills that will make them employable, even if they drop out of school.	ensuring that students buy ICT skills that will make them employable, even if they drop out of school.		and the reliance on donor aid for ICT.	ICTs in teaching and learning.

The development of policies about ICT within teaching and learning is a pursuit of developing ICT-competent teachers and students who are more active, creative, and knowledgeable, and who will be able to function in a knowledge society. The comparison between the countries mentioned illustrates the attempts made in developing ICT policies within the education system, as well as the challenges these countries face in realising these attempts. The same could be said about the South African situation and its attempts to realize these policies. South Africa has developed policies about the use of ICT within teaching and learning, but it is faced with just as many challenges as the countries mentioned. Throughout the years, there has been no shortage of government policies outlining ambitious plans to include ICT in education. Many of these, however, did not come to fruition as they did not deliver on their promise of support (ITNO, 2017).

The failure of these policies has led to insufficient ability, which has prevented teachers from using ICT to enhance the teaching and learning process. The policies lack guidelines and direction, as well as instruction on how teachers are to be equipped with the skills needed to become ICT competent. Although pilot schools within South Africa are successful in the implementation of ICT, the same cannot be said about all schools within South Africa. Although many schools are equipped with computers, they face challenges, such as computers being old and unusable, not enough for all, not being compatible with the newer types of computers, and not being able to be upgraded with new software, in addition to connectivity challenges and maintenance. In discussing the policies and practices surrounding the use of ICT within South African schools, what follows are the functions of ICT within South African primary schools.

3.7 ICT RESOURCES AND FUNCTIONS IN SOUTH AFRICAN PRIMARY SCHOOLS

The use of ICT within schools offers major opportunities, such as changing the teaching and learning process and leading to a more involved learning experience. A condition for the distribution and use of ICT is having access to equipment, networks, and quality resources. The integration of ICT within education requires a supportive environment (UNESCO, 2011). The integration of ICT within the teaching and

learning process will, according to Ferreira, Moreira, Pereira & Durão (*2*015), supply ways to build learner knowledge. These changes, however, are not only limited to the classroom. The introduction of distance and e-learning offers new options for the delivery of subject content (UNESCO, 2011). It can, according to Costley (2014), have a positive effect on learners' learning, allowing them to become more engaged,and this will cause them to remember more information and, thereby, supply a more meaningful learning experience.

Technology, according to Kennah (2016), has progressively become an important part of the daily functioning of companies. The world is a global village using ICT in different educational, political, economic, and social sectors (Ajayi, 2008). Teachers, therefore, need to prepare and familiarize themselves with the changes to their teaching pedagogy that need to be made with the use of ICT (Voogt, 2013). The use of ICT within schools refers to all types of devices, such as computers, tablets, smartphones, interactive whiteboards, broadband, and Wi-Fi, as well as software, such as educational games and adaptive digital learning tools, and all educational applications found on the internet (Haelermans, 2017). As a tool, technology can be used to restructure and redesign the classroom: this will create an environment that will encourage and develop learners' higher order thinking skills (Costley, 2014).

According to the Kennisnet Strategic Plan (2015-2018), ICT in education plays a significant role in achieving the aims of education. The question can no longer be asked if education will make use of ICT, but how ICT can help improve education. Coffey (2012) states that being familiar with ICT and having the skills to use digital technology is crucial. In schools, the use of textbooks and diverse types of materials used in classrooms play an extremely key role in learning. For this purpose, textbooks, materials, and information stations, important to learning, need to be developed in a manner to help foster abilities needed for 21st century learners.

ICT resources that can be used within schools could include, amongst others, the interactive whiteboard (IWB). As the state says, the use of the interactive whiteboard or smartboard within the classroom tends to have replaced the traditional chalk or whiteboard (Haelermans, 2017). The interactive whiteboard can be connected to a school network and used to interact with internet resources. The interactive whiteboard allows the teacher to use the display as a touchscreen device, allowing differentiated

and collaborative learning to take place. This allows the teacher to speak more directly with the students, provide more learning materials, and encourage students to engage in more independent learning. The usage of an interactive whiteboard also cuts down on the teacher's preparation time and allows them to spend more time explaining concepts to students. Smartboards are used in conjunction with research, allowing the teacher to build links, access materials, and incorporate instructional videos into the class.

Dias and Victor (2017) state that the interactive whiteboard helps teachers create interactive presentations with animations and effects and allows them to present lessons, check progress, and stay organised. Lari (2014) adds that the use of technology within the classroom improves learning by supplying a better understanding of the topic, as well as motivating learners. Lari continues by saying that teachers can use technology in the classroom by attracting the learner's attention, thereby enhancing effective ways of learning. Likewise, Ozaslan and Maden (2013) add that students can learn better when the course material is presented through some visual tools, turning a typical classroom into a fun learning environment.

Using ICT, the classroom can become multimodal where multimedia becomes part of the teacher's toolkit: the teacher can use YouTube videos to improve history, geography, or science lessons, Google Maps to bring geography to life, and videos to enhance music lessons, all of which could become commonplace within the classroom (INTO, 2017). The learning environment needs to reflect these changes. As the tools of teaching have begun to evolve, so too should the teaching methods. The way teachers teach and students learn has gradually changed, along with teaching tools and resources. Where teachers previously used chalk and blackboards, they are now able to use projectors, PowerPoint presentations, and interactive whiteboards.

There are countless benefits to using an interactive whiteboard, such as enhancing teaching and learning experiences by using a wide variety of learning approaches. Interactive whiteboards offer access to online information and tools and allow many different forms of media to be used during the lessons, which could include photos, videos, and games. This does not only enrich the classroom experience but also expands the nature of the content. In addition, the use of the interactive whiteboard

allows students the opportunity to share, interact, and take part in the teaching process (Lotter, 2019).

In terms of benefits to the teacher, the ability of technology integration means that they can attach tools to the board, which also allows for connections in separate locations. Interactive whiteboards are neat and easy to use, once training has been done, and they are considered to require limited maintenance. Finally, interactive whiteboards are also environmentally friendly (Lotter, 2019).

According to Groff (2013), technology should not just be part of a resource, but, much more, it should play a leading role in all the foundations of the teaching and learning environment. Technology, Groff (2013) continues, can reshape both the learner and the teacher and give access to new knowledge, which might previously have been less accessible. Groff (2013) further states that technology can empower students to conduct research projects, collaborate, and conduct learning both in and outside the school limits, as well as to inquire about projects with other schools situated internationally.

Using ICT for research purposes allows teachers to make use of a variety of methods at any given time and to feel less stressed while performing their educational duties (Adu & Okeke, 2014). ICT also allows the learner to become an active researcher by looking for information from diverse sources and by becoming more informed on the subject matter (Bhattacharjee & Deb, 2016). Alluhaydan (2016) affirms this by saying that technology is also able to help the teacher access different sites when planning lessons, lectures, exchanging ideas, getting information to add to the lesson, and reducing the usual stereotypes. Alluhaydan (2016) continues that the use of technology could allow the learning process to shift from a teacher-centre to a learner-centre model, thereby allowing the teacher to have less authority and transferring the role of the teacher from being the centre to the guide, and teaching students to ask questions and form hypotheses.

Technology within the teaching and learning process supplies opportunities for both students and teachers. It offers access to a massive collection of information, such as digital libraries and data analysis; it also connects with other people who can supply information and give feedback and inspiration. In today’s world, with the huge

advances being made in technology, it is imperative to ensure that students are equipped with 21st century skills to take their place in society. The most efficient way to do this is through technology-based education.

3.8 CONCLUSION

This chapter reviewed the use of ICT in classrooms, the policies which support its use, and the practices, as well as the role of ICT in the teaching and learning process, with an emphasis on its possibilities to change the education landscape to produce ICT-capable students and teachers. The chapter focused on ICT education policies in well-resourced developed countries and less-resourced developing countries. Policy is fundamental for the advanced use of ICT, but it requires careful planning and preparation to allow all prerequisites to be in place for the use of ICT to be successful. The chapter also highlighted the levels of professional development needed to help teachers to learn to use ICT within their teaching and learning. This chapter also served to answer the research question for the study by naming the functions and benefits of ICT, and it outlined the role that the head of the department plays as an instructional leader in this process.

Next, the research design and method will be presented in chapter four. This chapter focuses on the research design, sampling procedures, instrumentation, data collection procedures, and data analysis. Finally, the chapter will discuss the ethical implications of the research.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 INTRODUCTION

The previous two chapters dealt with literature reviews on certain concepts relating to the study. This chapter discusses the methodological framework for the study and includes the research paradigm, the approach and design, sampling procedures, instrumentation, data collection techniques, and data analysis. The chapter concludes with a discussion of the ethical implications of the research, the limitations of the study, and the contribution of the study towards theory and practice.

The study aimed to investigate the HoDs' role as instructional leaders in enhancing the use of technological education in South African primary schools. The main research question in Chapter 1 was: **What is the role of the Head of the Department in the primary classroom in South Africa in improving the use of technology-based education?** This main question was divided into the following sub-questions:

- What is the concept of the 21st century classroom?
- How can the HoD contribute to the effectiveness and improve the use of technology in the 21st century classroom?
- What is the role of the HoD in designing, implementing, and maintaining an effective technology model for the 21st century classroom?
- Which instructional leadership skills does the HoD, as an instructional leader, need to effectively lead teams and teachers?
- What strategy model could be implemented by the HoD to enhance the use of technology within the 21st century classroom?

4.2 THE RESEARCH DESIGN

The research design is defined as a set of conditions for data collection and analysis that aims to combine relevance to the research purpose with economy and procedure (Akhtar, 2016). A research design can also be defined as a set of procedures for conducting a study. Research entails a process of searching for and analysing existing information to explain the topic under study. Simply put, the research design is the

plan that guides, details the process and instruments used, and systematically answers the research question so that the data collection process may achieve the research aims (McMillan & Schumacher, 2010). The study design aims to ensure that the data gathered can address the research issue (Creswell, 2018).

Creswell and Creswell (2018) define research design as a type of investigation that uses a specific research approach, whether qualitative, quantitative, or mixed methods, to present a clear direction for the research process in a specific study. The case study approach will be used in this study because it will allow the researcher to study the data within a specific context while focusing on a small number of participants. According to Gustafsson (2017), a case study is an intensive study of a person, a group of people, or a unit that will lead to a generalization with other units.

Case studies are described as a separate and all-encompassing research method by Yin (2014:16). He also defines it as *an empirical investigation into a current phenomenon (the 'case') in-depth and within its real-world context*. Case studies are useful for describing, contrasting, evaluating, and understanding various aspects of a research problem. A case study is also relevant as a research design because it allows the researcher to gain real-world, contextual, and in-depth knowledge about a specific subject. It also enables the researcher to investigate the key characteristics, meanings, and implications of the research question. As a result, a case study is used in this study to gain in-depth information about the role of the HoD as an instructional leader in the use of ICT in the classroom. School activities are complex, and all those who take part in the study will help to achieve the study's aims and to supply a detailed explanation of the interaction between teachers and HoDs.

A case study has the advantage of requiring a sample with a limited number of participants, making it a cost-effective method of data collection. The data gathered from a variety of research methods, such as interviews, observations, and analyses of documents, transform useful data into factual opinions (Creswell, 2018). On the other hand, the use of case studies has many disadvantages. The tiny sample size needs to be effective in a case study. The data collection process is labour-intensive, and it takes more time to analyse the data. There could be issues, such as influence on data factors, which could result in an ineffective process (Creswell, 2018). Even though case studies have some disadvantages, they can still be used successfully in real-life situations, issues, and problems. Thus, their use in this study was considered proper because it would research issues with which the participants deal every day.

4.3 THE RESEARCH PARADIGM

A research paradigm is a loose collection of logically related assumptions, notions, or propositions that govern cognition and study (Riyami, 2015). It is also defined as a collection of common views among academics about how to interpret research challenges, how to view the world, and how to do research. Valid research may be described as a process that uses a research paradigm, which is a set of beliefs that guide the investigation (Rahi, 2017).

A hermeneutics approach, an interpretive strategy that challenges the nature of relations between different kinds of knowledge and what can in fact be known, and what the nature of reality is, will be employed in this study theory (Tracy, 2013). This paradigm will aid researchers in better comprehending and characterizing human nature by allowing them to interact with members of their natural surroundings. In conversation with the participants, the researchers can create a bond between the knowledgeable and the familiar and can use their ability to understand the issue better and to put fresh information together by conversing with them (Tracy, 2013). The study used a hermeneutic interpretative paradigm to investigate the role of the HoD in primary classroom teaching in South Africa in using technology to improve technology-based education.

4.4 THE RESEARCH APPROACH

A research approach is a set of plans and procedures for a study. When gathering data, a researcher can take one of three approaches: quantitative research methods, qualitative research methods, and a mixed-methods approach. These methods collect and analyse data using a variety of research methods, and they allow participants to respond to a wide range of questions (Creswell, 2003).

Quantitative research may confirm or refute theories and assumptions. Experiments, surveys, or questionnaires with closed, multiple-choice questions could be used to conduct this. It makes use of a large sampling group, allowing for many people to be included in the study. The collected data is statistically and mathematically analysed. Tables, numbers, and graphs are used to present the results numerically (Creswell, 2003).

Qualitative research, on the other hand, is a method of investigating and understanding the meaning that individuals or groups ascribe to a social or human problem. It also uses words to understand concepts, thoughts, or experiences, and it allows the researcher to gain in-depth insights into issues or topics that are not well understood. It makes use of a smaller sample size. Open-ended questions are used in interviews or questionnaires. The collected data is analysed by classifying, categorizing, and interpreting it, and the findings are documented (Creswell, 2003). A mixed methods research method, on the other hand, employs both a qualitative and quantitative approach to data gathering, thereby integrating the two forms of data and adopting a design that has a philosophical premise and a theoretical framework.

The qualitative research approach was used in this study because it incorporates people's motivations, emotions, prejudices, incidents of interpersonal cooperation, and conflict: this allows the researcher to become acquainted with the participants' world, and it assists the researcher in understanding their use of technology in the classroom and the leadership skills required by the HoD during this process (Gray, 2014).

This study makes use of many key qualitative research characteristics. It can be used as a data generation approach for studying people's attitudes, behaviours, meanings, and their interpretation of events and phenomena; it can also supply a description and an analysis based on these perspectives (Johnson & Rasulova, 2016). The approach also emphasizes investigating and understanding the importance that people place on problems (Creswell, 2014). Its goal is to investigate the HoD’s instructional leadership role in selected primary schools in terms of increasing the use of technology-based education. This approach is also used because it is interpretive, rigorous, reflexive, and deep, and, also, because it is not based on a single truth or reality and because the 'phenomena' are dependent on our perspectives and understandings of them. The truth is produced by the interaction and relationship between the researcher and those involved in the research (Johnson & Rasulova, 2016; Mortari, 2015).

One of the reasons for using this technique is that it investigates and supplies deeper insights into real-world problems. Rather than gathering numerical data, as quantitative research does, qualitative research aids in the generation of hypotheses as well as the further investigation and understanding of quantitative data. Qualitative

research is a method for learning about people's experiences, feelings, and behaviours. Instead of asking how many or how much, it asks how and why (Brannan, Brannan, Sharts-Hopko & Tenny, 2021). Open-ended questions with non-numerical answers, such as how and why, are used in qualitative research. Qualitative research design, unlike quantitative research design, is not always linear due to the open-ended nature of the research questions (Brannan *et al.,* 2021).

The advantages of using this research method concerning this study are based on research conducted in a natural setting. It includes, but is not limited to, how teachers experience aspects of their profession, how they behave as individuals or in groups, how the schools operate, and how interactions shape their relationships. The researcher is also the primary data collector, and this allows him or her to investigate why events occur, what happens, and what those events mean to the participants in the study (Martimianakis, Stenfors-Hayes, Teherani, Varpio & Wadhwa, 2015).

4.5 STUDY POPULATION AND SAMPLE

4.5.1 Study Population

The study focused on all teachers and HoDs in public primary schools in the Johannesburg District of South Africa. The schools in this District represent the population on which this study concentrates.

4.5.2 Sampling Procedure

Sampling is understood as a process through which individuals are selected to take part in a study (Dudovskiy, 2018). The sampling techniques used within this process, however, need to be proper and should include participants who would best stand for, or have knowledge of, the research topic. Non-probability sampling methods are the primary method used in qualitative research studies rather than random sampling. Qualitative researchers who wish to collect data that fits the parameters of the research questions, goals, and purposes engage in purposive sampling where individuals, groups, and settings where the specific process being studied is most likely to occur are sampled (Tracy, 2013). Due to the research being based on a qualitative approach and looking to understand experiences within a broader context, the selection of participants for this study was done using the purposive sampling technique. Purposive

sampling assists in finding and selecting individuals or groups of individuals that are especially knowledgeable about or experienced with the phenomenon of interest (Creswell & Plano Clark, 2011). Therefore, this technique allowed the researcher to rely on this kind of judgement when choosing participants who would offer the most information-rich data.

The sampling process used in this study gathered data from a small group, instead of a large group, as not everyone, everywhere, can be studied at the same time. The sampling process falls in line with the qualitative approach being used in this study, as it is focused on a small group.

4.5.3 Study Sample

From the entire population, six primary schools within the district in the Gauteng province were purposefully selected for the study due to their geographical location, accessibility, and socio-economic classification. From each of the six samples schools, five participants, consisting of three teachers and two HoDs, were chosen as the sample (n=6x5=30). The areas in which these six schools are found have permanent residents, consisting of different ethnic groups of various socio-economic backgrounds. Such a sample with diverse backgrounds increases the external validity of the sample. A profile for each school was developed by the researcher in terms of the buildings, the number of staff, the classrooms, the number of learners, the learning facilitators, and the extra-mural activities; this developed a context that describes the site of the study. Based on the selection of participants, the research instruments used to collect data are presented in the next section.

4.6 DATA COLLECTION INSTRUMENTS

Data collection is an account of the data-gathering techniques planned for the study and of the instruments used. In a qualitative research approach, data can be collected by asking questions using open-ended and closed-ended questionnaires, document analysis, or first-hand observation (Creswell, 2014). The use of multiple data collection methods increases the credibility of evaluation findings when the information from various sources is combined to see whether they are consistent with the direction of the findings.

The method of data collection in this study was the use of questionnaires as it is easy to collect a large amount of data from groups and to generalise the findings. The questionnaires were used to collect biographical information from participants and to assess attitudes, opinions, and beliefs.

A questionnaire is a written or printed structured form that has a pre-formulated series of questions to collect data on a variety of topics. Questionnaires can be used through face-to-face conversations, through phone conversations, or through computer or mail contacts. A questionnaire is also inexpensive and it makes data collection rapid and inexpensive (Bell & Waters, 2014; O'Leary, 2014). The use of a questionnaire within a qualitative approach is helpful because the data collected is free-form and non-numerical, and it does not need coding because the goal is to understand a social or human problem from multiple perspectives. In a quantitative approach, the data collected is coded in numerical form in order to find problems, to evaluate a theory with numbers, and to analyse it with statistical techniques (Bell & Waters, 2014; O'Leary, 2014).

Questionnaires can be used for a variety of purposes, including deciding what people are thinking. Permission must be obtained before administering a questionnaire that has been constructed. Furthermore, the researcher must reflect on the questions and decide whether the method used to gather information is the best choice; before writing up the questionnaire, the researcher should explore other options for gathering the necessary data (Bell & Waters, 2014; O'Leary, 2014). Furthermore, questionnaires need planning to ensure that the data derived from the questionnaire is valid, relevant, and easily analysed. Questionnaires should, however, be clear, the questions should be unambiguous, and participants' errors should be minimized.

The study used a qualitative questionnaire to gather information about the participants' experiences with technology and the role of the HoD in this process; it considered the above factors in order to develop a better understanding of the demographics of each school. The questionnaire was valuable since it allowed us to analyse the perspectives of many people as quickly as possible. Allowing information to be collected through participants’ responses to the questions helped to clarify qualitative data. The inclusion of a questionnaire decreases the risk of researcher bias, while it also supplies an objective baseline for the study (Al Mofarreh, 2016).

The questionnaire was adaptable, with open-ended questions worded in such a way that participants could respond to yes or no questions, as well as respond more broadly to other questions. The questionnaire was also designed in such a way that participants would be free to express their opinions in response to the questions being asked without being influenced, and this allowed a more in-depth response. The questions were prepared as basic questions that requested participants to affirm or deny their responses verbally or in written form, and the questions were phrased in a language that all participants could understand (McMillan & Schumacher, 2010). The questionnaire was divided into two sections: Section A and Section B. (*cf.* Appendix G). Within these two sections, there were many categories: personal and academic details, ICT availability, professional development, and the use of ICT in the classroom and by teachers in their planning. Sections A and B of the questionnaire included self-anchored scaled questions, as well as open-ended questions that required participants to respond in the way they preferred or to respond directly to the questions.

The questionnaires were distributed to teachers and the HoD. A questionnaire, by definition, is an instrument that must be strictly standardized in terms of the text of the questions and their order. Non-objective answers raise doubts, so questions should be interpreted and asked of everyone. According to Da Silva (2017), the issues should be clear and without ambiguity, and all participants should know exactly what is expected. The target sample in the sampling procedure was 6 schools x 5 participants from each school = 30 participants in the Johannesburg South District. The purpose of the questionnaire was to investigate and document the participants' contributions to characterizing the HoD's instructional leadership role and its impact on the use of technology in a 21st century classroom.

The questionnaires were distributed and collected as follows: the questionnaires were packed according to the number of participants and delivered to the participants at the various schools by the researcher. A total of 93 percent of the participants returned completed questionnaires, with 7 percent completing only part of the questionnaires. The questionnaire was given to the participants for a week to complete. The questionnaires were then collected from the schools by the researcher.

4.7 THE PILOT STUDY

The questionnaire was piloted within the researcher's school environment, where it was distributed with a covering letter to all teachers, including members of the School Management Team (SMT), requesting a total of twenty pilot participants. The pilot study dealt with a small sample size (20 participants) and aided in reflecting on the diversity of the target group to confirm that the issues could be understood. They were given a week to complete the questionnaire; this was part of the testing process to decide the time needed for completion. They were also given the choice of where they wanted to put their completed questionnaire. This was followed by an analysis of the data to ensure that the questions were relevant, that the method used was effective, and that the necessary adjustments were made (Bell & Waters, 2014).

When the data from the pilot study were analysed, it was discovered that only nineteen of the twenty-five questionnaires distributed were returned, with six being no-returns. Following up on the no-returns was impossible because non-disclosure of identity was allowed. Some of the ambiguous questions were rephrased to supply more clarity, while others were eliminated because they were found to be irrelevant.

4.8 DATA ANALYSIS AND PRESENTATION

Analysis of qualitative data is defined by Creswell and Poth (2018) as the reduction of data into themes derived from codes. Coding divides the data into segments and gives each one a name. A code, according to Sadaña (2016) and Simons (2009), is a word or short phrase that allows for greater insight into the data. The method of choosing, categorizing, comparing, synthesising, and analysing data in this study was iterative, rigorous, and systematic (McMillan & Schumacher, 2010). It was a process of extracting broader and more specific themes from voluminous questionnaires and observation data that had been transcribed. This researcher gained a better understanding of the data by reading it several times (memorizing) to find more codes. The developed codes resulted in the development of themes related to the research questions. The data was analysed by using Figure 4.1:

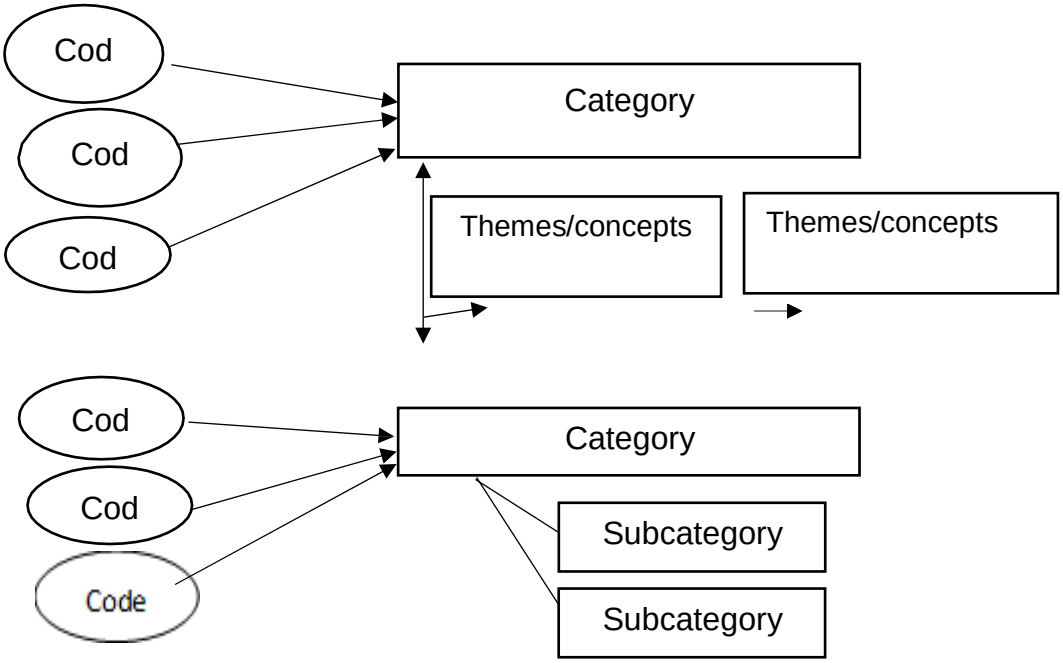

Figure 4.1: Qualitative data analysis (Saldaña, 2016:12)

According to Maree (2013) and Saldana (2016), data obtained can be coded to create patterns. The researcher read the questionnaire responses, transcribed them, and coded them in this study. A cluster of similar codes was organized to form categories and subcategories, which later revealed a pattern. Those patterns were organized into categories and subcategories, resulting in themes that supplied answers to the research questions.

The questionnaire consisted of open-ended questions. After collecting the data, it was read and analysed to get a sense of similar issues that might exist among participants. Similar responses were grouped, and the data was coded. According to Creswell (2012), reading, reading, and reading once more through the data compels the researcher to become familiar with the data in intimate ways. McMillan and Schumacher (2010) add that the researcher needs to search through the data for regularities, patterns, and topics and to write words and phrases that would become those topics and patterns. Accordingly, the researcher searched through the data for responses and patterns, as well as topics covered by the data, and then wrote words and phrases that became the topics and patterns.

The data was divided into manageable themes or categories, and these emergent patterns or categories were colour coded. The emphasis on emic categories in data collection can be used. (Emic categories are explanations of what the phenomenon means to the participants (McMillan & Schumacher, 2010).) The researcher focused on getting a holistic understanding when analysing data, by going through the transcripts to arrive at the same understanding as to the respondents' feelings,

opinions, and views. The presentation of the data appearing from the analysis is reported in Chapter 5 as quotes from participants.

4.9 THE TRUSTWORTHINESS OF THE STUDY

Trustworthiness in qualitative research is important as it binds the researcher to ensure that the findings of the research are trustworthy and may be interpreted and applied in the field and may benefit researchers and other interested parties (McMillan & Schumacher, 2010). To be recognised as being trustworthy and valued, the research needs to be conducted rigorously and methodically to produce meaningful and useful results (Nowell, Norris, White & Moules 2017). The trustworthiness of the research results must also be credible, dependable, transferable, and confirmable, to prove trustworthiness (Given, Winkler & Willson, 2014), and this will be discussed next.

4.9.1 Credibility

Bertram and Christiansen (2014) state that credibility is ensured when the participants and end-users in the research agree that the data collected is believable from their perspective. The study is credible in the sense that accuracy is found by finding participants directly involved in the issue being studied. According to Moon *et al.* (2016), credibility also refers to the 'truth value' of the research, that is the degree to which what researchers state is the actual meaning or intention of the research participants' views.

Shenton (2004:64) describes credibility as the truth value that deals with the question, *how congruent are the findings with reality*? This refers to how the social world that is being studied is represented and how it is assessed in terms of the process that is used, regarding the credibility of those representations for the community under scrutiny. McMillan and Schumacher (2010) also describe credibility as the process when the participants and the end-users within the research agree that the data collected is credible from their perspective. The study's credibility is also ensured when selected participants who are directly involved in the study consider it to be accurate. Because of the variety of methods used in the study, the researcher tried to use as many different means as possible to verify the results.

Participants were encouraged to be open and honest, and it was made clear that there were no correct or incorrect answers to the questions posed. Participants were also

encouraged to share their ideas without fear of losing their credibility. To elicit data, iterative questioning and probes were used. Furthermore, credibility was increased through member-checking, a process in which transcripts, data analysis, and findings were returned to participants to ensure that what they had answered was true and correct and to allow them to change anything they considered incorrect to assure the reader that the study was valid and dependable.

4.9.2 Transferability

Transferability refers to the extent to which the findings can be applied in other contexts or with other respondents (Babbie & Mouton, 2011). If the researcher supplies enough data through rich and sufficient description, a judgement could be achieved. The findings of the study are presented in such a way that they can be applied to other public primary schools experiencing the same challenges about the use of ICT by teachers within the school. The sites used in this study were schools within the southern suburb areas resourcedwith ICTs for teaching and learning. The researcher was unable to research all the schools; therefore, a sample representative of the schools was purposively selected because the ICT context of the schools used was similar.

4.9.3 Dependability

Dependability is a technique for proving the consistency of the findings. Based on this, the researcher tries to examine the data, findings, interpretations, and recommendations to decide whether the study is data-supported and trustworthy. External audits are also performed by the researcher, who assesses the accuracy of the data and whether the interpretations and conclusions are supported by the data. The researcher must also prove dependability through an audit trail and through different ways that are relevant. The researcher presents the study's findings and recommendations to participants, who must examine and supply feedback to confirm whether the findings and recommendations are based on the collected data or not. Furthermore, participant feedback was incorporated, and observation data was supplied: this was a natural approach to checking the data, controlling biases, and setting up a valid proposition to the study. The study's dependability was also set up by the consistency of the research findings, should the study be repeated with the same participants in the same environment (Krefting, 1991). This is supported by Bitsch (2005:250–260) saying that dependability is the stability of findings over time.

4.9.4 Confirmability

According to Moon and Blackman (2014), confirmability requires the researcher to prove that the results are linked to the conclusion in such a way that they can be followed and replicated. According to Anney (2015), confirmability is the degree to which the findings of an investigation can be confirmed or validated by other researchers. Tobin and Begley (2004) go on to say that confirmability is concerned with proving that the data and interpretations of the findings are not figments of the inquirer's imagination, but that they are derived from the data gathered. The researcher used questionnaire transcripts to prove the study's confirmability and provided these transcripts for others to read so that they might review the research results.

The findings of this study are also confirmed by the literature outlined in Chapters two and three, which can be used to support or refute the findings derived from data on the experiences and perspectives of the teachers and the HoDs who took part in the study and not to rely merely on the researcher's preferences.

The researcher followed specific moral rules that were crucial for checking the behaviour between the research participants and the researcher, as credibility is the cornerstone of the research. In the concluding section of this chapter, the ethical problems related to this investigation are examined.

4.10 ETHICAL CONSIDERATIONS

According to Neuman (2011), ethics begins and ends with the researcher's moral and professional commitment to be ethical, even if research participants are unaware of or uninterested in ethics. Ethical considerations are relevant in both quantitative and qualitative research, but qualitative research is more significant because it intrudes into the lives of participants (Khan SN, 2014).

Ethical clearance was looked for from the UNISA Ethics Committee before data was collected, because any study must have ethical clearance before it can begin. This procedure ensures that sound method and scientific validity are followed, as performing research with defects is a waste of time, money, and resources. It is recommended that students apply for ethical approval after completing the literature review and finishing the research plan. At this point, the student should think about the procedure for obtaining consent to perform the research, as well as the design of the

instrument that will be used. The Unisa Ethics Committee reviewed and approved these documents, and permission was granted (*cf.* Appendix A).

According to De Castro and Banega (2015), ethical consideration also includes ethical issues, such as negotiating a relationship with and among participants in any study. A letter explaining the study's intentions and purpose was sent to the Department of Basic Education (DBE) requesting permission to research within these schools (cf. Appendix B) and, once consent was granted (cf. Appendix C), a letter was sent to the participating schools (cf. Appendix D) requesting permission for the study. This letter outlined the study's intentions and stated that it would be conducted in Gauteng public primary schools.

The code of ethics is being developed to create a role that encourages cooperation and openness and fosters positive relationships between participants and the researcher (McMillan & Schumacher, 2010). The relationship should encourage participants to be truthful when giving information, so a letter outlining the purpose of the research was sent to participants, along with an invitation to take part in the study. Participants who signed their agreement to take part in the research were given a consent or reply form. To collect data for this study, the researcher distributed a questionnaire, which participants had to complete concerning the research question. Participants did not have to record their names on the questionnaires. According to McMillan and Schumacher (2010), ensuring confidentiality entails protecting participants' anonymity or privacy by concealing their identities and not using their names (Creswell, 2012, McMillan & Schumacher, 2010).

4.11 CONTRIBUTION OF THE STUDY

The importance of the research under consideration is that the findings could be used to enhance the body of existing knowledge on the management and usage of ICT in primary schools. Furthermore, the HoDs as instructional leaders should be able to accomplish their duties more effectively and meticulously by utilising ICT to a larger extent. Teachers should also be prepared to grasp how to use ICT in the classroom, and this could lead to a reduction in their teaching time. Teachers that are empowered will pass on their expertise and knowledge of technology to their students.

The purpose of this study was to determine the usefulness of using ICT in a 21st-century classroom, as well as the function of the HoD within this process. The data gathered served as the foundation for the analysis used to answer the objectives of

the research. The data also allowed for qualitative data analysis in addressing the research topic: **The Instructional Leadership of the Head of Department in South African primary school classrooms in enhancing the use of technology-based education.** This chapter covered the specifics of each qualitative data collection method, as well as the details of each approach.

4.12 CONCLUSION

The fourth chapter had both a summary of the research's purpose and a detailed explanation of the method. The sample, as well as a description of the data collection technique, was provided with both the pilot and main studies. The next step in content data analysis was discussed. In the final sections, there was a discussion of the study's trustworthiness, as well as the ethical considerations ensured in this investigation. The data presentation and data analysis of the study are reported in Chapter 5.

CHAPTER 5

PRESENTATION AND ANALYSIS OF DATA

5.1 INTRODUCTION

This chapter focuses on the presentation and analysis of the collected data. The study aimed to examine the educational leadership role of HoDs in South African primary schools. In this study, a case study research design and qualitative research approach were used to gain a deep understanding of the HoD phenomenon in their teaching leadership. Therefore, an open questionnaire was used to collect data to answer the research question with its relevant sub-questions, namely: **What is the instructional leadership role of the HoD in South African primary school classrooms in enhancing the use of technology-based education?**

To answer the research question, the chapter is divided into four parts. The first part deals with the coding and profiles of the research participants and schools. The second part deals with the presentation of data, analysis and discussion of the teachers' responses to the questionnaire. The third part presents the data, analysis and discussion of the answers of the HoD to the questionnaire. The fourth part provides a summary of the chapter.

In the presentation, analysis and discussion part, the voices of the participants are presented with verbatim quotes. Since the main aim of the study is to determine the instructional leadership role of the HoD in South African primary schools to obtain adequate information for the research questions, the voice of all study participants is included.

The research instrument used to collect data, the open-ended questionnaire was used to find answers to the research question and its sub-questions. Therefore, the data presentation and analysis emphasise the sub-research questions:

- What is the concept of the 21st century classroom?
- How can the HoD contribute to the effectiveness and improve the use of technology in the 21st century classroom?

- What is the role of the HoD in designing, implementing, and maintaining an effective technology model for the 21st century classroom?
- Which instructional leadership skills does the HoD, as an instructional leader, need to effectively lead teams and teachers?
- What strategy model could be implemented by the HoD to enhance the use of technology within the 21st century classroom?

5.2 BIOGRAPHICAL DATA OF PARTICIPANTS AND SCHOOLS

5.2.1 Coding of Participants

In this study, great attention was paid to ethical considerations. Therefore, the study participants received codes to keep the confidentiality of the collected data and protect the privacy of the participants. For ethical reasons and the agreement with the participants not to call them by name or give any sign of their identity, coding was used and study results are reported in aggregate form. Therefore, the coding and characteristics of the school and study participants are presented in this section.

The schools studied are of various levels and the level of education, qualification experience and managerial positions of the study participants differ. The following codes have been used and are represented as follows:

Table 5.1: Summary of codes of schools and study participants

Schools	School code	Teachers and codes	School code	Heads of Department and codes
School A	SA	T1-4	SA	HoD A 1
School B	SB	T1-4	SB	HoD B 2
School C	SC	T 1-4	SC	HoD C 3
School D	SD	T1-4	SD	HoD D 4
School E	SE	T1-4	SE	HoD E 5
School F	SF	T1-4	SF	HoD F 6

Based on the above table, Teacher 1 of School A is referred to as SA T1, Teacher 1 of School B as SB T1, Teacher 1 of School C as SC T1, Heads of Department are referred to as HoD 1 of school A as HoD A1 and so on.

5.2.2 Background of Sampled Schools

The schools are all managed by the Gauteng Department of Education (GDE) and function as Section 21 Schools. The South African School's Act 84 of 1996, created two categories of public schools: Section 20 and Section 21 schools (The South African School's Act, RSA,1996 official government act). Section 20 of the Act includesa range of functions that must be undertaken by School Governing Bodies (SGB). Section 21 lists further functions that could be added to schools if they have shown they can perform those functions effectively. The understanding of the term 'Section 21 Schools' can be regarded as synonymous with the concept of self-managing and of being self-reliant - in other words, schools that can do what is needed correctly andas needed. This would also imply that there is less control by the GDE coupled with less bureaucratic involvement. The schools in the research, being Section 21 schools, implies that they can buy their own Learner Teacher Support Material (LTSM) as needed rather than being provided with textbooks and resources they may not need (Draper, 2010).

The schools in the study are well kept, with tidy grounds, a fence around the school and a security guard controlling access in and out of schools. The school gardens are well kept, corridors are clean and the cloakrooms and other facilities are well kept. The teachers at these schools were supported concerning access to textbooks, learner workbooks, photocopy equipment and other resources to help them in the teaching and learning process. The schools all have a media centre, with many having received books donated from private companies. In some of these media centres, space was made to add a few computers that could be used by both teachers and learners. In South African schools, technology is included in the curriculum as a subject in primary as well as secondary school years (Grades R-9) and the upper secondary school years (Grades 10-12). The curricula are presented in the Revised National Curriculum Statements (RNCS) as 'Technology' (DoE, 2002b), for Grades

R to nine and as ‘Computer Applications Technology (CAT) (DoE, 2003) for Grades 10 to 12 and are examinable subjects.

As reported in Chapter 4 (4.5.3), six primary schools in the southern district of Johannesburg were specifically selected for inclusion in the study sample. The South District of Johannesburg is a municipality, so all selected primary schools were in urban areas. Schools are labelled as follows: School A, School B, School C, School D, School, E, School F. Each school is described below.

5.2.2.1 School A

The school is conveniently and centrally found in the Southern Suburbs of Johannesburg. The school was built 61 years ago and can accommodate 760 learners. The school has twenty classrooms, two mobile classes, a multi-media centre, a school hall and a computer lab, as well as an Early Childhood Centre (ECD). The language of learning and teaching at the school is English home language, with Afrikaans as the first additional language. The school is multi-racial and has a junior class of toddlers from three to five years old, a middle class of learners from four to five-year-olds and three-grade R classes for learners from five to six years. With staff having years of experience heading the education of these learners, the primary focus is the preparation of all learners for primary school with learners in the Foundation Phase achieving excellent results.

5.2.2.2 School B

In 1992, many children were turned away from a neighbouring school due to a lack of space. The parents formed the Parent Action Group to lobby for the building of a new school, School B, in the area. In 1993, the first Grade 1 class was created and housed at a nearby primary school. In May 1993, building started on the Junior Primary and Administration building. In 1994, the school opened for the Junior Primary Phase with eighty-one learners. The buildings were finally completed in August 1994. In 1995, the school was opened to all grades. By the turn of the century, all classrooms were built and occupied by seven hundred learners and thereafter, the Grade R premises were built consisting of three classrooms. The Grade 3 classrooms were erected in 2001. Since its beginning, there have been many upgrades and refurbishing done to the

school with interactive whiteboards, data projectors and a laptop for each classroom as some of the modern technology resources being installed in every classroom. Today the learner enrolment is close to 1 060 learners, with a staff complement of fifty-two.

5.2.2.3 School C

School C is a public primary school with twenty-four teachers and 578 learners. The school is situated in the South of Johannesburg and is classified as an urban education institution by the Gauteng Department of Education and specialises in ordinary education. The school is a dual-medium school with English and Afrikaans as the language of teaching and learning. It is a fee-paying school with the School Governing Body (SGB) being given added powers according to Section 21 of the South African Schools Act.

5.2.2.4 School D

School D has a history dating back to 1945. The area was the suburb where injured soldiers from the Second World War were sent for rehabilitation. The school, at that stage, was a dual medium, with English and Afrikaans being the languages of teaching and learning. Classrooms were prefabricated huts with coal burners to keep the children warm in winter. Learners handwrote using pen and ink made from powder and water. In 1954, the school became an English-medium school, and the name was changed as the school was being confused with one of the neighbouring schools.

In 1991, the school opened its doors to all learners and teachers of colour. Due to community growth, the number of learners within the school also increased from twenty-five to currently forty-five learners per class. The school also became an English-medium only school. Currently, the school caters to learners from Grade R to Grade 7. The Foundation Phase consists of Grades R, 1,2 and three. The Intermediate Phase consists of Grades 4,5 and 6. Grade 7 falls within the Senior Phase. The school also has an LSEN (Learners with Special Educational Needs), class especially for those learners who are unable to cope with the demands of the

mainstream academic programme. At the age of twelve, these learners are transferred to a Technical Special High School, where they are taught a trade, such as carpentry, mechanical, hairdressing, dressmaking and cooking.

5.2.2.5 School E

School E is a public primary school found in the Southern Suburbs close to a busy road. It is a Section 21 school and classified under quintile five. In 2016, the school had 738 learners with twenty-two teachers. The school was built before the country achieved its independence and is found close to the city and within walking distance of the shopping complex. It was a former model C school meant for white children before the country's democratic elections in 1994. The school is one of the oldest and is found next to one of the high schools in the area. The school is surrounded byan electric security fence with a guard checking the entry and excess of visitors.

5.2.2.6 School F

School F is a public primary school found in an urban suburb. Before 1994, the school was meant for students from the Asian community only but today serves African children as well. The school is situated in a suburb within proximity to an informal settlement and next to a busy road. The school is within a short driving distance of the hospital and shopping complex. In 2016, there were 992 registered learners, including 30 Grade R learners and twenty-six teachers. It is a section 21 school, classified under quintile five. It was found that some parents made a living from selling vegetables and other foodstuffs in the area.

5.2.3 Background Information of Participants

The study collected background information on the thirty participants through a questionnaire in which they were asked to supply their personal information, such as gender, academic and professional qualifications, and their many years of professional experience. These characteristics were important to this research because the researchers believed that this information could help to understand the academic and professional qualifications of the participants.

5.2.3.1 School Heads of Department

Six HoDs participated in the research. Of these HoDs a is newly promoted incumbent who has less than two years of experience. The other five were experienced HoDs with more than two years of experience, as shown in Table 5.2. (*cf*. Appendix G, Section A).

Table 5.2: Characteristics of HoDs

School	Participants	Codes	Gender	Qualification	Responsibility in school	Years of experience
School A (SA)	Head of Department A1	HoD A	Female	BA (+PGCE)	HoD (FP)	1
School B (SB)	Head of Department B2	HoD B	Female	BEd	HoD (FP)	2
School C (SC)	Head of Department C3	HoD C	Male	BEd	HoD (IP)	7
School D (SD)	Head of Department D4	HoD D	Female	BEd	HoD (SP)	6
School E (SE)	Head of Department E6	HoD E	Female	BEd (Hon)	HoD (SP)	10
School F (SF)	Head of Department F7	HoD F	Female	BEd (Hon)	HoD (FP)	4

5.2.3.2 Teachers

A total of twenty-four teachers took part in the research. Four teachers were purposively selected from each of the six schools. Each group was made up of five participants, with both male and female participants. The teachers were representatives from all the schools selected. The purposive of this mixture was to allow teachers to feel comfortable and answer the questionnaire as honestly as they could.

Table 5.3: Characteristics of teachers

School	Participants	Codes	Gender	Qualification	Responsibility in school
School A (SA)	Teacher A1	TA1	Female	Diploma (4years)	Class teacher (FP)
	Teacher A2	TA2	Female	Diploma (4years)	Class teacher (IP)
	Teacher A3	TA3	Male	BA (+PGCE)	Class teacher (SP)
	Teacher A4	TA4	Female	BEd	Class teacher (IP)
School B (SB)	Teacher B1	TB1	Female	BEd	Class teacher (FP)
	Teacher B2	TB2	Female	BA (4 years +PGCE)	Class teacher (IP)
	Teacher B3	TB3	Female	BEd	Senior teacher (SP)
	Teacher B4	TB4	Female	BEd (Hon)	Class teacher (SP)
School C (SC)	Teacher C1	TC1	Male	BEd	Class teacher (IP)
	Teacher C2	TC2	Male	BEd	Class teacher (IP)
	Teacher C3	TC3	Female	BEd	Class teacher (SP)
	Teacher C4	TC4	Female	BEd	Senior teacher (FP)
School D (SD)	Teacher D1	TD1	Female	BEd	Class teacher (FP)
	Teacher D2	TD2	Female	BEd	Senior teacher (IP)
	Teacher D3	TD3	Female	BEd	Class teacher (SP)
	Teacher D4	TD4	Male	BEd	Class teacher (IP)
School E (SE)	Teacher E1	TE1	Male	BEd	Class teacher (IP)
	Teacher E2	TE2	Male	BEd	Class teacher (IP)
	Teacher E3	TE3	Female	BEd	Class teacher (SP)
	Teacher E4	TE4	Female	BEd	Class teacher (SP)
School F (SF)	Teacher F1	TF1	Female	BEd	Class teacher (SP)
	Teacher F2	TF2	Female	BEd	Class teacher (FP)
	Teacher F3	TF3	Male	BEd	Class teacher (IP)
	Teacher F4	TF4	Female	BEd (Hon)	Class teacher (IP)

The information set out in Table 5.3 shows the relevant information on the teacher participants; the focus can now shift to a presentation of the findings.

5.3 DATA PRESENTATION AND DISCUSSION

A solid foundation has been laid to interpret the results through the qualitative report and includes detail to contextualise the study setting. The data collected from the participants who responded to the questionnaire were summarised according to the research sub-questions, which are discussed as categories each with their own themes that emerged during the analysis and supported by the literature, as discussed in Chapters 2 and 3.

5.3.1 Discussion and interpretation of responses from teachers and HoDs

5.3.1.1 Research sub-questions 1: What is the concept of 21st century classroom?

Key challenges of information access, information overload and information quality faced by teachers are addressed by ICT literacy. Under this theme, is a discussion of teachers' understanding of the 21st century classroom and the functionality of ICT within the 21st century classroom.

a) Theme 1: Understanding of the 21st century classroom

The 21st century classroom is focused on the students experiencing the teaching and learning process while developing their higher-order thinking skills, learning how to communicate more effectively, developing collaboration skills while adapting them with using technology. Technology has become an important part of the modern classroom. Teachers need to recognise and understand the usefulness of diverse types of technology within their classrooms. The days of teachers standing in front of the classroom has been replaced with students working on computers and teachers using interactive whiteboards when presenting lessons.

ICT is vital in building an information society and knowledge economy as well as fostering innovation and competitiveness (Department: Telecommunications and Postal Services, 2016). In an era characterised by massive technology changes, teachers need to be equipped with knowledge and skills appropriate for the 21st century as well as digital literacy (UNESCO, 2016). According to UNESCO (2016) to be effective as a citizen, one needs to be competent in using ICT as collaboration and

creative problem-solving is needed. In the questionnaires, participants were asked about their understanding of ICT.

b) Theme 2: The functionality of ICT within this classroom

The understanding and functionality of the use of computers are intricately linked to communication. Learning in schools that use ICT will be enhanced as ICT adds a new dimension to the learning process as well as improving the working relationship within the school amongst the teachers and management. ICT has become an important source of innovation and improvement of efficiency and ICT application has become an important part of the teaching and learning process both inside and outside the classroom. According to Poushter (2016), the use of computers, mobile devices and the internet is at its highest level to date and is expected to continue to increase as technology becomes more accessible, especially for developing countries.

(i) Analysis of teacher data

TB1: *"21st century classrooms are student-centred, where teachers are seen as facilitators of learning"*

TA1: *"ICT will make teaching my learners easy and the classroom environment will be more productive".*

TF1: "*Using computers in the classroom will reduce the amount of writing books learners will be using as well as the marking of it will be less. It will also reduce paperwork for me as a teacher as I would be using the computer to prepare my lessons as well as present it to the learners, making it more interesting for them."*

TA2: *"Learners would be more interesting in the lesson as it will not be as boring as it used to be."*

TA3: *"ICT can help me plan better and develop more interesting worksheets; I will also be able to use different teaching techniques."*

TA4: *"Training is very important if you don't know what to do it can cause serious problems".*

The responses show that the participants understand the concept of 21st century classrooms and recognise the benefits of the use of ICT in the teaching and learning process; it does suggest that some attempts have been made to interact with technology and learn from its use. The response also suggests that the participants recognise the importance and benefits of training concerning the use of ICT and are willing to learn to improve their technical knowledge.

Understanding the functionality and use of ICT within schools is important for its implementation to be successful. Teachers need to become familiar with the use and workings of a computer. ICT can empower teachers to engage in the learning process, learn more, collaborate with others, and explore the world around them. ICT can also give teachers opportunities to transform the learning process by using a range of tools to present and display their teaching. In understanding how computers work, teachers are able to manipulate data to help develop an understanding of the subject matter, share resources, abilities, and advice. ICT would also aid teachers to prepare and design lessons and thereby enhance their professional image.

(ii) Analysis of Heads of Department data

School D (HoD D1): "*21st century classrooms will change the traditional relationship between teacher and student to one that is more collaborative one*".

School E (HoD E2): *"21st century classroom are classrooms which will be intellectually safe, comfortable places encouraging peer interaction and connections with the learning materials students are studying because their experiences will inspire creative solutions and communication skills."*

School F (HoD F1): *"my understanding is that 21st century learning is about teaching students certain core values such as critical thinking, problem-solving and digital literacy to help them keep abreast with recent changes they will experience in the evolving world."*

School A (HoD A1): *"To enhance teaching and learning and communicate with others and share ideas. It is learning about the computer and the use of it by everyone at the school. ICT can make things easier if we know how to use it, as well as reduce the time we would spend on planning and preparation of work."*

School B (HoD B2)*: "ICT will allow us to work remotely and still be effective in communicating with teachers and facilitators from the district, as well as submitting documentation on time."*

School C (**HoD C3):** *"The process of becoming familiar with the use of ICT was slow but the benefits of it are beginning to show and as a result, it has become difficult to work without technology*."

The HoDs' responses suggest that they understand the concept of 21st century classrooms and the changes it brings to the teaching and learning process. The old traditional classrooms are thus replaced with an open and collaborative way of educating students.

The responses offered by the Heads of Department have some familiarity with the use and benefits of ICT, but more understanding is needed that ICT is not only about computers or about the use of computers but can help the teaching and learning process. The response also shows that HoDs recognise that ICT can create new ways of communication that can allow them to set up links with institutions such as the Department, other schools as well as universities. HoDs can also use ICT to create communication groups such as "WhatsApp" amongst the teachers to share information and let them know of changes that might be taking place within the school. Other social media platforms can also be used such as Facebook, Twitter in creating a portfolio of the school as well as creating a school webpage/site to communicate with parents by publishing newsletters about the school. Parents are also able to communicate with the schools through this process. The HoDs acknowledge that ICT has become an integral part of daily life and one would be lost without it.

5.3.1.2 Research sub-question 2: How can the HoD contribute to the effectiveness and improve the use of technology in the 21st century classroom?

a) Theme 1: Provisioning of ICT equipment in schools

The implementation of ICT is dependent on the placing of resources within the school. For the schools to be fully functional, it would require the necessary hardware and software. According to Ojo and Adu (2018), ICT includes but is not limited to electronic

machines or devices used to help the teacher achieve set goals and aims in teaching and learning. These researchers continue by saying that ICT is a tool that can be used to change learning behaviour.

The use of ICT within schools has become vitally important in bringing about improvement in teaching and learning. Teachers become inspired and motivated when laptops are supplied to schools. Some educators indicated that when there were no resources such as laptops and there was limited access to Wi-Fi, and access to the internet, they were not able to access the required academic materials that can be used in teaching and learning.

b) Theme 2: The provision of ICT training within the school

A major concern was the shortage of equipment, as shown by the participants' responses. The use of ICT as a pedagogical tool has been reported in studies according to Kihoza, Zlotnikova, Bada & Kalegele (2016). The pedagogical use of ICT includes amongst others, communication for sharing, investigating, capturing of data, analysing and assessing, managing tasks, assessing multimedia and standing for meanings (Grimus, Ebner & Ally, 2016; Cheung & Hew, 2009). According to Kong *et al.* (2014), learning can be connected to the world through mobile learning, which can allow people around the world to learn from any location as well as accommodate diverse types of learning styles whilst supporting inquiry learning by making a range of resources available.

Furthermore, the 21st century is characterised by fast changes in technology tools, ample information and profuse collaboration capabilities, hence the importance of digital literacy (Bishop, 2016; Voogt, Erstad, Dede & Mishra, 2013). It is therefore important that the learning environment is fitted out to equip teachers with diverse types of digital literacy. The learning environment includes the physical location, contexts and culture of the school and classroom. What is more, a poor learning environment can contribute to teachers feeling unappreciated, demoralised and demotivated. Bishop (2016) and Voogt *et al.* (2013) similarly add that setting up a

suitable environment, human support and learning practices are needed to support 21st century learning skills outcomes.

(i) Analysis of teacher data

The feedback from teachers about the provision of ICT within schools concerns the issue of effectiveness, cost, equity and sustainability.

TD2: *"HoDs can be more effective in helping teachers learn how to use not just computers but different programmes such as SASAMS that teachers need to use when capturing their students' marks."*

TB1: *"Lack of resources, lack of access could be reduced and eradicated if sufficient resources could be supplied."*

TB2: *"Teachers also mentioned that assistance from various stakeholders is needed to supply schools with computers and training for teachers'"*

TB3*: "Schools need new computers and not second-hand ones".*

TC1: *"The school buildings also add to the schools being unable to implement ICT as there is not enough space on the premises or in the classroom to set up computers."*

The inaccessibility of ICT resources is not always the result of the non-availability of hardware and software within the school. Factors such as the poor organisation of resources, inferior quality hardware, inappropriate software or lack of personal access for teachers, can also add to the inaccessibility of ICT. Teachers also added that the computer programs are either outdated or too advanced for them and that they had not received training on how to use them. By having the necessary ICT equipment, teachers can build up a bank of resources for both teaching and lesson planning, thus making future planning and curriculum delivery less demanding. Limited available space adds to the schools being unable to set up computer rooms, network servers as well as trunks for cables. Added to this is the lack of space in classrooms as it severely constrains effective use of ICT by teachers; school management must therefore become creative in creating space and allowing ICT to be implemented within the school.

(ii) Analysis of Heads of Department data

Responses from HoDs indicate the challenges they face with regards to the provision and use of ICT.

School B (HoD B2): "*Lack of software and internet connection is a problem that made the use of ICT more difficult as it was unreliable".*

School C (HoD C3)*: "Poor organisation of resources, inferior quality hardware, inappropriate software, and lack of personal access adds to the challenges they face".*

School D (HoD D4)*: "The issue of insufficient training with regards to the skills needed to use the ICT in the teaching and learning process also presented a problem".*

The lack of ICT resources has become a hindrance preventing Heads of Department from supporting teachers in implementing it within the teaching and learning process. Adequate facilities and resources need to be supplied for the effective implementation of ICT. All stakeholders such as parents, teachers, and students need to become involved in this process. By providing HoDs with the necessary ICT equipment, they can build up resources for future lesson planning and teaching. It will also allow them to keep all their information in one place, thereby affording them better time management and being more organised. Apart from receiving the correct and up-to-date equipment, adequate training is also needed that would provide them with the skills and knowledge they need.

5.3.1.3 Research sub-question 3: What is the role of the HoD in designing, implementing, and maintaining an effective technology model for the 21st century classroom?

a) Theme 1: Integration of ICT in learning

According to Krauss and Nkula (2014), the integration of ICT within the school does not just refer to placing computers in the classroom or using technology to support traditional teaching methods. It implies that technology is used to aid teaching and learning, allowing everyone involved to learn alongside or through it. Krauss and Nkula (2014) also say that integration can be described in two ways, firstly

associating with ICT adoption, and secondly with ICT use. They continue by outlining two further types of ICT use, namely, learning about computers and learning with or through computers. The integration of ICT in education plays a significant role in helping and enhancing student learning (Aslan & Zhu, 2018).

ICT can be a powerful tool for promoting educational opportunities, as a transforming process within education (Bindu, 2016). The use of ICT can bring rich material to the classroom and thereby provide a break with regular traditional teaching and learning and supply variety to the teaching approach.

b) Theme 2: The integration of ICT within the teaching and learning environment

Ghavifekr and Rosdy (2015) state that the integration of ICT within schools will help teachers in the global requirements replacing the traditional teaching methods with technology-based teaching and learning tools and facilities. ICT can also enrich the learning process by assimilating technological means into the learning practice.

Schindler, Burkholder, Osama, Morad & Marsh (2017) argue that there are many barriers to integration that arise because of tensions between policy and practice. It could be that some teachers might be reluctant to use technology due to a lack of technical knowledge or the efficacy of it to improve learning. Likewise, Francis (2017) adds that the reluctance of teachers could be that they are not motivated to try. What is more, Francis adds that as technology becomes increasingly integrated with daily life, teachers must take a more modern view on the use of technology to support learning. By integrating technology, teachers might find that it will open many opportunities that would otherwise not be accessible. Responses from participants showed the challenges that many teachers face in integrating ICT within their teaching and learning.

(i) Analysis of teacher data

Responses from teachers indicated that they are both positive and negative when it came to the integration of ICT into the teaching and learning process.

TC1: *"Time constraints, limited knowledge of computers makes the integration of ICT at times difficult, coupled with the fact that resources are not always readily and steadily available is also a concern".*

TB2: *"ICT cannot be used effectively to teach all topics making it extremely difficult to teach abstract topics using ICT. There are some things you cannot use ICT, especially when teaching a theory, it also depends on the content."*

TC2: *"It is good because you will be empowered to get more information and helps you to understand better and easy"*

TB3: *"ICT allows me to complete more work in less time*."

TD2: "*After delivering my lesson I go back, tweak it a bit with more resources I get online and then I use it again."*

On the positive side, some teachers reported that the integration of ICT allows them to complete lesson planning and deliver the curriculum far faster and efficiently and that those who integrate computers within their teaching, tend to be self-empowered. Teachers who use technology can plan a curriculum that would suit the needs of the learners, as well as allowing them to approach learning in their way and in time. Through a technology-centred curriculum, teachers can use technology to differentiate and accommodate classroom environments allowing learners to learn more. The process of integration can allow teachers to broaden the range of resources they can use. They can use resources when they are preparing their lessons as well as after delivering them. ICT can allow the teacher to move from teacher-centred learning to a student-centred learning process thereby increasing interaction and communication. It will also allow the teacher better classroom management and control as learners may become more focused on the lesson and less disruptive.

Those teachers who were not as positive, are within their rights to feel apprehensive about using ICT. The challenges they mentioned are real and these make the use of ICT at times difficult. Many of them also fall within the timeframe of not having had access to computers in their teacher training and can be referred to as those born before the age of computers. The task to get those teachers to become interested in learning about computers and developing their skills and knowledge, therefore, falls to

the Heads of Department, who must become creative and supporting and find ways to address the fear in the teachers.

By learning how to integrate ICT within their planning and curriculum delivery, teachers need to learn how to read a program, develop experience in using educational software and develop a working knowledge of computer terminology.

(ii) Analysis of Heads of Department data

Responses from the Heads of Department are also both negative and positive to the integration of ICT within the teaching and learning process.

School B (HoD B 2): *"It can be time-consuming as there is a lot of resources that one needs to go through in getting what you need."*

School C (HoD C 3): *"The technical issues, internet not always up and running. Cost factors, affordability and hardware needed. Integrating computers with your teaching and learning will allow you to understand your subject matter better"*

School D (HoD D 4): *"We don't have the equipment at school to allow us to integrate it within our subjects, but by using my personal computer and software I can use ICT when I do my planning and delivering the curriculum."*

School A (HoD A 1): *"By using ICT, 'dead' subjects like history can be brought to life making it more interesting and appealing."*

School E (HoD E 5): *"By using ICT, I can make use of concrete, real-world examples in delivering the curriculum*."

On the positive side, some felt confident about integrating ICT within their teaching process. HoDs have found that integrating technology with the various subjects makes planning lessons, assessments and recording of learner progress easy and it reduces time spent on it. By using a variety of ICTs in both the planning and delivery of lessons not only helps easier delivery of the curriculum, but it also becomes more beneficial and brings subjects to life.

HoDs mentioned that some schools did not have the ICT equipment and facilities but could form alliances with neighbouring schools to share their equipment and the cost

related to it. HoDs could also approach various companies to visit their schools and donate or supply items that schools could use.

One needs to remember that the integration of ICT is not without its challenges. Issues such as teacher confidence, lack of competence, lack of effective training, resistance to change, negative attitudes, lack of technical support as well as poor infrastructure contribute to it being a complex process.

c) Theme 3: Training on integration and implementation of ICT

According to the National Planning Commission (2012), ICT is vital in building an information society and a knowledge economy to foster innovation and competitiveness. In an era characterised by massive technological changes within the economy, both teachers and learners need to be equipped with knowledge and skills proper for the 21st century (UNESCO, 2016). The most cited barriers to the integration of ICT are the lack of professional development of teachers or teachers' training (Krauss & Nkula, 2014). Teachers also need access to diverse types of training where technology and pedagogical needs can be addressed. Teachers will not be able to integrate technology without the skills and knowledge of ICT (Krauss & Nkula, 2014).

Another barrier is the intrinsic nature of teachers which is rooted in their beliefs of teaching and learning. These beliefs are associated with how teachers see and do things as well as the changes in pedagogy, personal preferences, teachers' attitudes as well as their philosophy about teaching and learning. Overcoming this barrier is more challenging as it is more tacit and personal (Krauss & Nkula, 2014).

The use of technology will allow one to succeed in all sectors of life (Grimus *et al.,* 2014). Partners for 21st century learning state that information, media and ICT literacy are important in today's digital, globally interconnected, technology and media-driven environment. In the 21st century, literacy is perceived differently as it is also viewed in terms of technology and media literacy (Bishop, 2016). The importance of digital literacy within the 21st century can be characterised by the rapid changes in technology tools, abundant information, and profuse collaboration capabilities (Bishop, 2016;

Voogt *et al.,* 2013). In terms of participation, ICT is indispensable within a modern, globalised world (DHET, 2017).

(i) Analysis of teacher data

TE1: *"ICT skills and competence are crucial factors in the success and sustainability of integrating the use of web-based technology resources within teaching and learning"*

TE2: *"Teachers need training on how to incorporate digital content and technology for specific subjects"*

TE3: *"Different subjects and different grades should receive training on different days"*

TE4*:* *"The timing of the training should also be appropriate and should be subject and grade-specific, as well as first-hand practical sessions is needed"*

TF1: *"Training should not just be off-site, away from our school, as this makes it difficult for us to implement what we have learned."*

The responses show that teachers are concerned about the lack of support and knowledge on how to use ICT in daily teaching activities, which can result in teachers reverting to traditional teaching methods, despite the benefits offered by modern technology. Using ICT within the teaching and learning process requires the development of a new set of skills, attitudes and pedagogical approaches that would require training. For ICT equipment to have any meaning within the school, teachers need to become familiar with using it to implement the integration of ICT. Well-organised training will allow teachers to learn how to integrate many types of ICT such as PowerPoint and videos thereby making the lessons more interesting. Adequate training will also help teachers to prepare and plan for the technical issues they will experience while using ICT. The pressure that teachers at times have in finishing the curriculum and submission of planning and lessons could contribute to teachers making more use of ICT.

The use of a school-based model is also needed to supply training as this could help teachers master the concepts, knowledge and skills of using ICT in teaching and learning. Supplying training at their schools and making it practical and first-hand will

ease the teacher's fears about training on the use of ICT within the teaching and learning process. Showing teachers that learning about computers and being able to use them with their planning and delivering of the curriculum is possible and can be effective in their performance.

(ii) Analysis of Heads of Department data

School E (HoD E 5): *"A user analysis should be done where there should be separate training depending on teachers' computer skills and ability. Training is important as the lack of it will influence the acceptance and adoption of ICT within teaching and learning"*

School F (HoD F 6): *"More workshops are needed so that I can be 100% confident and be able to integrate my teaching with ICT".*

The responses from the HoDs were diverse; some found that the ongoing training is sufficient, while others felt that more training is needed. Participants showed that through exploring, they can learn more on their own than from training, although this is time-consuming. Training that takes place after school has proved not to be successful as teachers are tired, having taught the entire day and then needing to mark books and plan for the next day.

Even though teaches recognise the importance of integrating technology within their teaching and learning, the successful implementation is often hindered by obstacles such as resources-related factors associated with training, skills, knowledge and computer experience, in addition to attitudes and personal factors and institutional and cultural factors, which could include policy. When teachers begin to use technology from a ground-up approach and fully embrace technology, they will become more successful and ready to meet the needs and challenges of the 21st century classroom.

5.3.1.4 Research sub-question 4: Which instructional leadership skills does the HoD, as an instructional leader, need to effectively lead teams and teachers?

a) Theme 1: Development of ICT

The development of ICT focuses on the teacher knowledge and their skills in ICT-related issues. Lack of training puts teachers at a disadvantage since they cannot be

on par with new technological trends. Teacher development enhances teacher self-efficacy (Blonder *et al.,* 2013). Ng (2013), states that teachers should be mobile learning literate, digitally literate and empowered to learn more independently and safely when using mobile devices and their applications. The need for supplying professional development activities to improve teaching and learning is a practice normally advocated by the Department of Education. Those activities focusing on the teacher's competence and confidence at using ICT in their teaching, might need to receive more departmental attention as data collected suggest that teachers have extremely low attendance at ICT-related professional development activities. Their attendance was a consequence of access rather than desire.

The single most significant reason teachers should be professionally developed is based on the idea that the quality of teachers influences the quality of the learners' experience and achievement positively. The focus of staff development is on the professional learning of teachers and the establishment of classrooms as an important centre for teacher development. Dean (2002) believes that staff development shows the schools' commitment to developing all teachers effectively and to ensure job satisfaction. National and local accounting standards have placed major pressure on HoDs to achieve high academic standards for learners and schools by developing teachers in their departments. For the success of staff, development is dependent on the ability of the HoDs in managing and developing teachers and the support given to them.

b) Theme 2: Workshops supplying training to teachers and HoD for the development of ICT within the school

The correct training is necessary for educators to transform their traditional methods of teaching to new ways. The teachers are not offered training that would bring meaningful change in their use of ICT. Teachers believed that proper training should be supplied to allow them to develop skills in ICT usage. Teachers' ICT skills and competence is crucial for the success and sustainability of integrating the use of web-based technology resources in educational practices (Garba, Singh & Yusuf, 2013). Teachers must constantly be skilled in using technology to promote learner-centred learning (Blonder *et al.,* 2013). This, according to Bayat, Louw and Rena (2014), is

taking advantage of emerging technology to design and deliver education to promote understanding of concepts and develop digital literacy. Time and money should be invested in the improvement of teachers and teaching. To be effective as citizens within the 21st century, teachers must have functional and critical thinking skills such as information literacy, media literacy and ICT literacy (Aslan & Zhu, 2018). This would show that teachers need to be competent in the use of ICT. Innovative teaching has become necessary for all teachers to meet the educational needs of the new generation and the teachers' technology competency is related to their innovative teaching performance (Zhu, Wang, Cai & Engels, 2013).

(i) Analysis of teacher data

TF1: *"Only a workshop for two days or one day is not enough".*

TF2: *"Engage teachers on the basics like most of them never used computers before".*

TF3: *"After school, training is not good, as we are tired."*

TF4: *"T*he *training should be recognized by SACE for teachers to accrue PD points in the SACE continuous PTD system when they complete the training".*

TF5: "*HoDs' need to know about ICT so that they can help us and train us on it uses in the classroom*."

Teachers all agreed that workshops are especially important; however, the time and content is just as important. Being able to use what they are taught at these workshops is also important. The development of teachers cannot be overemphasised as an outdated manner of teaching and learning is not just uninteresting for the teacher but the learners as well. The absence of ICT in schools is due to a lack of training opportunities and facilities. Whether it is workshops offered by the Department of Education or private companies wanting to promote their businesses, are where teachers can receive ICT training on how to use the tools to help better learning and delivery of the curriculum. The training must also be combined with pedagogy related to ICT use. The training must also allow the teacher to build a broad knowledge base, develop their capabilities to process information effectively and efficiently. It should

also develop within them the attitude and capability for independent life-long learning. Successful in-service training must be able to meet the needs of the teachers. Those who consider the learning of new skills which are relevant and useful will have a personal stake in the type of training they receive. The content of the training is important in what they are taught, knowledge of computer terminology as well as the functions of computers. They also agree that HoDs need to be familiar with diverse types of ICT and its uses to be able to supply training for them on how to use it in their classrooms and when it comes to their planning.

(ii) Analysis of Heads of Department data

School E (HoD E 5): "It *is a challenge; I am using the knowledge I have, and it is not always enough".*

School F (HoD F 6): "*Dedicated training at universities could be offered. Supply ICT training for teachers so we can be confident in using it. Teachers also have a responsibility to take charge of their self-development and seizing opportunities that are available to them through forums such as the South African Council for Teachers (SACE), which is the teachers' own professional body, and the Integrated Quality Management System (IQMS)."*

The development of Heads of Department in the use of ICT is important as they are the key players in the teaching and learning process. Training and development also boost their self-efficiency, motivation and computer habits. The development of HoDs is needed and a crucial factor for the success of ICT within schools. The development of HoDs will allow them to access information and be able to accept the role of guide and facilitator. Through training, and technical and professional support, it assists teachers in reaching at least the basic level of ICT competency. HoDs can also help in curriculum and resource support thereby improving the delivery of curriculum through ICT. HoD development will also allow them to collaborate with school management, teachers, students, parents, the business sector and the community in general about the implementation of ICT within the school.

c) Theme 3: In-school staff development

The importance of in-school staff development will improve the schools' ethos, as well

as supply opportunities for teachers to change their practice by having improved educational content and better teaching and learning methods. In-school development is important as it leaves a legacy and supplies long-term benefits. Education is constantly changing and teachers should therefore constantly be developing and reinforcing their skills and knowledge. Staff development also coincides with the yearly Integrated Quality Management (IQM) process in which all staff within the school take part. Reflecting on their development in various areas within the education and school environment is an important part of this process. Participants said that if schools develop their staff, it will have a major impact within this area.

(i) Analysis of teacher data

TA2: *"I will become well developed on the use of ICT*"

TB3: *"In-school development will motivate me to change my teaching and learning*"

TC1: *"Every time something new comes out that teachers need to do such as reading program or a maths program, teachers have to attend professional development courses or workshops on it, but when it comes to technology, teachers are just expected to go with it.*"

The policy document, the White Paper on e-Education (DoE, 2004), requires that the use of ICT, as a set of flexible tools for teaching and learning, be integrated into Initial Professional Education of Teachers (IPET) and Continuing Professional Teacher Development (CPTD). ICT gaps within the teaching and learning process need to be addressed, whilst considering prevailing challenges in the education system concerning ICT integration and teaching and learning within the digital age. The development of teachers using ICT within the teaching process will not just be on the speedy delivery of content and curriculum completion but will lead to the construction of knowledge on the part of the teachers. Teachers will learn how to use resources to fit a topic they are preparing and then teach using ICT to present their work. The use of ICT will also allow teachers to give feedback about their experiences, research and implementation. Teachers will also be able to contribute to the school's professional life, keep information about earlier and current educational practices. They will also be

informed about various educational policies and thereby try to raise the standard of education, increase their knowledge and be able to communicate their ideas about ICT.

(ii) Analysis of Heads of Department data

School A (HoD A 1): *"It is something good for the future"*

School B (HoD B 2): *"The introduction of technology is a tool to enhance teaching. It cannot however replace the teacher. A teacher as we know has many roles to play in the life of a developing learner."*

School C (HoD C 3): *"More programs must be introduced by the department of education which will require all teachers to be fully trained for six months or one year*."

School E (HoD E 5): *"Development should be ongoing and not just a once-off*."

A consensus amongst the school management is needed to ensure that teachers are encouraged and supported within the school's context to develop professionally to achieve high-quality education. School management need not just implement ICT within their schools but they must prioritise it by giving funds towards its implementation. Management courses also need to be arranged to update them with new development in ICT and education in general. Likewise, for teachers to be able to reach pedagogical maturity, an environment is needed that would stimulate and support professional growth. What is needed to nurture professional teacher development is discussions with teachers as individuals and as groups to allow teachers to examine their current instructional practices and explore modern technology. Staff meetings should be arranged that focus specifically on instructional and curriculum matters where teachers can reflect on their current practices and look at new ways of exploring ways of how the quality of instruction and achievement could be enhanced. Meeting individually with teachers to discuss their current professional problems and supplying the necessary aid is also needed. Stimulating enthusiasm among teachers and enabling them to pursue further instructional or curriculum interests is just as important.

Professional development should be regarded as an important long-term issue by improving teachers' skills and capabilities by imparting knowledge to others. By developing and extending the skills and knowledge, the classroom performance of teachers is likely to be enhanced. Professional development is also a valuable tool for improving teachers' confidence and motivation which will allow them an opportunity to become innovative (Masuku, 2011). According to Toh (2013), technology leadership can make a meaningful difference in how well schools can realise the full potential of technology. The use of technology, according to Aslan and Zhu (2018), will make an important contribution to enhancing the teaching and learning process.

Supplying instructional leadership is of vital importance which cannot be overemphasised. The responsibility and accountability for ensuring that effective teaching and learning takes place falls on the shoulders of the instructional leaders, who in this research, are the Heads of the Department. To be effective as instructional leaders, HoDs must ensure that tasks are structured unambiguously, logically and clearly so that everyone can function effectively and efficiently (Masuku, 2011). Leadership that is not strong and where there is no change in thinking, keeping the status quo (difficulties in educator training and rising costs of infrastructure) will limit advances in professional development for teachers (Zavieri, 2014).

d) Theme 4: The Role of the HoD

The role of the HoDs is one of managing a department and being a class teacher at the same time (Bipath & Nkabinde, 2018). Furthermore, the role of the HoD is also to improve the quality of communication as well as setting up a collaborative relationship with teachers. The HoD must also be a supervisor through the administration of their department and supplying professional aid to teachers. What is more, the HoD also acts as a liaison between the principal and the staff, to supply instructional guidance to teachers as well as to plan, organise, command, coordinate, control and conduct delegated tasks (Bipath & Nkabinde, 2018). The role of the HoD falls in line with the Professional Administrative Measures (PAM) document which is to ensure that the professional competence of teachers is accessible to management in education, with a sense of duty and the belief that they can be effective.

Apart from the duties outlined above, the PAM document (DBE, 2016) also lists other core duties and responsibilities of HoDs such as teaching, coordinating extra- and co-curricular activities, checking of a phase, subject or learning area, administrative work, planning of the budget for the department and communication. Added to this, Bush (2004) also says that for the Heads of Department to be effective within their department, they need to be knowledgeable and accountable about their role to promote effective teaching and learning. The HoDs must also be knowledgeable about curriculum development, teacher and instructional effectiveness, supervision and teacher evaluation and staff development (ELRC, Resolution 8 of 1998) (Bush, 2004).

e) Theme 5: Creating a positive learning environment

According to Mestry (2017), the role of leadership within the school requires creating a positive learning environment, through motivating teachers and learners and effectively managing resources to enhance best educational practices. Similarly, Maingi (2015) states that the HoDs also have the responsibility to create a climate in which learning can take place and where teachers can work collaboratively and supportively in improving teaching and learning. In addition, HoDs are also tasked with creating a school culture conducive to professional growth, as well as ensuring there is open communication between the office, teachers and learners (Maingi, 2015).

Teachers' views regarding HoDs creating a positive learning environment were many and diverse. They mentioned issues such as social interaction between teachers and learners, managing classroom activities, participation in the learning process and learner discipline. Teachers also mentioned that HoDs have tried to develop and maintain a culture of teaching and learning through the requisition, utilisation and maintenance of resources such as textbooks and other teaching and learning support materials. Finally, teachers felt that HoDs continually support and guide collaborative work.

(i) Analysis of teacher data

TA1: *"HoDs are the main coordinators regarding everything that happens within their department and the school".*

TB2: *"They give direction and interpret information regarding curriculum implementation."*

TC3: *"HoDs bring to the attention of staff any added information regarding curriculum, examination, new teaching methods, textbooks, and other resources."*

Organising and creating a positive learning space within the classroom are important and necessary aspects as they contribute to the teaching and learning which takes place within the classroom. Teachers should be able to create an environment that is less threatening and intimidating, drawing those less confident learners into the class. The use of ICT within the classroom environment will allow the teacher to create lessons that will draw the interest of all learners and allow learning to take place at their level. By having a more organised teaching and learning environment, teachers can become more organised and feel more confident about their teaching as well as their ability to show proper leadership and management ability.

Creating a positive learning environment should be able to guarantee interpersonal relationships, where both teacher and learners are motivated, disciplined, recognised and acknowledged and resources for teaching are available. HoDs can contribute to this process by providing teachers with the necessary orientation before teaching takes place. This process would include supplying aims for tasks or lessons, how to assess learners and showing them how to find meaning in what they are learning.

Analysis of Heads of Department data

School A (HoD A 1): *"As HoD I need to assist teachers with the resources they need".*

School B (HoD B 2): *"By respecting, trusting and collaborating with teachers to use the resources I can give them."*

School C (HoD C 3): *"Allow teachers to express themselves freely."*

School D (HoD D 5): *"Having regular meetings and discussing issues that they have and collaborating with teachers in making decisions about teaching and learning."*

“Meetings are also an opportunity to address any shortcomings and to help teachers improve their skills in classroom management.”

Being listened to and taken seriously fosters a positive relationship between teachers and HoDs. It encourages a positive sense of self in both parties which can have an impact on the learning environment within the classroom. With the HoDs sharing their knowledge and ability about the use and integration of ICT, both teachers and HoDs can share its benefits and thereby increase enthusiasm for learning. Creating a positive environment for using ICT within the classroom can also have the effect of creating a greater subject appeal and arouse in teachers the desire to know more andencourage the independent study of learning. Teachers and HoDs will begin to experience greater enjoyment from what they are learning and become motivated to do more. The task of the HoDs is to equip the teachers with the necessary skills and to place them in an environment where they can use this technology as part of their daily activities. The HoDs also need to encourage the teachers to integrate ICT withintheir planning and delivery of curriculum rather than setting up barriers and creating unnecessary pressure and stress.

The role of the HoD as a leader is an essential element depending on their knowledge. HoDs, therefore, need to be creative in developing new initiatives in implementing ICT in teaching and learning. For teachers to use ICT more effectively in teaching and learning, HoDs could work towards creating a platform and incorporating it in cross-curricular teaching and learning with online teaching resources.

Theme 6: Professional development

The role of the HoD regarding staff development is important in developing staff members as subject specialists and managers. Each staff member must become proficient in being able to manage a subject. Issues such as human management and administration skills must be given special attention. The development of teachers should be about learning resulting in changes in skills, beliefs and attitudes through requiring new skills, concepts, proper knowledge and processes related to the act of teaching (du Plessis, 2014). Likewise, du Plessis adds that staff development is also a process where teachers continually renew, re-invent, enhance themselves in being

able to supply relevant teaching to allow effective learning to take place.

Professional staff development is a critical issue and reflects the school's commitment to develop teachers and to guarantee job satisfaction. According to Steyn (2003:6), as important as professional development is, having teachers who are knowledgeable about academics and able to use a variety of teaching methods to help learners, is also needed.

(i) Analysis of teacher data

TA1: *"Development of communication strategies is important as it will help teachers make choices and express opinions."*

TB2: *"Some teachers have insufficient knowledge about teaching to provide meaningful feedback." "Professional development is needed for those teachers."*

TC3: *"Teachers need to be challenged and given the skills to grow and develop."*

TF2: *"Development needs to be aligned with the school's priorities."*

Professional development of staff within the school is important as it adds value to the teaching and learning process. It also adds to the morale of the staff and their contribution to the school's development. Teachers who are developed within their subjects can contribute to the school's development and will be able to mentor others on the subject matter. The development of teachers also allows them to take part in extra and co-curricular activities offered by the Department of Education which will add to their further development. The development can also add to the teacher's portfolio thereby encouraging teachers to embark on ICT training and learning the required competencies.

(ii) Analysis of Heads of Department data

School A (HoD A 1): *"Professional development is important as it will providefeedback on performance which will support ongoing learning and development with afocus on ways in which learning can be improved."*

School B (HoD B 2): *"It is needed as it will enhance the capacity of teachers to apply for promotion posts."*

School C (HoD C3): *"It will provide a supportive environment for improving*

performance where standards are not met."

School D (HoD D5): *"It will provide us with opportunities to gain experience and develop new competencies."*

For HoDs to be effective, they need to be able to ascertain the capabilities of the teachers in their phase, subject or learning area and decide which are the most essential skills that need development. They should also be able to evaluate their teachers and themselves, thereby ensuring that they are creating a people-capability staff that reflects the aims of the school. The advantage of new tools and technologies should be taken into consideration by providing teachers with capacity-building training. The main aim of professional development is to aid people in developing the required competencies most effectively and efficiently and to support the learning process. Interventions should also be put in place that will support informal learning, through coaching and mentoring, on-the-job instruction, leadership shadowing and on-demand access to digital learning.

5.3.1.5 Research sub-question 5: What strategy model was implemented by the HoD to enhance the use of technology within the 21st century classroom

a) Theme 1: ICT skills and knowledge required by HoD to improve the quality of teaching and learning

Adekunle, Olumide and Olutayo (2019) state that education is a process through which learning, skills, beliefs, values and habits are helped. The importance of education cannot be overemphasised. They also say that the teaching and learning process is being restructured from the traditional face-to-face and chalk-to-board to a technology-based. Likewise, Wang (2015) adds that during the past two decades, there has been increasing attention in the use of ICT in education and that the role of the HoD is significant in implementing ICT within the school. The role of the HoD as ICT coordinator is firstly technical in nature, dealing with the details in repairing equipment, ordering and installing new software and hardware and secondly, to support teachers in teaching and learning, and to develop them in the use of ICT and its use in the classroom.

b) Theme 2: Knowledge of ICT

Wang (2015) states that ICT coordinators are curriculum leaders and thereby recommend that schools develop a framework where Heads of Department collaborate with teachers to design ICT-mediated lessons and share resources and lesson plans. HoDs also need to provide training for teachers and they can, through a buddy system, pair experienced teachers with beginner teachers to help them integrate ICT into the lesson. The HoD needs to use ICT within the school and thereby contribute to educational change.

(i) Analysis of teacher data

TA1: "*It is helpful if the HoDs' know something about computer programs and can teach us how to use them e.g., SA SAMS".*

TB2: *"HoDs can show us how to integrate ICT in our lessons if they can use the computer."*

TC3: *"HoDs and teachers need to work together and share what they know about computers."*

As schools make more use of technology, teachers' ability to understand and use the knowledge of ICT has become important within the school. Teachers will also be able to spend more time on teaching than planning and be able to share their knowledge and experience with others. They are also able to interact with facilitators within the Department as well as teachers from other schools. Teachers are also able to become part of groups and thereby communicate with group leaders and facilitators directly. Teachers who are unable to attend meetings could access the information through the necessary platforms created and supply feedback if necessary.

(ii) Analysis of Heads of Department data

School A (HoD A 1): *"Understanding the different computer programs are important."*

School B (HoD B 2): *"It has become important for HoDs to be able to use the computer and understand the different programs."*

School C (HoD C 3): *"It has become mandatory for the HoDs to communicate with others through the use of computers e.g., zoom, webchat."*

Both teachers and HoDs agree that it is important to not just know how computers work but understand the different computer software and programs. HoDs can communicate with subject advisors, facilitators and HoDs from other schools and share ideas and discuss various issues. By having the skills and knowledge, HoDs could prepare for times when challenges such as load shedding, computer break down and outdated resources surface.

5.4 CONCLUSION

This chapter dealt with the presentation and analysis of data collected through an open-ended questionnaire which participants had to complete. The contexts of the schools were described and the characteristics of participants were tabled to give a background to the findings. This was followed by categorising the data into themes and sub-themes. After the data were collected and transcribed, themes were found, and the analysis and the discussion were used. The major themes found were: Understanding of 21st century classroom, Skills HoDs need to be effective in leading their teams, the contribution HoDs can make to the use of technology, the role of the HoD in designing, implementing and supporting the use of technology and the model they would implement to be more effective in the use of technology.

The concluding chapter (Chapter six) will bring the study to a close by focusing on the findings and recommendations based on the data analysis.

CHAPTER 6

SUMMARY, FINDINGS, RECOMMENDATIONS AND CONCLUSIONS TO THE STUDY

6.1 INTRODUCTION

The earlier chapter focused on data presentation and analysis of the views of the participants on the instructional leadership role of the HoD in South African primary schools and to enhance the use of technology. The study aimed to show the leadership roles and skills the HoD would need to be an instructional leader as well as the technical skills needed to improve the use of computers within schools and the support that they would provide to teachers to become more effective in their use of technology. Therefore, the researcher used a qualitative data collection approach and pertinent data was collected from HoDs and teachers in primary schools using an open-ended questionnaire.

In this chapter, the summary of the study is supplied while the findings and recommendations regarding the research questions are presented to improve the instructional leadership practices of HoDs in primary schools. Finally, the limitations of the study, the contribution of the study, and concluding remarks were presented.

6.2 A BRIEF OVERVIEW OF THE STUDY

Chapter 1 was an orientation to the study and highlighted the context of the study. It included the study rationale, the research question and sub-questions, the aim and objectives, the research methodology, its contributions to existing knowledge, ethical aspects as well as the trustworthiness of the study. The chapter concluded with definitions of the key terms used in the study. Chapter 2 and 3 are both literature studies.

Chapter 2 focussed on concept of leadership, as well as leadership within the school context. The chapter also discussed the concept of instructional leadership and the role of the HoD as an instructional leader were also covered in this chapter. It also addressed the topic of technology-based education within the 21st century classroom,

as well as the leadership styles and skills that the HoD would require in order to successfully integrate technology-based education within primary schools.

Chapter 3 discussed the function of ICT in the educational context, as well as the role of ICT in classroom instruction and the development of digital citizen skills. It also explored teacher education, with a focus on ICT access in teacher education. The chapter also looked at the e-Education White Paper, a feasibility study for an e-Education initiative in South Africa, and a National e-Education implementation strategy in the context of ICT policy development in the educational setting. In addition to South Africa, the chapter explored policies and practices that encourage the use of ICT in education in a few other nations. The chapter concluded with a discussion of ICT resources and functions in primary schools in South Africa.

Chapter 4 presented the research methodology which guided the study, whileChapter 5 included an analysis and presentation of the data obtained. The last chapter includes a summary of the study while the findings of the study as well as the recommendations from the study are discussed.

6.3 SUMMARY OF THE STUDY

The goal was to assess the extent to which the study questions were answered, as well as to contribute to current knowledge and ongoing discussions in the field. It can, therefore, be stated that the main research question of the study was presented and discussed in terms of the instructional leadership skills of the HoD and the use of ICT within the primary school classroom.

6.3 FINDINGS FROM THE STUDY

In this section of the study, the findings of the study will be discussed with regard to the sub-questions of the study. The data analysis method used in this study was qualitative. Hence the analysis conducted led to the following findings (*cf.* Section 1.2).

6.4.1 Research Objective 1: Define and explain the concept of the 21st century classroom

The first sub-research question (*cf.* Section 1.2) was aimed to identify the 21st century classroom, and according to the research conducted for this study, can be defined as a process in which traditional classrooms are modified and changed by incorporating technology into the teaching and learning process (*cf.* Section 3.2.2). Using computers, smartboards, and whiteboards in the classroom as part of the furniture is different from integrating technology into the teaching and learning process to help students in learning and acquiring 21st century abilities.

Instead of students copying work from the board into their workbooks and just filling out worksheets while listening to the teacher explain the lesson, the teacher might have pre-recorded lessons based on the topics that students may watch and listen to. This will make the class more engaging and supply more time for the teacher and learner to discuss what is being taught. The focus in the classroom will not be on the teachers, as it is in a typical classroom, but on the students, who will be given opportunities to develop skills such as critical thinking, collaborating, and working with others in problem-solving (*cf*. Section 2.5.2.2).

Having computers in the classroom will also allow the teacher to spend less time and paperwork on lesson planning, going through textbooks, and photocopying pages of work that students must learn and finish. Students would be able to use computers to complete and alter lesson plans and work schedules, as well as access a variety of materials to set up more exciting courses and activities (*cf.* Section 3.2.3).

The use of computers in the classroom will make the teaching interesting and fascinating, and students will be more focused on what is being taught and learned. Learners can also check their progress and success using computers, as well as receive rapid feedback from their teachers. Learners will also have several opportunities throughout the year to go back and redo work to enhance not only their grades but also what they are learning.

Summary of finding 1: Traditional classrooms and teaching and learning methods must evolve to create a classroom where the teaching and learning process is dynamic

and creative. By including more hands-on activities, students are challenged todevelop the skills needed to compete with others. Thus, with a shift of mindset, engaged and invested teachers with the support of the HoD may construct 21st centuryclassrooms.

6.4.2 Research Objective 2: Explain how the HoD can contribute to the effectiveness and improve the use of technology within 21st century classrooms

The 21st century classroom is one in which technology is integrated into a flexible learning environment that encourages students to learn (*cf*. Section 3.2.2). Learning is brought to life, which means it becomes more real and relevant to current events. It is a collaborative, interactive learning setting in which the teacher, as the facilitator, and the learners have the tools to communicate, collaborate, share ideas, become analytical people, obtain more information on the subject matter, examine, and analyse that material (*cf*. Section 2.7).

All of this is thought to be possible given the HoD's abilities, ability and assistance. According to the findings of this study, the HoD must be both a class teacher and manage their phase by developing the curriculum, checking and delivering excellent teaching and learning. The HoD must be technologically literate and have the necessary skills, knowledge and aptitude to apply and integrate technology into the topics. All of this is an impossible undertaking for which the HoD appears to have no time on their hectic agenda. When it comes to being able to use technology, they are expected to model or give the idea of a more competent individual. The questionnaire results revealed, however, that the HoDs in the study have little or no access to technology, and those who have poor comprehension and ability in ICT (*cf*. Section 2.7).

HoDs can help teachers integrate technology into the teaching and learning process in a variety of ways but limiting their use of technology is ineffective. This could change if HoDs receive the necessary training to provide them with the knowledge and abilities to help not only the teachers in their phase but the entire school (*cf*. Section 3.3.3).

Summary of finding 2: The HoD's contribution to being technologically literate is critical in aiding the teaching and learning process in a 21st century classroom. However, unless they have the knowledge and ability to use technology themselves, they will be unable to help others in being effective. They would also be unable to contribute to the establishment of a 21st century classroom that is technologically based. The HoD can improve classroom performance by helping teachers in incorporating technology into lesson planning. This will aid in the development of important 21st century skills that learners need for successful learning and thriving in a world where there is uncertainty.

6.4.3 Research Objective 3: Discuss the role of the HoD in designing, implementing and supporting an effective technology model for the 21st century classroom

This study's research has underlined the important function that the HoD plays in the school's contribution to the teaching and learning process (*cf*. Section 2.7). The function of the HoD can be expanded by using their ability, understanding, and experience to create a curriculum or guide that teachers can use in their practice. The curriculum, teaching plans, or guide could include, among other things, what teachers must teach and what results must be reached for the diverse topics being taught (*cf*. Section 2.2.3). The incorporation of technology into lesson plans that will help and enhance the teaching and learning process is critical. The HoD would be knowledgeable of how technology could be used in the classroom and would help teachers in adjusting their teaching to their students' learning styles. Because today's students and those to come have grown up with technology, the HoD must help teachers in ensuring that students are equipped with skills and have the confidence to put these into practice. Learners must also develop the four important abilities defined as "Skills for Today," namely creativity, critical thinking, communication and cooperation (Bishop, 2009) (*cf*. Section 3.3).

By organising workshops within the school, the curriculum may be introduced, discussed, and realistically shown to teachers on how to implement it using technology within the school. Allowing teachers to offer ideas and suggestions for the development of a technology model for 21st century classrooms may ensure that the

teaching and learning process is improved and supported, resulting in better learner outcomes (*cf*. Sections 3.3.2 & 3.3.3).

Summary of finding 3: The HoD's role is critical in cooperating with teachers to ensure that the technological knowledge and skills needed to create, implement, and support a technology model for the 21st century classroom are gained and developed.

6.4.4 Research Objective 4: Explain which 21st century leadership skills the HoD, as instructional leader, needs to effectively lead teams and teachers

Various people have discussed and offered a variety of definitions of leadership and talent (*cf*. Section 2.2). Before tackling the research question, it is a clever idea to have a look at what leadership and talents are not.

The ability to influence people working toward the school's purpose or vision is more important than the position or title the HoD holds within the school (*cf*. Section 2.2.1). The ability to urge people to establish a course for where they need to go to make it practical and a reality, is leadership ability. It is not enough to have a positive attitude, go the added mile, or accomplish things without the necessary knowledge, expertise and practice. However, skills are about doing things right and having the information and experience to know how to do it, as well as using that knowledge and experience to influence others and show them how to do it.

With a clear understanding of what leadership and skills are not, we can now respond to the research question of what abilities the HoD needs to lead teams and instructors effectively. HoDs can work toward adopting technology in their schools if they have knowledge and awareness of the 21st century classroom, knowing that using computers can help students develop the experience and abilities they need to share with others (*cf*. Section 2.2.3).

Summary of finding 4: Leadership and talent are inextricably linked, and acquiring, developing and then honing their knowledge, skills, and understanding is crucial to their success as a leader.

6.4.5 Research Objective 5: Describe a strategy model that might be implemented by the HoD to enhance the use of technology within the 21st century classroom

The strategy model implemented by the HoD must be specific in terms of the sort of model and how it will fulfil the school's purpose or vision, as well as the resources needed to do so. The model must be interactive for others to contribute. It must be based on attainable outcomes for both teachers and students. It must also include both a practical and a theoretical part to assist HoDs in developing an action plan to select the best approach for the school to attain their goal. It must also be a model that emphasises the necessity of using technology in the classroom in the 21st century and can be applied to improve teaching and learning in school. The model must also be in-line with policy development (*cf*. Section 3.4).

Salam (2015) describes a system's approach as an example of a model in which things are done methodically. He adds that while educating methodically, intake, process, and output must all be considered. To develop competent and confident learners, the input, process and output must all have the correct mix of curricular goals, materials, techniques and assessments. The inputs are the goals and material created by teachers and HoDs, and the process is how the content is delivered. The educational inputs and procedures culminate in the results.

Summary of finding 5: The type of model decides the school's orientation, as well as the outcome.

6.5 RECOMMENDATIONS FROM THE STUDY

This section presents the recommendations regarding each sub-research question based on the findings from the data and the conclusions drawn from the study. The recommendations are made to improve the instructional leadership role of the HoD within primary schools in South Africa while enhancing the use of ICT within the classroom. The recommendations are discussed in the next section.

6.5.1 Recommendation Research Objective 1: Define and explain the concept of 21st century classrooms

The establishment of 21st century classrooms is conceivable, but adjustments must be done. Not only must learners become more active and get critical thinking skills, but teachers must also go through these changes in their teaching approach and methods (cf. section 2.5).

Teachers should attend workshops and training to learn and expand their computer abilities, as well as get familiar with how to use them in their lesson plans. Teachers must learn how to conduct web searches, find and use added online resources, as well as present their lessons using a computer/interactive whiteboard, to incorporate technology into the teaching and learning process (cf. section 3.3).

It is also suggested that learning approaches and methods be considered to ensure that the tasks that learners must complete are in line with 21st century pedagogy. The activities that learners do must foster skills like creativity, critical thinking, problem-solving, collaboration, and ICT abilities, which are essential in a 21st-century classroom.

Another suggestion is that legislators consider what needs to be included in policies to ensure that the types of abilities needed in a 21st-century classroom are taught and that evaluations work toward generating an outcome that allows learners to compete with others (cf. section 3.4).

Summary of recommendation 1: It is critical in creating an atmosphere that is conducive to the growth of 21st-century learning, as well as one that reflects the evolution of technology's use in the teaching and learning process.

6.5.2 Recommendation Research Objective 2: Explain how the HoD can contribute to the effectiveness and improve the use of technology within the 21st century classroom

According to the findings, HoDs can only contribute to the effectiveness and enhancement of technology use in a 21st century classroom if they can model the knowledge and abilities needed for technology use. This could be achievable if the

HoDs are instructed how to use technology and so develop the necessary knowledge and abilities. However, the HoD's obligations and responsibilities at the school do not allow for extra time, thus it is a question of when, where, and how this training will take place.

It is suggested that the functions of the HoD be delegated to senior teachers within the phase, to supply in-service professional development and the opportunity for those teachers interested in becoming HoDs to do so. This would allow HoDs to use their time to attend workshops and courses to learn not only about technology but also how to integrate it into their disciplines. These newly acquired skills would enable students to be more creative in their use of technology in the classroom and in creating methods to share that information with the teachers in their phase (*cf*. Section 2.7).

Summary of recommendation 2: Technology can only improve teaching in a 21st century classroom if HoDs have acquired and developed the necessary skills and abilities.

6.5.3 Recommendation Research Objective 3: Discuss the role of the HoD in designing, implementing and supporting an effective technology model for the 21st century classroom

As proven by the data, the importance of the HoD cannot be neglected because they serve as an important link between teachers and the principal, and their contribution to the development of the school is critical. The HoD's role in designing, implementing, and supporting a model for usage in a 21st century classroom can be conducted by putting policies in place that provide guidelines and foster best practices within the school. The formulation of school-specific policies, guided by national policies, will help the school to explain to others what is expected of them and what their roles and contributions should be (*cf*. Section 3.4).

The recommendation is also that policies be produced through consultation with others about the content, the sort of school for which they are being developed, and that they are straightforward enough for everyone to comprehend. It is also recommended to explore ideas from other schools when developing a model that will work in a 21st century classroom (*cf*. Section 3.5).

It is suggested that any model be given a performance evaluation to determine whether it has achieved the goals intended and whether any changes would need to be made.

Summary of recommendation 3: The HoD's role is critical in ensuring that they can use their knowledge and abilities to design, implement, and support an effective technology-based model in a 21st century classroom.

6.5.4 Recommendation Research Objective 4: Explain which 21st century leadership skills the HoD as an instructional leader need to effectively lead teams and teachers

Leadership and skills are inextricably linked concepts. It is necessary to supply opportunities for HoDs to expand their knowledge and ability through practical activities for them to become effective. It is also necessary to develop abilities in understanding how to conduct things with the proper attitude, as well as the ability to exchange ideas, collaborate and communicate.

Learning and practically doing things are recommended. However, this can be difficult for some institutions that lack the necessary resources. To gain access to resources, you must be creative and collaborate with others. The use of technology as part of the teaching and learning process is needed in the 21st century classroom, and it is therefore vital that the HoD have the skills described in the findings, to motivate and influence others to work toward a goal or vision for the school (*cf*. Section 2.2).

Summary of recommendation 2: The HoD needs to develop themselves before they can develop and support the teachers.

6.5.5 Recommendations Research Objective 5: Describe a strategy model which might be implemented by the HoD to enhance the use of technology within the 21st century classroom

According to the findings, the role of the HoD is to help and support teachers in using ICT in their teaching and learning. But, to conduct this goal, they must first understand how to use ICT. To be effective in their job as instructional leaders, HoDs would require the knowledge, skills, values, and attitude, as well as the necessary help, to acquire and understand how to use and integrate ICT within the teaching and learning

process. A set of guidelines to help HoDs in their role as instructional leaders in using ICT would be beneficial to them, and may contain, among other things, the following:

- The technical ability to select, use and support ICT resources to increase personal and professional performance, as well as pedagogical knowledge and implementation of the opportunities for using ICT for teaching and learning.
- Willingness to keep their knowledge and abilities up to date considering new advancements.
- The ability to collaborate with others and network with them.
- Gaining a better understanding of what ICT is capable of.
- Making use of information and communication technology (ICT) to help with teaching and learning.
- Using information and communication technology to support new teaching and learning methods
- Recognising that ICT growth is not a one-time event and that it affects their role as instructional leaders.
- Through a community of practice and the help of others in gaining ICT skills, the professional development of HoDs would have an impact on the entire school's development.

Summary of recommendation 5: The value of computer literacy in the classroom cannot be overstated. Because the HoD has a major influence on the teaching and learning process, it is incumbent upon them to take the lead in initiating, modelling, and encouraging the usage and deployment of ICT within the school.

6.6 THE CONTRIBUTION OF THE STUDY

The research's contribution was to clarify the concept of 21st century learning, the role of the HoD in designing, implementing, and maintaining an effective technologymodel for 21st-century classrooms, the HoD's instructional leadership skills in using ICT to improve teaching and learning in the classroom, and the strategy model that the HoD could use to enhance the use of technology in 21st-century classrooms.

The following contributions will have far-reaching consequences for the school, students, teacher preparation and planning, classroom instruction, and training and professional development.

6.6.1 Contribution to Knowledge

The purpose of this research was to examine the HoD's instructional leadership role in enhancing the use of technology in primary school classrooms. The study tried to respond to the following research question: **What is the instructional leadership role of the Head of Department (HoD) in South African primary school classrooms to enhance the use of technology-based education?**

The findings will add to the theory and body of knowledge by:

- supplying a foundation for further study
- supplying insight into the HoD's challenges as an instructional leader
- research that will shed light on the concept of 21st century learning.
- The incorporation of a qualitative study approach to research and literature on the role of the Head of Department as an instructional leader in South African primary schools, as well as their potential to improve the use of technology in the classroom in general.

The researcher was also able to gather information on the issues faced by department heads and the need for professional development programmes because of this investigation.

6.6.2 Contribution to Policy Debates and Policy Formulation

The research can help with policy debates and development on a variety of levels. The use of ICT in schools has resulted in many changes, and rules at all levels are essential. Various countries in and outside of South Africa have devised and implemented policies to ensure a balance between the expansion of ICT in society, its integration into schools, and its use in the teaching and learning process. It is therefore critical that education departments review their policies to ensure that they are effective in educational practice. These policies should include, among other things, the

development of an ICT plan, leadership from principals, access to ICT facilities, professional development for teachers, and the integration of ICT into the teaching and learning process. ICT policies can help to define a set of goals and a vision for how the education systemshould work while using technology.

6.6.3 Contribution to Practice

The purpose of this research was to understand more about the role of the HoD as a leader and how ICT is used in the classroom. This was done by recognising the issues with the leadership styles of the HoDs, as well as the challenges teachers encounter when incorporating ICT into the teaching and learning process.

Contributing to practice has resulted in the development of a strategy model. To meet the school's goal or vision, this model has to be unique. Instructional leaders in schools must make certain that every student and teacher has a positive learning and teaching experience. School leadership is second only to teaching in terms of its power to influence both teachers and students, according to the American Association of School Administrators (ASA) (2015).

This model is not intended to reflect the entirety of instructional leaders' work, but to describe the most visible components of instructional leadership. It is advised that when applying the strategy model, the following challenges be addressed:

- The model must show the goals that must be met as well as the direction that the school is taking; it must also show how it will achieve the goal, what it will do and how it will do it.
- The approach should also address the resources needed to improve technology use.
- Conduct a SWOT analysis to prove the school's strengths, weaknesses, opportunities and threats in assessing the use of technology in the 21st century classroom.
- The model must also enable the school to assess its success and/or failure.

- It must also be subjected to performance analysis to prove if it has achieved its goal, as well as the ability to assess contributions to its success and failure.

The strategy model is critical because it determines the type of plan that will be implemented and how it will benefit the school. Strategic leadership is essential for the development of successful schools. Strategic leadership can only aid the school if the school's vision and mission are turned into action. This translation can take many forms, including oral, which refers to how people interact, written, which includes official statements and goals, and structural, which refers to the infrastructure that supports and promotes the strategic approach by organising futures or strategic meetings (Davies & Davies, 2006). The development of a strategic model includes not only a plan but also an image of what classes might look like and how schools might continue with them. Strategic leaders must understand how their schools will deliver in the future, challenge the existing quo, and improve the future. The following is a suggested strategic model for consideration.

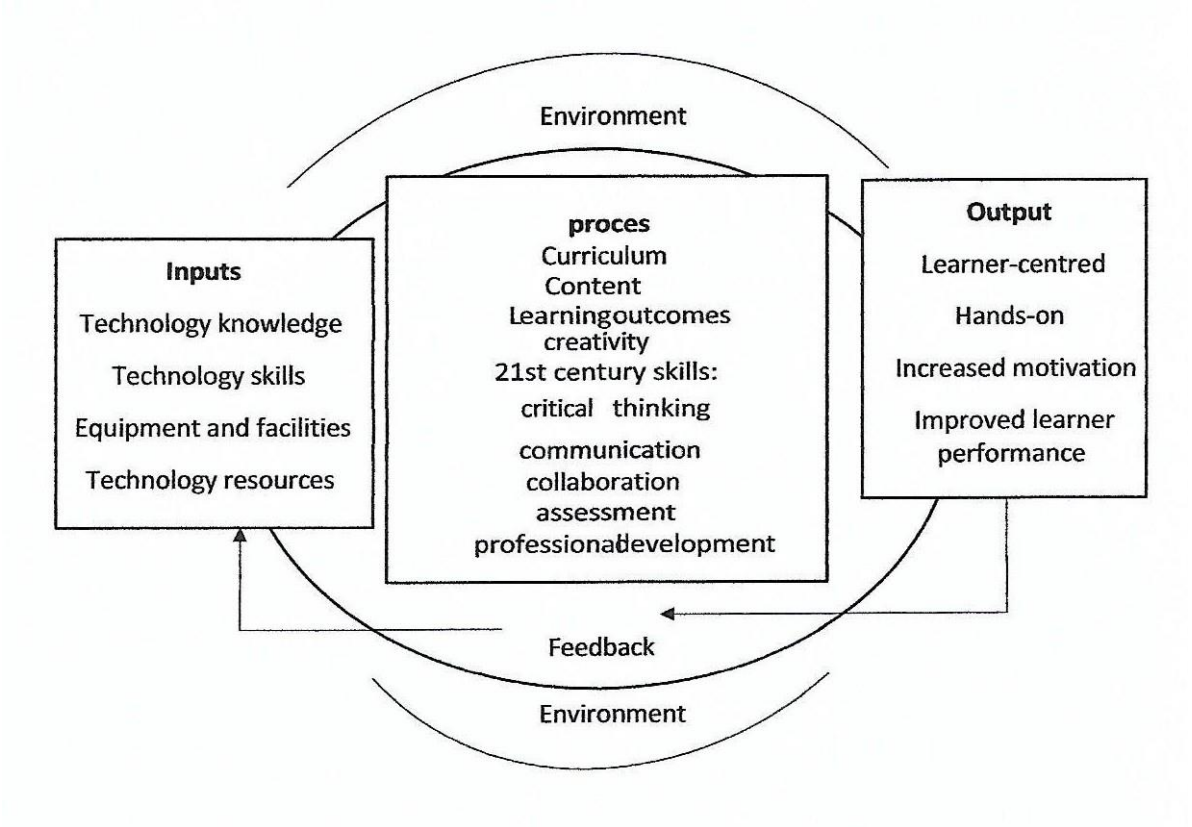

Figure 6.1: Strategy model (Arends, 2020)

6.6.4 Contribution to Teaching and Learning

Instructional leadership focuses on curriculum, instruction and professional development, all of which are important components of the teaching and learning process. It can contribute to the teaching and learning process by fostering collaboration among all stakeholders, including teachers, HoDs, and principals, by employing a distributive manner. Leadership positions can be shared, which improves the teaching and learning process.

6.6.5 Contribution to Future Research

The purpose of this research was to examine the function of the Head of Department in instructional leadership in selected primary schools in the Johannesburg South district. Because it was a case study and did not cover a large geographical area, it welcomes future inquiry by other researchers and can be an initiative for researchers to cover a large area with diverse variables. As a result, this work can serve as a springboard for added research and contribute to the body of knowledge.

6.7 LIMITATIONS AND DEMARCATION OF THE STUDY

The primary goal of this study was to investigate the HoD's instructional leadership role in selected primary schools to increase the usage of technology-based education.As a result of the researcher's background and involvement in the study, the institution,the research design, environment, and participants in the study, the study had certain limitations. Knowing these constraints enabled the researcher to introduce approaches that reduced or ended their influence on the research outcomes. The constraints listed below are intended to inform and guide future research:

- Because the study was restricted to only six schools in the district, it cannot be applied to other primary schools.
- The study focused solely on urban schools, such as public primary schools, and excluded independent and private schools.
- The study's sample size was small. Using a non-probability purposive sampling method resulted in knowledge being excluded from the rest of the population. Anonymity and confidentiality were also a concern, particularly when it came to showing the findings given the restricted size of the research

sample.

- The problem can be solved by employing a larger sample size in future studies.
- The study accommodated participants' resistance by responding to research queries and keeping appointments. Some participants were intimidated by using the study devices. The researcher's point of view was the sixth restriction of this study.
- This personal epistemology was a constraint because it influenced the study's research design and procedure.

The question was whether the data generated by the study was relevant for obtaining information about the instructional leadership role of the HoD in selected primary school classrooms in promoting the use of technology-based education. The amount of data received from the surveys was a limitation. It may have been a better decision to gather fixed and statistically measurable data from participants to gain different insights. This large amount of data takes time to transcribe and analyse, which could have resulted in the omission of valuable information and leads.

Despite the limitations mentioned, it should be noted that the study can add to the body of knowledge on the function of the HoD and the use of ICT in the 21st century classroom, which is still growing and supplying direction for future research. Regardless of the limitations, if is felts that the study's findings are still reliable and that the limitations could be addressed by revising the research design as well as the collection of data and the methods of analysis.

6.8 CONCLUSIONS

The purpose of this study was to investigate the HoD's instructional leadership skills in the use of technology in a sample of South African primary schools. The study also included the concept of leadership as a position of sharing ideas and supplying possibilities, as well as being effective and having an influence on others and doing the right thing. The study was also based on the notion of instructional leadership, which is used to manage, supervise and improve the teaching and learning process, as well as to provide teachers with tools and a proper atmosphere in which to teach. It

also includes the usage and integration of ICT in the 21st century classroom. The importance of HoDs in connecting ICT and teachers in their classrooms cannot be overstated. Then it is correct to argue that HoDs have defined obligations as well as being accountable, and their effect can be both horizontal and vertical.

According to the literature review, HoDs will need to be experts not only in their subjects and pedagogical methods, but also in developing, implementing and evaluating professional development activities and strategies for teachers to develop new skills and knowledge about using ICT in the teaching and learning process. As a result, HoDs must be skilled at managing and leading their departments to success. HoDs must guarantee that quality development and practices are in place at schools for them to be effective as instructional leaders. It is the principal's and the school SMT's responsibility to ensure that ICT policies for classroom and school use are created, implemented and checked for successful teaching and learning to take place.

When used effectively, technology may be a powerful tool for positive change. Steps must be taken to have a positive effect on the teaching and learning process. School leaders, in collaboration with their SMTs, must plan for everyone to be able to use technology. Teachers must change the way they teach, plan and organise, as well as learn to collect, analyse and produce projects using technology. Teachers must also be able to educate in a way that has the greatest impact on learning, and technology supplies the means and flexibility to do so. To fulfil the needs of the modern learner, a shift in thinking from the old approach of teaching without technology is needed.

Technology and the internet have become an integral element of daily life. The use of technology for efficient teaching and learning is one of the key vehicles of the twenty-first century. Technology, while not a complete solution, is a step in the right direction.

We need technology in every classroom and every student and teacher's hand because it is the pen and paper of our time, and it is the lens through which we experience much of our world.

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APPENDICES

Appendix A: Ethical Clearance

UNISA university of south africa

UNISA COLLEGE OF EDUCATION ETHICS REVIEW COMMITTEE

Date: 2019/11/13

Ref: **2019/11/13/45915156/19/AM**
Name: Mrs AM Arends
Student No.: 45915156

Dear Mrs AM Arends

Decision: Ethics Approval from 2019/11/13 to 2024/11/13

Researcher(s): Name: Mrs AM Arends
E-mail address: audrey.a@ li ve.com
Telephone: 072 737 5884

Supervisor(s): Name: Prof N Botha
E-mail address: botharj@unisa.ac.za
Telephone: -

Title of research:

The instructional leadership role of the Head of Department in South African primary school classrooms in enhancing the use of technology-based education

Qualification: DEd in Education Management

Thank you for the application for research ethics clearance by the UNISA College of Education Ethics Review Committee for the above mentioned research. Ethics approval is granted for the period 2019/11/13 to 2024/ 11/ 13.

*The **low risk** application was reviewed by the Et hics Review Committee on 2019/11/13 in compliance with the UNISA Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.*

The proposed research may now commence with the provisions that:

1. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Et hics.
2. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the UNISA College of Education Ethics Review Committee.

University of So ut h A frica
Preller Street. Muckleneuk Ridge. C,tyof Tshw ane
PO Box 392 UN/SA 000 3 Sout h Africa
Telephon e. + 27 1 2 429 31 11 Facsim ile + 27 12 429 4 1 50
ww w.unisa.ac.za

Appendix B: Request for Permission to Conduct Research in GDE Schools

The Head of the District
Johannesburg South District
21 August 2019

100 Northern Parkway Drive
Crownwood Office Park
Ormonde
2091

Dear Sir

REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN SCHOOLS

My name is Audrey Arends, student number: 45915156. I am a student at the University of South Africa in the College of Education under the supervision of Professor Botha. The research I wish to conduct for my DED studies involves the instructional leadership role of the Head of Department in South African primary school classrooms in enhancing the use of technology-based education.

The purpose of this study is through the instructional leadership role of the HoD within the primary school using ICT to enhance teaching and learning through the process of teacher training and access to ICT.

I am hereby seeking your consent to visit primary school teachers in Johannesburg (Johannesburg South District) to distribute a questionnaire regarding ICT usage in teaching and learning across the school curriculum. I have attached a copy of my proposal.

The participant's identity will be anonymous and what will be answered on the questionnaire will be kept in the strictest confidentiality. Their participation is voluntary, and they may withdraw from participating without any consequence. The completion of the questionnaire will take 20 to 30 minutes of their time to complete. There will be no compensation for participating in this study.

The report of the findings of this research study will be communicated to all the participants and I can be contacted at audrey.a@live.com or 0727375884. Thank you for your consideration. Your help is greatly appreciated.

Yours sincerely

A.M. Arends

Appendix C: Letter of Consent

GAUTENG PROVINCE

Department: Education

REPUBLIC OF SOUTH AFRICA

8/4/4/1/2

GDE RESEARCH APPROVAL LETTER

Date:	**22 August 2019**
Validity of Research Approval:	**04 February 2019- 30 September 2019** **2019/243**
Name of Researcher:	**Arends A.M**
Address of Researcher:	**7 Marilyn Street, Extension 4**
	Rosettenville
	Johannesburg,2019
Telephone Number:	**011 613 3522**
Email address:	**audrey.a@live.com**
Research Topic:	**The instructional leadership role of the Head of Department in South African primary school classrooms in enhancing the use of technology-based education.**
Type of qualification	**Degree in Education**
Number and type of schools:	**Six Primary Schools**
District/s/HO	**Johannesburg South**

Re: Approval in Respect of Request to Conduct Research

This letter serves to indicate that approval is hereby granted to the above-mentioned researcher to proceed with research in respect of the study indicated above. The onus rests with the researcher to negotiate appropriate and relevant time schedules with the school/s and/or offices involved to conduct the research. A separate copy of this letter must be presented to both the School (both Principal and SGB) and the District/Head Office Senior Manager confirming that permission has been granted for the research to be conducted.

The following conditions apply to GDE re The research may proceed with the above study subject to the conditions listed below being met. Approval may be withdrawn should any of the conditions listed below be flouted:

1. *Letter that would indicate that the said researcher/s has/have been granted permission from the Gauteng Department of Education to conduct the researchstudy.*
2. *The District/Head Office Senior Manager/s must be approached separately, and in writing, for permission to involve District/Head Office Officials in the project.*
3. *A copy of this letter must be forwarded to the school principal and the chairperson of the School Governing Body (SGB) that would indicate that the researchers have been granted permission from the Gauteng Department of Education to conduct the research study.*
4. *A letter I document that outline thepurpose of the research and theanticipated outcomes of such research must be made available to the principals, SGBs, and District/Head Office Senior Managers of the schools and districts/offices concerned, respectively.*
5. *The Researcher will make every effort obtain the goodwill and co-operation of all the GDE officials, principals, and chairpersons of the SGBs, teachers, and learners involved. Persons who offer their co-operation will not receive additional remuneration from the Department while those that opt not to participate will not be penalized in anyway.*
6. *Research may only be conducted after school hours so that the normal school program* is *not interruptedThe Principal (if at* a *school) and/or Director (if at* a *district/head office) must be consulted about an appropriate time when the researchers may carry out their research at the*
   sites that they manage.
7. *Research may only commence from the second week of February and must be concluded before the beginning of the last quarter of the academic year. If incomplete, an amended Research Approval letter may be requested to research in the following year.*
8. *Items 6 and 7 will not apply to any research effort being undertaken on behalf of the GOE. Such research will have been commissioned and be paid for by the Gauteng Department of Education.*
9. *It is the researcher's responsibility to obtain written parental consent of all learners that are expected to participate in the study.*
10. *The researcher is responsible for supplying and utilising his/her own research resources, such as stationery, photocopies, transport, faxes, and telephones, and should not depend on the goodwill of the institutions and/or the offices visited for supplying such resources.*
11. *The names of the GDE officials, schools, principals, parents, teachers, and learners that participate in the study may not appear in the research report without the written consent of each of these individuals and/or organisations.*
12. *On completion of the study, the researcher/s must supply the Director: Knowledge Management & Research with one Hard Cover bound and an electronic copy of the research.*
13. *The researcher may be expected to provide short presentations on the purpose, findings, and recommendations of his/her research to both GOE officials and the schools concerned.*
14. *Should the researcher have been involved with research at* a *school and/or* a *district/head office level, the Director concerned must also be supplied with* a *brief summary of the purpose, findings, and recommendations of the research study.*

The Gauteng Department of Education wishes you well in this important undertaking and looks forward to examining the findings of your research study.

regards Mr. Gumani Mukatuni

Acting CES: Education Research and Knowledge Management DATE: ...2.11ss\..o. ...\2.0l9...

Office of the Director: Education Research and Knowledge Management

7th Floor, 17 Simmonds Street, Johannesburg, 2001 Tel: (011) 355 0488

Appendix D: Request to Conduct Research in Schools

The principal
Crestview Primary
35 Bethlem Street
South Hills
Johannesburg
2190
21 August 2019

Dear Sir/Madam

RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH IN SCHOOLS

My name is Audrey Arends. I am a DED student at the University of South Africa in the College of Education under the supervision of Professor Botha. The research I wish to conduct involves, the instructional leadership role of the Head of Department in South African primary school classrooms in enhancing the use of technology-based education.

The purpose of this study is through the instructional leadership role of the HoD within the primary school use ICT to enhance teaching and learning through the process of teacher training and access to ICT.

I am writing to request your permission to distribute questionnaires to the teachers who implement and integrate ICTs in teaching their subjects. The questionnaires will be handed out after school hours and each questionnaire will take 20 to 30 minutes. The information obtained will be kept in the strictest confidentiality and will be used for this research purpose only. I presume that the research findings will make a credible contribution to the teachers' adoption and integration of ICTs in teaching and learning.

If you require any further information, please contact me at audrey.a@live.com or 0727375884.

Yours sincerely
A.M. Arends

Appendix E: Letter of Consent - Teachers

Dear Participant

My name is Audrey Arends. I am a student at the University of South Africa in the College of Education under the supervision of Professor Botha. You are invited to participate in a research project entitled: **The instructional leadership role of the Head of Department in South African primary school classrooms in enhancing the use of technology-based education**

The purpose of this study is to determine ICT usage in teaching and learning and the factors that impede the full utilization of ICTs in South African urban schools.

The following questionnaire was developed to ask you a few questions regarding the instructional leadership role of the Head of Department in South African primary school classrooms in enhancing the use of technology-based education.

I hope that this study can elicit the reasons and the obstacles that prevent teachers from integrating ICTs in their teaching practices and make recommendations for ICT adoption for better teaching and learning. There are no identified risks from participating in this study.

This study involves completing a questionnaire. Neither your name nor any other identifying information will be associated with the questionnaire or the transcript. The participant's identity will be anonymous and what will be answered on the questionnaire will be kept in the strictest confidentiality. Your participation is voluntary, and you may withdraw from participating without any consequence. The questionnaire will take 20 to 30 minutes of your time to complete. There will be no compensation for participating in this study.

The report of the findings of this research study will be communicated to all the participants and I can be contacted at audrey.a@live.com or 0727375884. Thank you for your consideration. Your help is greatly appreciated.

Your signature on the reply slip indicates that you have read the above information, are an adult, and agree to participate in the study of, the instructional leadership role of the Head of Department in South African primary school classrooms in enhancing the use of technology-based education.

Yours Sincerely
A.M. Arends

Signature

Appendix F: Reply Slip

Dear Participant

The **Questionnaire** is for academic purposes, namely, to obtain a DED: Educational Management **at the University of South Africa, Pretoria.**

It is based on the project entitled: **The instructional leadership role of the Head of Department in South African primary school classrooms in enhancing the use of technology-based education**

The purpose of the questionnaire is to offer you an opportunity to raise the concerns you encountered in receiving training in ICT and/or Information Technology (IT). The questionnaire is a mere instrument to obtain information from the primary school teachers in J**ohannesburg, Gauteng Province.**

Your responses are confidential and will not be identified by your name and/or your primary school.

Complete this reply slip and return it by either using the enclosed envelope.

OR

E-mail it to me at audrey.a@live.com

OR

Telephone at 072 737 5884

RESEARCH REPLY SLIP

I am willing to be interviewed: Yes____No _____

I am interested in being in completing a questionnaire, but I would like to discuss the research project for some clarifications before engaging in the project: Yes_____No _____

My name is: _____

Telephone: _____

Address: _____

_____

If I do not hear from you, I will assume that you are not interested in participating in the study.

Your cooperation will be highly appreciated.

Appendix G: Questionnaire

SECTION A

Biographical Information

Gender: ☐ Male ☐ Female

Name of the school: _____

Qualifications: _____

Teaching experience: _____ years

Subjects taught: _____

Grade (s): _____

1. Head of Department roles

1.1. What is your role in leading the teaching and learning activities as Instructional leader?

1.2 How do you carry out your instructional leadership role within the school?

1.3 How do you share instructional leadership roles amongst the teachers?

1.4 What support did you receive from the district education office?

1.5 What kind of capacity building as an HoD did you receive from the district education offices?

1.6 What can of strategy model could the HoD implement with the school to improve the use of ICT in the school?

2. Teachers

2.1. How often do you have meetings with the HoD?

2.2. Does the HoD have the necessary leader skills to manage their department?

2.3. Does the HoD have any ICT skills to help teachers?

2.4. How can the HoD improve the use of ICT within the school and classrooms?

2.5.

3. Teachers and Head of Departments

1. Do you have an ICT laboratory/centre? Yes_____ No _____

If yes, how many computers are available in the ICT laboratory/centre?

2. What ICT tools are available at your school?

_____

3. Have you received any training on the integration and implementation of ICTs in your teaching activities? Yes_____No _____

Explain:

_____

4. How confident are you about your ability to use computers and other ICT instruments for teaching and learning?

Explain:

_____

5. Do you feel you have the necessary skills to integrate ICTs into your daily teaching responsibilities? Yes_____No _____

Explain:

_____

6. Do all teachers at your school integrate ICTs in their teaching activities? _____

If all teachers do not use ICTs for delivering their subjects, in which subjects are ICTs used for the facilitation of teaching and learning?

_____

7. Do you have all the necessary application software such as word processors, databases, etc required for the facilitation of teaching and learning? Yes_____No

Explain: _____

8. Do you use these ICT programs in teaching your subject to provide new ways of enhancing learners' experiences of acquiring knowledge? Yes_____No _____

Explain:

_____

9. Does the use of ICTs prove to be a better method of teaching learners as compared to the traditional methods of teaching? Yes_____No _____

Explain:

_____

10. Do learners learn better as a result of using ICTs in teaching your subject matter?

Yes _____ No _____

Explain:

_____

11. How do you use ICTs to cater to learners' learning needs?

_____

12. Do you use the computer and the internet to update your subject knowledge?

Yes_____NO _____

Explain:

_____

13. Do you have internet access? Yes_____No_____

Explain:

_____

14. Do you use the internet to update your professional development? Yes___No___

Explain:

_____

15. Do you give learners tasks that prompt the use of the internet? Yes____No _____

_____

For which subjects do you use the internet?

_____

16. Do you use email to post homework to your learners? Yes_____No _____

Explain:

_____

17. As digital age children, the majority of the learners in urban and rural areas do have smartphones. Do you allow them to use their smartphones for learning? Yes No____

Explain:

_____

18. Do you regard using ICTs as having any benefits? Yes____No ____

Give examples:

_____

19. Taking globalisation, the qualities required for the 21st century, the knowledge society, social and economic development into consideration, do you see your role as a teacher being the same as before?

_____

Why do you feel it is necessary to use ICTs in teaching today's generation (Y generation)?

Explain:

_____

20. The South African education policy states that "All South African learners must be ICT capable by 2025/2030. Do you share the same vision with the policymakers and the department of education?

_____

If the answer is yes, please explain:_____

If the answer is no, give reasons why:

_____

21. What challenges do you encounter in integrating ICTs in your responsibilities?

_____

22. What changes are needed for maximal use of ICT in teaching and learning?

_____

SECTION B

Head of Department and Teachers

The questions in this section pertain to ICT related training. Please answer the questions as honestly as possible.

8. Did you receive ICT training?

a) Yes ☐

b) No ☐

If your answer to question 8 is YES, answer Question 9

9. From which type of institution did you receive ICT training?

a) Officials from the DoE……..
b) Representatives from Non-Government Organisations (NGOS) ……
c) Educators from a Higher Education Institution……
d) Private training institutions …….
e) Other (please specify)
_____

What was the duration of the training for ICT?

a) One day to one week ……
b) One week to one month……
c) Up to a year ……
d) Two to four years ……
e) Other, specify _____

11. Did you receive any training concerning the teaching of ICT to learners?

a) Yes ☐

b) No ☐

If you answered YES to question 11, please answer question 12.

12. For which aspects of your teaching duties in ICT did the content and/or didactical training that you received, not cater?

_____

13 Would you like to receive more subject-related training for ICT?

a) Yes ☐

b) No ☐

14. In which areas of the content of ICT would you like to receive more training on?

_____

_

15. The following are expected problems that affect educators as teachers of ICT. Please show the one(s) that you encounter with an (x) and propose solutions to the problems.

a) Lack of sufficient subject related training for teachers in ICT …. ( )

Your solution: _____

b) Lack of sufficient didactical training for teachers in ICT .....( )

Your solution:

_____

c) Not enough computers for learners….....( )

Your solution:

_____

d) Lack of financial support to provide relevant facilities, such as computer lab and learning materials in ICT, etc .....( )

Your solution:

_____

e) Learners do not have computers at home to practice on..... ( )

Your solution:

_____

f) Overcrowded classrooms..... ( )
Your solution:

_____

g) Learners use the computer for entertainment instead of academic matters.....( )

Your solution: _____

h) Administrative problems, such as timetabling .....()

Your solution:

_____

I) Time constraints on the teachers' side.....()

Your solution:

_____

16. Are there any other problems that you met? Please specify and propose solutions to the problems.

THANK YOU FOR YOUR PARTICIPATION IN COMPLETING THIS QUESTIONNAIRE

Appendix H: Proof of Editing

EDITING SERVICES

To whom it may concern

This letter serves to confirm that editing and proofreading was done for:

AUDREY ARENDS

Education Management

University of South Africa

Doctoral Thesis

The Instructional Leadership Role of The Head of Department in South African Primary School Classrooms in Enhancing the Use of Technology-Based Education

Cilla Dowse
20 October 2021

Cilla Dowse PhD in Assessment and Quality Assurance in Education and Training: University of Pretoria 2014 Programme on Editing Principles and Practices: University of Pretoria 2009 Basic Editing and Proofreading: McGillivray Linnegar Associates 2008 Editing and proofreading for Academic Purposes: McGillivray Linnegar Associates 2021 Professional Editors' Guild Associate Member, DOW003	Rosedale Farm P.O. Box 48 Van Reenen Free State cilla.dowse@gmail.com Cell: 084 900 7837

Appendix I: Turnitin Report

 Digital Receipt This receipt acknowledges that Turnitin received your paper. Below you will find the receipt information regarding your submission.

The first page of your submissions is displayed below.

Submission author: Am Arends

Assignment title: Revision 3

Submission title: thesis

File name: Arends_Thesis_19.01.21.docxFINA…

File size: 628.95K

Page count: 190

Word count: 61,328

Character count: 348,621

Submission date: 19-Jan-2021 01:07AM (UTC+0200) Submission ID:

1489742692