

**PRINCIPAL LEADERSHIP AND THE INTEGRATION OF INFORMATION AND  
COMMUNICATION TECHNOLOGIES FOR TEACHING AND LEARNING IN  
ZIMBABWE**

**By**  
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## **DECLARATION**

I, Rosemary Guvhu, declare that the research thesis: **PRINCIPAL LEADERSHIP AND THE INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES FOR TEACHING AND LEARNING IN ZIMBABWE**, that I herewith submit for the degree qualification PhD in Education at the University of the Free State is my individual work which has not been previously submitted for a qualification at another university or college.

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## **DEDICATION**

The bulk of the credit for the successful completion of this PhD thesis goes to my spouse Farai Guvhu, who tirelessly exerted his efforts and love in full support of my research efforts, inspiring me to endure sleepless nights of inquiry, internet surfing, Google searching, reading, writing and revising my chapters. I dedicate the completion of my doctoral degree to my beloved children who rallied around me: Terence, Tawanda, Talent and Tafadzwa-Tracy.

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## **ABSTRACT**

This study aims to address the under-researched relationship between principal leadership and the successful implementation of ICT policy in Zimbabwean schools, by examining the roles that principals play and exploring the knowledge, perspectives and practices of school leaders on ICT integration.

The study utilises a theoretical framework, comprising the distributed, transformational and pedagogical leadership perspectives and a sequential, explanatory mixed methods design. A sample of 280 principals from 1679 public secondary schools was purposively selected. Preliminary questionnaires provided quantitative data from which descriptive statistics were derived. Deeper analysis using factor analysis, sampled t-tests and correlation techniques revealed significances and relationships. Open-ended focus group interviews and documentary analysis were then conducted with fifteen principals to provide qualitative data from which themes and categories were identified. By aggregating all of these results, a thick description of the situation was built up.

Four major findings were obtained. Firstly, school principals had limited knowledge of pedagogical integration of ICTs. Secondly, the majority of the principals' preferred pedagogical leadership compared to transformational or distributed leadership, due to the bureaucratic and hierarchical nature of schools in Zimbabwe. Thirdly, principals showed awareness of their roles in setting direction, developing staff, redesigning systems, managing the curriculum and creating a conducive learning culture, albeit with limited involvement of staff in decisions. Finally, principals' perspectives and understandings correlated with how they enacted their roles in support of ICT integration into classrooms. Overall, the study suggests the need for principals to be exemplary in embedding e-tools within schools.

In adding to our understanding of the leadership role of principals in ICT integration for pedagogy in Zimbabwe, this study may be useful to educational leaders and policymakers. In particular, it is hoped that this study will help stimulate the

development of a framework for school principals within which they can develop a shared vision, with teachers and students, for the effective instructional practices using ICTs. It is argued that this can be achieved by combining leadership approaches and promoting continuous professional development. The study suggests further lines of inquiry into linking principals' perspectives, practices and implementing ICT policies in schools.

**Keywords:** principal leadership, ICT integration, perspectives, principal, knowledge, ICTs

## **LIST OF AWARDS**

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## **ACRONYMS**

|         |  |
|---------|--|
| CAL     | Computer Aided Learning  |
| CIET    | Commission of Inquiry into Education and Training                |
| CPD     | Continuous Professional Development                              |
| DSI     | District Schools Inspector                                       |
| ECD     | Early Childhood Development                                      |
| FGI     | Focus Group Interviews   |
| ICTs    | Information and communication technologies                       |
| ITs     | Information technologies   |
| LMS     | Learning Management System                                       |
| MDGs    | Millennium Development Goals                                     |
| MoPSE   | Ministry of Primary and Secondary Education                      |
| PED     | Provincial Education Director                                    |
| SADC    | Southern African Development Communities                         |
| SANRAL  | South African National Roads Agency Limited                      |
| SDGs    | Sustainable Development Goals                                    |
| STEM    | Science, Technology, Engineering and Mathematics                 |
| UNESCO  | United Nations Educational, Scientific and Cultural Organisation |
| ZIMSTAT | Zimbabwe National Statistics Agency                              |

## **1. CHAPTER 1: ORIENTATION AND BACKGROUND TO THE STUDY**

### **1.1 Introduction**

In the context of 21<sup>st</sup> century education, information and communication technologies (ICTs) have been prioritised to empower educators and learners with the skills needed to confront the challenges of a changing world. ICTs encompass a wide range of services and applications using digital equipment and software, often running over telecommunication networks (Moore, 2016). It was envisaged that ICTs had the potential to significantly influence the Sustainable Development Goals (SDGs). Specifically, it aimed to reduce poverty (SDG 1) by providing universal primary education (SDG 2) and opportunities for teachers to provide vastly improved content, to transform their practices and pedagogical approaches to support school improvement and ultimately to boost student achievement. Haßler *et al.* (2016b) argue that advances in digital technologies over the decades have resulted in an increased interest in their potential for educational applications and specifically that low cost mobile technologies have sparked intense interest and experimentation with ICT in the classroom. Alenezi (2017a) and Presby (2017) view ICTs as classroom tools to promote teaching and learning and contend that digital devices provide seemingly endless opportunities to increase knowledge through information retrieval, manipulation, creation, presentation and network communication. Wei (2016) also stresses the critical role of information policy in resolving global challenges concerning the adoption of ICTs for instruction. This view has attracted the attention of many governments, persuading them to invest in ICT policy development in a bid to improve the inclusiveness, access, quantity and quality of services in various sectors of their economies, including education (Organisation of Economic Co-operation Development [OECD], (2015).

A large body of research shows that due to rapid technological and social developments over the last three decades, access to information and knowledge through ICTs is now virtually unlimited (Wastiau *et al.*, 2013) with access to vast information and knowledge hubs worldwide (Alenezi, 2017b; Bhat and Beri, 2017). However, a scholar such as Ramorola (2014) argues that this virtually unlimited access to information, prompted by the introduction of ICTs in education, has

created new contexts. Teachers who are also referred to as educators and principals or school heads are no longer the main source of information and knowledge and must transform their roles to help students access and process information independently and responsibly to develop broader life skills. Studies conducted by Jita (2016a), in South Africa found that e-Education in South Africa emphasised the importance of ICT literacy and demanded that every learner be ICT-savvy in this 21<sup>st</sup> century. Jita (2016a) further argued that despite this ICT vision, the policy did not specify how school leaders should meet this requirement, thus limiting its successful implementation .Haßler, Major and Hennessy (2016a) argue that the successful introduction of digital tools into education depends on having leadership and management of ICT guided by sound principles. The inception and advancement of technology implies a real shift in the educational improvement paradigm because institutional structures and culture are likely to have to change to meet the requirements of the digital era.

Despite its recognised benefits, the availability and utility of ICTs across Africa have remained limited in comparison to other parts of the world (Albugami and Ahmed 2015 Nikolopoulou and Gialamas, 2016). This has widened the gap between “developed countries” and “Africa”, limiting the capacity of developing nations to develop competitively and participate effectively in the global economy and the education sector (Kabanda, 2013:46).

Abdullah, De Witt and Alias (2013) agree that ICTs can transform leadership and management functions, improve teachers' instructional practices and contribute to better student achievement. The authors contend that the roles and responsibilities of principals should be changed to make ICT an enabler of successful pedagogical practices and student achievement. Clear associations between educational leadership and the quality of education using ICTs have been documented in developed nations such as Canada, the United Kingdom, Australia and the United States of America (Farrel and Isaacs, 2011). Work by Williams (2017) as well as Albugami and Ahmed (2015) indicate that transforming institutions to keep pace with the fast rate of technological advancement requires continuous professional development among school leaders. The need is to enable educational leaders to redesign their institutions and to restructure curricula and facilities to bridge the

technology gap in teaching and learning across schools. Li *et al.* (2015), Wei (2016), Bingimlas (2009) and Buabeng-Andoh (2015a) all pointed to the remarkable discrepancies and variations that exist from country to country, school to school and classroom to classroom in the way ICTs are used in education. Jita (2010) remarks that such variations in classroom practices might be attributed to among others, teachers' previous experiences, while other scholars attribute these variations to principal leadership perspectives and the way principals perceive ICTs and support the processes of incorporating ICTs in teaching and learning. Jita (2016b) finds significant variations in teachers' ICTs competences, which she attributes to uneven opportunities to learn, provided to pre-service teachers. Similarly, studies carried out by Jita and Mokhele (2012) reveal that the variations in the implementation of educational innovations can be attributed to teachers' prior knowledge, beliefs and background concerning the reforms. It therefore implies that there is a need to understand teachers' knowledge and beliefs in order to facilitate their successful implementation of school reforms such as teaching with and through ICTs.

Some teachers use ICTs to change classroom practices while the majority only use the tools to extend traditional instructional practices (Fabros-Tyler, 2014). Similarly, Gastelú, Kiss and Domínguez (2015) observe that the full capacity of ICTs has not been reached in many parts of the world even if their value has been recognised. The major challenge is for principals and teachers to embed ICTs into their pedagogy as per ICT policies for teaching and learning. Further analysis of previous studies shows that one factor that might explain some of these differences in schools might be the way in which principals perceive and execute their roles amidst a technological learning context (Ng, 2015). Similarly, the teachers' knowledge, perspectives and practices (Gudyanga, 2017) may influence the extent to which they apply new reforms in their respective schools. Other scholars found that school leaders were hindered in their autonomy to implement ICT reforms effectively because of hierarchical institutional structures and highly centralised authority (Alfelaij, 2016). Contrary to this view, Machado and Chung (2015) found that anomalies and variations in instructional practices with ICTs in education are highly correlated with school leaders' vision for, and understanding of, the functions of ICT incorporation into the classroom. Jita and Mokhele (2014) emphasise the need for

teacher leaders to promote the creation of teacher clusters for staff professional development for effective implementation of reforms.

A substantial body of literature identifies the principal as a key factor in influencing teaching practices and student achievement (Day and Sammons, 2013; Louis, Dretzke and Wahlstrom, 2014; Spillane *et al.*, 2015). Razzak (2013) and Warren (2016) assert that the availability of technology in schools is a clear determinant of ICT success. Alyami (2014) and Antoniou (2013) concur that teachers and principals' beliefs and perspectives in terms of how technology should be integrated into the classroom influence the extent to which technology use is optimised. The literature shows that teachers and leaders' knowledge and experiences with ICT as well as their attitudes towards its use in instructional practices can also influence how ICTs are embedded for the teaching and learning across the curriculum (Alenezi, 2017a). Wilson, Scalise and Gochyyev (2015) concur that the introduction of ICTs in education is acknowledged as a normative mandate for every institution but its practical application in the classroom relies on the understanding and acceptance of ICT policies and programmes by all teachers. According to Tsakeni (2014), the teachers' knowledge and skills, beliefs, perspectives and motivation mediated by school contextual factors influence the implementation of new reforms.

Kannan, Sharma and Abdulla (2012) and Makamure (2016) support the view that there is a need for skills to mentor pre-service teachers in teaching new subject areas, which means that their pedagogical, technological content knowledge and expertise are quite influential in promoting teachers' infusion of the tools into their lessons. Chai, Koh and Tsai (2013) and Chang (2012) have the same view, asserting that the reluctance of teachers and principals to adopt and use ICTs relates to their level of competence, knowledge, beliefs and perspectives concerning ICT use in the classroom. At the same time, ICT integration in schools should be viewed as a special case of managing change and should be driven by school leaders. In the same vein, Al-shahrani and Cairns (2016) found that technological changes require strong leadership to assist teachers in overcoming the different and numerous barriers related to the integration of ICTs into the classroom.

A close analysis of the literature on ICT integration into schools for the improvement of instructional practices and student outcomes, in developed and developing nations, shows that the major focus has been on teachers and their classroom practices (Alenezi, 2017b; Al Mofarreh and Ibrahim, 2016; Buaben-Andoh, 2015a). However, while the role of the principal in ICT integration processes would appear to be essential, there seems to be very little scholarship on the relationship between educational leadership and ICT integration in the teaching and learning of different subjects. Several studies across the world have explored the role of leadership in ICT use in schools but no known research has been conducted on public secondary schools in Zimbabwe (Chigona *et al.*, 2010; Shadreck, 2016). Similarly, Buabeng-Andoh (2015b) and Ottestad (2013) confirm that ICT leadership by principals is rarely considered when scholars and practitioners discuss the incomplete integration of ICTs in education. The literature does however reveal that when governments distribute resources for implementing ICT policies, which they prioritised, no specific ICT standards for learners, teachers and school leaders are provided for guidance (Almaliki, Ncube and Ali, 2014). This suggests that, in the absence of ICT standards for all, for each subject taught in public secondary schools, each school will determine its own way of integrating the tools pedagogically.

The Zimbabwean education system has a centralised structure whereby each public school in each district and province has the same access to government resources on a per capita grant for schools of the same size. For example, all public schools received free computers and ICT related accessories through the presidential computerisation and e-learning programme (Plan, 2014a Ministry of Information and Communication Technologies [MICT] Report, 2014). However, vast discrepancies and variations in ICT use exist between schools of similar sizes and contexts (Shadreck, 2016; Konyana and Konyana, 2013). Investigating the role of the principals' ICT integration in public secondary schools in Zimbabwe is therefore warranted. The major question is: What roles do principals play in the integration of ICTs for teaching and learning in their respective institutions? The question refers to their knowledge, perspectives and practices concerning the use of ICTs in schools.

The study intends to contribute knowledge to the scarce scholarship in this area, specifically from a Zimbabwean school leaders' perspective. The study, therefore,

will fill a gap in the current literature on Zimbabwe and contribute to the international context by examining the critical need in today's digital age for a type of principal leadership different from existing practices.

## **1.2 Background to the study: Research setting (The Republic of Zimbabwe)**

In Zimbabwe, the Ministry of Primary and Secondary Education prioritises information and communication technologies (ICTs) integration in schools. Alongside Zimbabwe's Millennium Development Goals (MDG) report of 2005, the National ICT policy (Zimbabwe Government, 2005b) recognised the potential of ICTs to contribute to the achievement of Vision 2020 to transform the country into a knowledge-based society. Kabanda (2013:39) asserts that ICTs influence all Sustainable Development Goals (SDGs) but "the fast track to achieve the SDGs lies greatly in the ability to effectively manage the diffusion and adoption of ICTs for development". It was envisaged that ICTs would transform service delivery, lead to more effective leadership and management and improve accountability within education systems. ICTs include a wide range of applications and technologies using different types of equipment, software and telecommunications networks (Goodwin, Low and Ng, 2015). The importance of ICTs for attaining high quality education was a key recommendation of the Commission of Inquiry (Nziramasanga, 1999) into education and training, Zimbabwe Government, 2002 *Science and Technology Policy* as well as the National ICT Policy (Zimbabwe Government, 2005b).

Kabanda (2013) comments that huge budgets were put aside to equip schools with the prerequisite infrastructure, hardware, software, in-service training for instructors, learning management systems (LMS) and school management systems (SMS) as well as broadband network access. New goals and practices on ICTs were intended to enrich the curriculum at all ages from early childhood up to tertiary level. The then President of the Republic of Zimbabwe, Mr R.G. Mugabe, at the official opening of the eighth Parliament of Zimbabwe on 17 September 2013 in the National Assembly in Harare asserted that:

There is need to transform the structure and curriculum of the country's education system to adequately meet the evolving national development aspirations. This

should see greater focus being placed in the teaching and learning of science, technology engineering and mathematics, including a prioritisation of youth empowerment and entrepreneurship development.

The school curriculum was revamped and tailored to prioritise the infusion of ICTs into teaching and learning across the curriculum, with a bias towards science, technology, engineering and mathematics (STEM) in order to achieve the country's SDGs and Vision 2020. The implementation of the updated curriculum with a bias towards STEM (Zimbabwe Government, 2015) was meant to align education with the needs of the economy and job market. The country needed to establish the ICT infrastructure to cope with technological advancement of the 21 first century in all its government sectors which included education (Zimbabwe Government, 2016). Estimates show Zimbabwe had a population of approximately 12.5 million in 2009 rising to above 13 million by 2012 (Zimbabwe Government, 2014b).

Farrel and Isaacs (2011), in a Country Survey Report, indicates that South Africa still confronts socio-economic and political challenges, hindering it from achieving effective implementation of the planned reforms such as the National ICT policy for education. Other scholars like Tella, Tella, Toyobo, Adike and Adeyinka (2015) commented that a great deal of knowledge about how ICTs are used is evident in developed nations contrary to developing countries. However, Tella *et al.* (2015) found a general gradual increase in ICTs use in Nigeria and most African countries but indicated that there was lack of information on how ICTs were being used by teachers in developing countries. These authors further confirmed that teachers lacked ICT expertise and technical support, hindering them from utilising the ICTs in their lessons. The Curriculum Review in Zimbabwe revealed that, "the education curriculum did not include ICT integration visions, hence, the level of digital literacy at grassroots level remained low to stimulate uptake and usage of ICTs within the public schools of Zimbabwe" (Plan, 2014b:15). Yet, the then President of Zimbabwe, Robert Mugabe, at the Education Conference and Expo in 2014 reiterated that:

Yes, we are some 90% up there in terms of literacy rate, but we have been saying to ourselves, it is not just literacy rate that we are aiming for but we would like to get the essence of what they call education at its highest level and for that, I am delighted to hear that there is teacher capacitation taking place in science and mathematics – the

areas that we most need and the areas that are relevant to the present times, present age. This is the age of technology, ICTs.

In spite of the noted gains in the use of ICTs, the literature reveals that the integration and utility of the technologies within schools is still limited and varied in most parts of the country (Gomba, 2016; World Bank, 2015). This is contrary to the mission of the Zimbabwean Government National ICT Policy, which aims to be equitable, valuable, inclusive, relevant and competence-driven. The aim is also for Infant, Junior, Secondary and Non-Formal Education to be anchored by the integration of ICTs in teaching and learning across the curriculum, including the 16 local languages (Zimbabwe Government, 2014b).

Ghamrawi (2013a) and Gomba (2016) attribute poor service delivery and the lack of ICT infusion into education to poor leadership in the public sector. The situation calls for immediate administrative transformation and resource mobilisation through, for example, the implementation of the Result Based Management System suggested by Gomba (2016). The updated Curriculum Framework designed in 2013 was meant to be implemented across all public sectors in the country, with a focus on improving the quality of performance in the utilisation of ICTs within schools. It is against this background that the Zimbabwean Government adopted a coherent national ICT policy framework in the belief that 21<sup>st</sup> century teaching and learning demanded a shift from traditional teacher-centred pedagogy to more learner-centred approaches. An ICT ecosystem for education was envisioned, not simply within education but incorporating other complementing and enabling domains such as the private sectors (OECD, 2015). However, the institutional capacity to deal with the complexities of infusing and implementing ICTs in schools was established through the Ministry of Primary and Secondary Education in the Zimbabwean context.

Contrary to that aspiration, few achievements were observed in the use and integration of ICTs in education. Shadreck (2016) conducted a case study in Harare Province on “*The role of ICT in the management of primary and secondary schools*”, finding that, despite huge investments in ICTs to improve education, such investments had not had a great impact in terms of ICTs integration into the actual processes of teaching and learning. Konyana and Konyana (2013), who carried out a

study on ICT use in Chipinge District of Zimbabwe, also remark that most schools have not fully embraced ICTs into the curriculum, with many ICT gadgets lying idle in storerooms. However, the same researchers note that other schools had successfully implemented the ICT policy for teaching and learning. Although some schools have successfully implemented ICT policies, Zimbabwe's use of ICTs is estimated to be approximately 20% to 30% of what it should be (Farrell & Isaacs, 2011), fuelling the argument that Zimbabwe is not uniformly e-ready for successful ICT integration into classrooms. The overall e-readiness score is said to be, "1:4 out of the expected 4:0", and Zimbabwe trails in the bottom ten regionally, while Botswana, Mauritius and South Africa are leading (Kabanda, 2013:46). Figure 1 depicts the position of Zimbabwe in terms of nominal Gross Domestic Product (GDP) per capita, as at 2012. The illustration indicates the country occupies a very low position in the ICT readiness compared to others such as Botswana, Mauritius and South Africa.

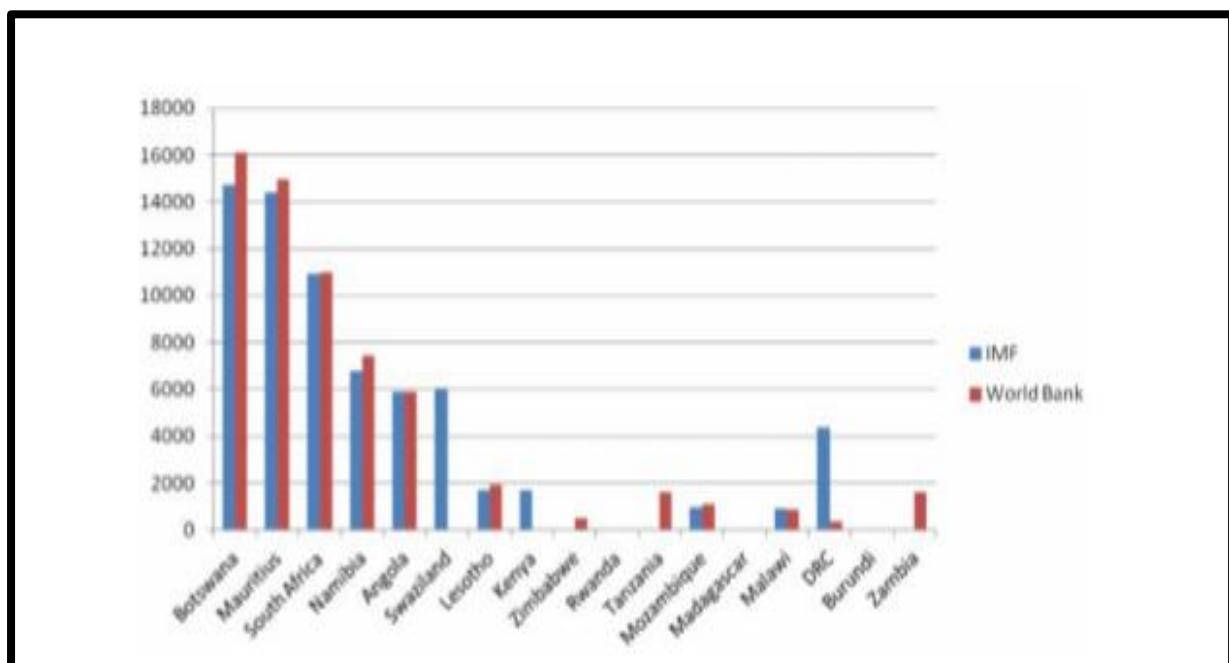


Figure 1: Nominal GDP (US\$) per capita of selected countries

Source: Kabanda (2013:46)

Although Zimbabwe lags behind other countries in terms of the GDP per capita as shown in Figure 1, Zimbabwe witnessed a gradual improvement in mobile phone density ranking during the period 2000–2010 for the Eastern and Southern African

nations. This was therefore likely to offer enhanced opportunities to promote the integration of the technologies in public sectors such as education. On the other hand, Konyana and Konyana (2013) note that whilst there has been significant roll out of communication infrastructure with 2G coverage exceeding 75% as at December 2015, high-speed broadband coverage remained patchy with most rural and remote areas not covered. Broadband coverage remains low in parts of the country and high in others, widening the digital divide and negating the principle of equity. Figure 2 shows that Zimbabwe is still at its infancy in terms of mobile density and use in the Southern African Development Community (SADC) region.

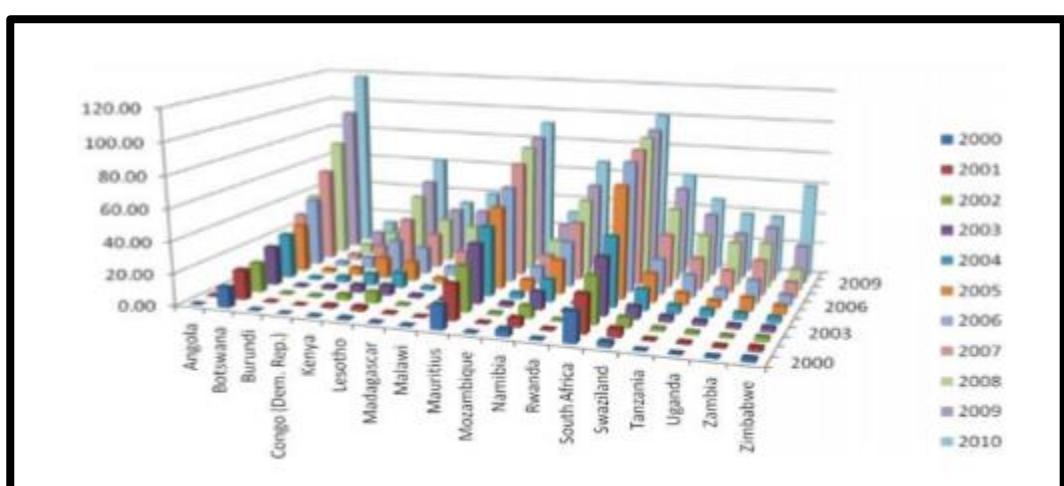


Figure 2: Mobile density in Eastern and Southern Africa 2000–2010

Source: Kabanda (2013:46)

The Zimbabwean ICT Policy Framework for 2012 reports that little progress has been made in the implementation of the ICT policy for education, since most schools are still using traditional teacher-centred approaches to instruction, without incorporating ICTs into their lessons to improve student achievement (Zimbabwe Government, 2014b). Similarly, Bukaliya and Mubika (2012) and Ndawi, Thomas and Nyaruwata (2013) note that despite huge investment and government support, Zimbabwe still lags behind in education, specifically regarding ICT integration into education.

As a deputy principal in Zimbabwean public secondary schools for four (4) years, I have observed discrepancies and variations in the use of ICTs by teachers and

principals, despite government efforts to offer support for the implementation of ICT policy. Researchers such as Schiller (2006) and Ottestad (2013) and Razzak (2015) explain the school-to-school variations in ICTs integration in terms of the differences in how principals perceive their ICT leadership roles. Others have argued that variations in ICT pedagogical practices are strongly dependent on principals' knowledge, beliefs and perspectives of the role of ICTs in education (Abdulla, De Witt and Allias, 2013; Moore, 2016). Research is needed, therefore, to precisely establish the role of school leadership in ICTs integration in schools.

Most studies on principal leadership and the use of ICTs have been carried out in developed countries (Day *et al.*, 2010; Leithwood *et al.*, 2010), which are ahead in trying to integrate ICTs in teaching and learning (Seyal, 2012). To date, the integration of ICTs in teaching and learning in developing countries with depressed economies such as Zimbabwe remains under-researched (Kabanda, 2015). Similarly, although previous studies have found that principal leadership is critical for the improvement of instructional practices and student achievement (Hallinger & Bridges, 2017; Hallinger, Lee and Szeto, 2013), we know very little about the leadership roles of principals in the integration of ICTs in teaching and learning in schools. A wider investigation into the role of principals in the integration of ICTs in education is therefore needed. The current study seeks to understand the role of principals in public secondary schools, specifically in Zimbabwe, regarding the integration of ICTs, such institutions constituting a majority and their principals the largest population of school heads in the country.

I also wish to address the technology divide by exploring the knowledge, perspectives and practices of secondary school principals towards integrating ICTs for teaching and learning in public secondary schools of Zimbabwe. The investigation sought to provide empirical evidence concerning what principals know, as well as the perspectives they have about their roles in integrating ICTs into teaching and learning (Harris and Jones, 2015). The exploration also examined the way school principals enact their leadership in support of ICT integration for teaching and learning across the public secondary school curriculum. The study makes recommendations to stakeholders in education for any gaps that might emerge in the investigation of the role of the principals in the integration of ICTs in schools.

### **1.3 Problem statement**

Zimbabwe's ICT national policy was introduced in public secondary schools and reviewed several times up to 2016. The policy for education is specifically aimed at integrating ICTs for teaching and learning across the school curriculum. However, local literature shows that more than a decade after the introduction of ICT reforms and with huge sums of money spent on staff training, hardware, software and suitable infrastructure (Konyana and Konyana, 2013), ICTs are yet to be integrated fully into all subjects of the school curriculum. Furthermore, stark school-to-school discrepancies and variations continue to exist (Kabanda, 2013, Shadreck, 2016). A survey by the Zimbabwe Government (2011) found schools in Zimbabwe were at their infancy in terms of implementing ICT policy guidelines with many teachers and principals lacking interest and motivation to embed ICTs in their teaching or in changing their pedagogical orientation, despite others having already realised remarkable improvements. The question remains why school leaders, using the same ICT policy and operating in similar socio-economic school contexts, implement ICTs so differently.

Several policy researchers and educational leaders have been trying to search for solutions to this problem. Haßler *et al.* (2016a) argue that teachers' prior values, attitudes, perspectives, experiences and practices significantly shape their responses to education programmes that involve ICTs. The differences in principals' knowledge, beliefs, perspectives and the way they enact their leadership practices in support of the use of ICTs in the teaching and learning may help to explain this (Day and Dragoni, 2015). However, what remains unclear from previous studies is the nature of knowledge, perspectives and leadership practices that school leaders possess in support of the use and integration of ICTs. This study investigated how the knowledge, perspectives and practices of school principals influence the integration of ICTs in schools across Zimbabwe.

There is a need to investigate the role of school leaders in the integration of ICTs for teaching and learning in schools in Zimbabwe because currently very little is known about why and how school leaders integrate the same ICT policy so differently in their schools (Ottestad, 2013; Msila; 2015). There is no systematic research to

inform policy makers why some institutions are failing to integrate ICTs into their curriculum as successfully as others do when the ICT policy is the same (Shadreck, 2016).

The National ICT Policy 2005, which was introduced in Zimbabwe and reviewed in 2012, 2014 and 2016, calls for the integration of ICT into education, focusing on improving pedagogic practices for quality education throughout the Zimbabwe school curriculum (Zimbabwe Government, 2015). However, from my four years' experience in school leadership, discrepancies and variations in the way ICTs are used persist in Zimbabwean schools. The implementation of the policy remains limited and is yet to be realised in most parts of the country. This is despite determined efforts by government to make computers and ICT-related resources available to Zimbabwean schools.

Exploring the knowledge, perspectives and practices of school leaders on the use and integration of ICTs in teaching and learning may identify missing links in the implementation of the ICT policy. This study therefore sought to explore the roles of principals in the integration of ICTs for teaching and learning in Zimbabwe and how these roles are enacted in practice. By investigating what these school leaders know, think and feel about ICT infusion in schools, this study hoped to improve knowledge and understanding of leadership roles of principals in the integration of ICTs for teaching and learning. The study should also be useful to anyone interested in ICT implementation in education, especially policy makers and educational leadership. It is hoped that this study would lead to the development of a framework that can be easily adopted by school principals to enable teachers and students who are also referred to as learners to teach and learn effectively using ICTs for quality education.

#### **1.4 Research questions**

The study was guided by the following main research question:

What roles do principals play in the integration of ICTs for teaching and learning of different subjects in Zimbabwe's public secondary schools and how are these roles enacted in practice?

In seeking to understand the roles of principals about ICT integration in schools, the following sub-questions were proposed:

1. What knowledge and perspectives do school principals have towards ICT integration in teaching and learning across the secondary school curriculum in Zimbabwe?
2. What practices characterise the enactment of principals' roles in support of the integration of ICTs for teaching and learning?
3. How do the principals enact their practices in support of the integration of ICTs in teaching and learning within the schools?
4. How can the principals' perspectives on and practices in support of ICT integration in Zimbabwean schools be explained and/or understood?

### **1.5 Aims and objectives of the study**

The study aimed to:

Explore the roles that principals play in the integration of ICTs for teaching and learning of different subjects in Zimbabwe's public secondary schools and how these roles are enacted in practice.

In a bid to understand the roles of principals regarding ICT integration in schools, the objectives were to:

1. Examine the knowledge and perspectives that school principals have towards ICT integration in teaching and learning across the secondary school curriculum in Zimbabwe.
2. Analyse the practices that characterise the enactment of principals' roles in support of the integration of ICTs for teaching and learning.
3. Establish the way principals enact their practices in support of the integration of ICTs in teaching and learning within the schools.
4. Understand how the principals' perspectives on and practices in support of ICT integration in Zimbabwean schools can be explained and/or understood.

## 1.6 Motivation and significance of the study

Many developing nations, Zimbabwe included, have realised that integrating ICTs for teaching and learning is quite a difficult task, despite government efforts to provide the required inputs to support ICT policy proposals. For instance, Gomba (2016), Shadreck (2016) and Kabanda (2015) agree that ICT related initiatives in the Zimbabwean education context lack scholarly inquiries to guide them. School leaders prefer to depend on official reports of patchy success in the integration of ICTs into education (World Bank, 2015; Kabanda, 2013). The dearth of inquiries that focus on principal leadership in ICT integration, particularly in developing nations such as Zimbabwe, is part of the motivation for the current study. Being relatively small, accessibility to all ten Zimbabwean provinces, shown in Figure 3, was feasible. I was also able, with relative ease, to contact school leaders to understand their knowledge, perspectives and practices better, in support of ICT integration.



Figure 3: Zimbabwe's ten provincial education centres

Source: (Ministry of Primary and Secondary Education, 2016:78).

This inquiry may be of interest to educational policy makers, researchers and other professionals who need to understand, plan, operationalise and promote the use of

ICTs in their organisations. For principals and teachers acting as change agents in ICT endeavours, a clearer picture would be presented of the enablers and barriers to ICT implementation in schools, which would assist in the successful integration of ICTs into classrooms.

As a developing country, Zimbabwe strives to transform its education system for a 21<sup>st</sup> century knowledge-based society. Its instructional practices, across the ten provinces, require sound and grounded research to guide decisions and approaches to the integration of ICT in the classroom to improve student outcomes. It is hoped that this study will contribute with significant implications for the attainment of educational goals. The results of the study may also help to inform other developing countries facing similar challenges to improve access, quality and equity of education through the implementation of ICTs in the classroom.

### **1.7 Theoretical framework**

Over the past 60 years, studies of distributed leadership, pedagogical leadership, transformational leadership, integrated leadership and democratic leadership have contributed to an understanding of school leadership and student outcomes (.Al-Mahdy, Emam and Hallinger, 2018). However, scholars persistently argue about the merits and demerits of adopting each of these approaches in framing exploration showing the link between principal leadership and student outcomes. Although Hallinger and Murphy (1995) contend that pedagogical leadership represents one of the key functions of school principals, others such as Day and Dragoni (2015) and Jo *et al.* (2015), agree that it is better to utilise a combination of approaches to study school leadership because there is no one-size-fits-all theoretical framework to guide leadership studies perfectly in various contexts. This study therefore, incorporated three different theoretical perspectives namely: distributed, pedagogic and transformational leadership to examine the leadership roles and practices of principals that influence the ICT integration process and affect the level at which ICT integration is implemented and supported (Day and Sammons, 2013; Farrel and Isaac, 2011; Bukaliya and Mubika, 2012) in public schools of Zimbabwe. The study specifically examined the applicability of these different perspectives for ICT integration into pedagogy. The major aim was to establish how these leadership

models are likely to influence the leadership practices of school principals in support of the integration of ICT within their schools. Harris *et al.* (2014) conclude in their studies on “Leadership, perceptions and technological integration” that the contingent features of school leadership must be clearly incorporated into theoretical models and that leadership should be conceptualised as a mutual influence process rather than as a one-way process in which school leaders influence others to integrate ICTs into instruction. Several scholars, (Hallinger, Heck and Murphy, 2014; Leithwood *et al.*, 2010; Al-Mahdy *et al.*, 2018), view strong leadership as a framing factor of greater significance in ICTs use in education than funding or equipment levels. Similarly, Harris *et al.* (2014), Ottestad (2013) and Day and Sammons (2013) support the need for an integrative model of educational leadership linking principal leadership to the ICT integration needs of the school contexts. Figure 4 shows the use of different theories of leadership, which included the distributed, pedagogical and transformational leadership perspectives for ICT integration that was used in the present study. The illustration shows the complementary role played by each of the three theoretical perspectives on leadership for ICT integration.

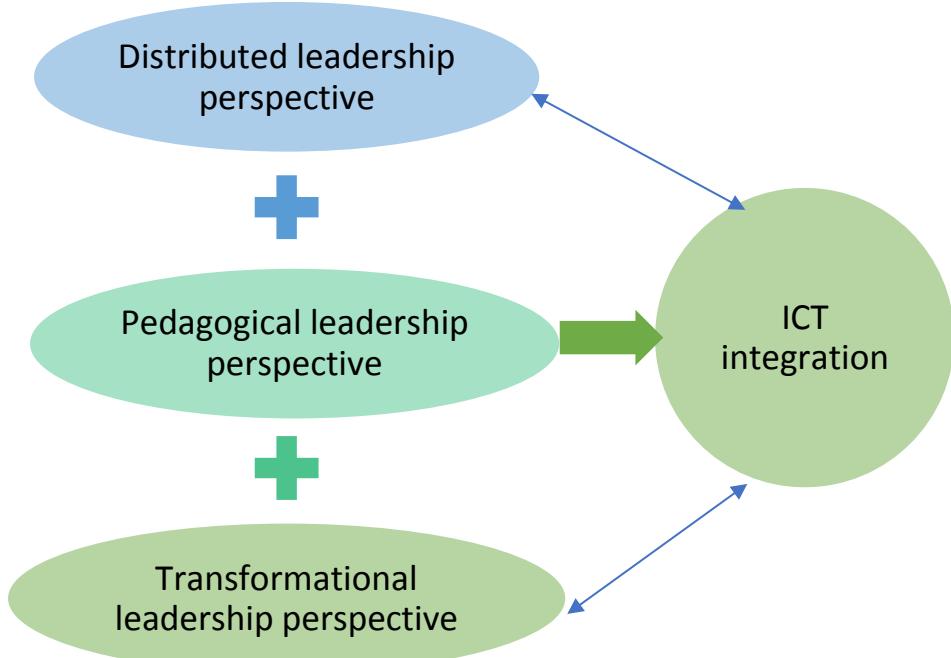


Figure 4: Proposed theoretical framework for ICTs leadership

Source: Adapted from Day and Sammons (2013)

It is important to note that the three different leadership perspectives guiding the study are not mutually exclusive, but each one is widely acknowledged as an

effective model for researching school principals as ICT leaders (Day *et al.*, 2014; Ottestad, 2013). The perspectives are based on studies of school improvement that point to the significance of leadership in ICT integration (Spillane *et al.*, 2015). The different perspectives are used throughout the analysis and interpretation of data in the present study and are briefly discussed in the coming sections.

### **1.7.1 Distributed leadership**

A clear understanding of the distributed perspective in the present study is based on the distributed leadership studies by scholars who include Spillane, Halverson and Diamond (2004), Spillane, Diamond and Jita (2003) and Printy (2014). They recognise that leadership perspectives are critical in implementing reforms in schools. The concept of distributed perspective is best comprehended as a practice widely distributed among principal leaders, followers and their situations (Spillane *et al.*, 2004; Spillane and Healey, 2010). The model is hinged on the practice of leadership and not necessarily who executes the responsibility for leadership roles or routines. Taking a distributed perspective encompasses two aspects, which are the *leader-plus* and the *practice* aspect (Spillane *et al.*, 2003; Spillane *et al.*, 2004). The *leader-plus* concept acknowledges that managing and leading institutions involve multiple individuals who include other key members in formally designated posts such as assistant principals, teacher mentors, subject specialists or technical experts, in addition to principals. Harris *et al.* (2014) assert that an exclusive focus on school principals only is simply limiting since other formally designated school leaders play pivotal roles in managing and leading implementation of schools reforms. It was therefore anticipated that, taking a distributed perspective together with other perspectives such as pedagogical and transformational leadership in implementing the ICT policy in Zimbabwean schools would allow the teachers without formal leadership positions to be responsible for collectively and collaboratively implementing ICT policies.

The rationale behind utilising this theory is to enable all staff members to complement each other's efforts and expertise in leading the ICT integration process within classes without necessarily assuming that all the members should be leaders. On the other hand, the *practice* aspect foregrounds the practice of leading ICT

integration enabling expert teachers to complement collaboratively, the roles of principals without solely relying on individual leaders because actions of principals alone are viewed as inadequate (Liljenberg, 2015; Spillane and Orlina, 2005). The practice of leadership is seen as central while principal leadership roles, functions and school structures are also valued. Practice is therefore framed through interaction of multiple individuals who include school principals, subordinates and their different situations to effectively integrate ICTs within the schools. In the present study, taking a distributed perspective implied that all staff members, whether principals, assistant principals, teacher mentors, ICT technical experts or heads of departments would be able to operate in and out of the school administration executing leadership functions as determined by the nature of work, need or school context. Thus, framing ICT leadership from a distributed perspective foregrounds the formal and informal aspects of the school and relationships within the system without discarding school principals' designation. The major issue is uncovering how leadership practice should be distributed among leaders in support of ICT infusion into lessons. Spillane and Orlina (2005) suggest the use of collaborated distribution where leadership is stretched over the work of two or more leaders in place and time especially when coaching novice teachers in implementing new reforms. Collective distribution where leadership practice is stretched over two or more leaders executing leadership activities separately but interpedently is also suggested (Spillane *et al.*, 2003)

On the other hand; Spillane *et al.* (2004) propose the use of coordinated distribution whereby leadership routines have more than two activities which should be performed sequentially by means of co-performance and interdependency. Principals enact their roles as leaders of leaders, with the responsibility of building a positive school culture premised on trust and mutual learning (Spillane *et al.*, 2015). Such a culture would promote the distribution of leadership roles and responsibilities for ICT use. This view is likely to be useful in guiding the current study into how school leaders and teachers, among other stakeholders, can effectively pool their expertise to promote the practice of teaching with and through ICTs.

### **1.7.2 Transformational leadership**

Transformational leadership offers a valuable perspective from which to investigate the change processes involved in ICT reforms (Leithwood, Patten and Jantzi, 2010; Day *et al.*, 2010). Other scholars such as Geldard, Boroumand and Mohammadi (2014) view transformational leadership as composed of four unique but interconnected behavioural elements that include inspirational motivation, intellectual stimulation, idealised influence and individualised consideration. The literature shows that principals who demonstrate transformational leadership are able to realign teacher values, beliefs and perspectives towards developing excellent ICT pedagogical practices (Leithwood *et al.*, 2010). According to Ng (2015), transformational leadership is based on charisma and the authority of the leader that inspires the educators to work beyond expected standards and excel at meeting the institutional targets. Applying the transformational leadership perspective to complement pedagogical and distributed leadership was deemed necessary due to the complementary role that each of these leadership theories play in analysing and understanding principal leadership and student performance within schools. The different theoretical perspectives enabled me to maximise on the merits of each leadership style and cater for the weaknesses of each of these different models with regard to their application by school leadership in ICT integration into instruction.

### **1.7.3 Pedagogical leadership**

To integrate ICTs in education successfully, proponents of the pedagogical leadership perspective (Hallinger and Murphy, 1985) stress the need for principals to be actively involved in supervision, observation, counselling and professional development in order to improve pedagogical practices and student achievement (Hallinger *et al.*, 2014). Mishra and Koehler (2006) as well as Voogt *et al.* (2013) find that this perspective can be utilised effectively to enhance teachers' technological pedagogical content knowledge (TPCK). School leaders can apply the model in setting the vision, direction or goals for effective instructional and evaluation practice by teachers using ICTs. Principals' ICT knowledge and skills are critical under this perspective in ensuring that the integration of ICTs proceeds in the correct direction

to effectively and efficiently create the desired change (Msila, 2015). Hence, the perspective is significant in this study given that principals are assumed to meet the Zimbabwean Ministry of Primary and Secondary Education's demands to be computer literate and competent. Harris and Jones (2015a) and Evans (2014) report the effect of pedagogical leadership on teachers' instructional practices is nearly four times that of transformational or distributed leadership. It is important to note that these three leadership perspectives were used throughout the study in all the analysis procedures.

## **1.8 Research methodology and research design**

The study was based on the paradigm of pragmatism, which privileges "what works" in a research context, emphasising the problem being investigated (Creswell, 2014a; Fetters, Curry and Creswell, 2013). Taking a pragmatic paradigm permitted me to use all approaches available to understand and explore the research problem (Subedi, 2016; Terrell, 2011). I used a sequential explanatory mixed methods approach for this study, applying quantitative-qualitative (QUAN-qual) procedures, starting with a quantitative enquiry followed by qualitative research, to collect, analyse, interpret and present data, then integrating the findings (Creswell, 2014b). The purpose of this approach was to build on the strengths of each method, offsetting limitations, to provide a fuller and clearer understanding of the research problem (Cameron, 2011; Gay and Mills, 2015). Firstly, I conducted a quantitative survey among 280 principals, followed by a qualitative second stage building on the first. The method provided a wealth of data, which I needed to answer the critical research questions in this study. The results of the first stage informed the nature of informants to be purposefully sampled and the types of questions asked in the second stage, enabling triangulation and cross checking of the data sources (Saunders, Kitzinger and Kitzinger, 2015).

## **1.9 Sample and sampling**

The target population for the quantitative inquiry comprised all 1679 principals of public secondary schools in Zimbabwe in the period 2010 to 2016. The formula by Krejcie and Morgan (1970) was initially proposed to estimate the sample size of 280 principals needed to be representative for this inquiry. However, later on, I considered the need for obtaining information rich sites by utilising purposive sampling procedures as recommended by Kumar (2014). For this study, information rich sites entailed schools where there was electricity and some ICTs for use ranging from the period 2010 to 2016. This was meant to get suitable data from principals who had some experiences with ICT use within their schools. I therefore, personally distributed the questionnaires to 280 principals to account for non-response and utilised the non-probability sampling procedures.

## **1.10 Data collection and analysis procedures**

The purposive sampling technique that I employed was useful to ensure that principals who had the needed information could be sampled. In terms of data analysis, the design was labour and cost intensive but all cases were followed up, including extreme cases or outliers, to ensure valid and reliable results (Leedy and Omrod, 2013). I grouped respondents according to the quantitative results to guide the qualitative research. I integrated all the data collection instruments and data sets to answer question 4. The response to the survey questions were provided on a 5-point Likert scale. Data collection instruments for the qualitative phase included audio-recorded structured interviews. Documents related to ICT implementation formed one of the most critical sources of data analysis for the study. I purposively selected three open-ended focus group interviews of five principals each (fifteen principals) to gather further data, which was thematically analysed to understand the enactment of leadership practices by the principals in support of the integration of ICTs (Archibald, 2016; Denzin and Lincoln, 2011). This was meant to obtain a clear view of school leaders' perspectives and practices regarding ICT integration (Li *et al.*, 2015). I purposively sampled informants from the same sample used in the quantitative stage aiming to get information rich sites for the qualitative

stage to explore quantitative results in more depth (Hall, 2012; Klenke, 2016). Records from the Zimbabwe Central Statistical Office on ICT use survey within the country (ZIMSTAT, 2014) were consulted to identify schools that were exposed to ICT use. This was essential because challenges were encountered in the pilot study whose results indicated that most rural public secondary schools lacked ICTs, electricity and had not yet been exposed to the use of ICTs. This was why I had to include all public secondary schools in my sample to get suitable data. Hence, the sample was drawn from public secondary schools instead of being restricted to solely rural schools.

Data analysis for the quantitative stage was done using the Statistical Package for the Social Sciences (SPSS version 23), as recommended by Pallant (2013). I summarised the quantitative results and presented them using descriptive statistics, such as the mean, mode, standard deviation, frequencies and percentages. Factor analysis was useful in identifying key themes, after which, Pearson's correlation coefficient and paired sample t-tests were crucial in inferring and analysing possible relationships (Field, 2013; Feilzer, 2010). It is important to note that data analysis was done separately at each of the two stages, with the "mixing" at the interpretation stage. This followed the form of reporting quantitative, first stage results followed by the qualitative, second stage results (McMillan and Schumacher, 2010). A third form of interpretation was used, showing how the qualitative findings provided clarification of the quantitative results without merging the two data sets (Cooper and Hall, 2016). Between content analysis and thematic analysis techniques, I opted to analyse qualitative data thematically by firstly familiarising myself with data that I transcribed, read and re-read, writing down initial ideas. I then coded important features in the data systematically across the entire data set, collating data relevant to each code and generated initial codes. To search for main themes, I collated codes into potential themes by collecting data that was suitable to each theme. This was followed by a critical review of the themes, which I checked to ascertain their links with coded extracts and all the data sets to obtain what Braun and Clarke (2006) termed a thematic map. After defining and naming the themes, I finally produced the research report, which indicated the story line in the study. Hence, data was presented and reported in thematic form using quoted responses from participants.

The results were also presented chronologically in diagrams, statistical tables and figures for clarity of research evidence (Buckley, 2015; Tracy, 2012).

### **1.11 Ethical issues**

As stipulated by the British Educational Research Association (BERA) (2011), I requested ethical clearance from the University of the Free State ethics committee and clearance was granted (Appendix 1). I then sought permission from the Ministry of Primary and Secondary Education (Appendix 3) and the school principals (Appendix 5). I assured participants of privacy and the confidentiality of the data that they provided. I also sought permission to audio record the interviews from participants, who each received an informed consent, sheet to sign, clearly stating that their participation in the study was voluntary and that they were free to withdraw from participation if they wished to do so, without prejudice. I used pseudonyms such as P1 for principals and S1 for schools (Table 11) in place of the real names of participants and schools, while number-identifiers were used in the three open-ended focus group interviews. Thus, I maintained research ethics by not disclosing informants' individual information. On the same note, I ensured trustworthiness in this research by considering key issues that included dependability, transferability and credibility of the study results (Gay and Mills, 2015).

### **1.12 Delimitations of the study**

The study sampled substantive school principals who were already in the post during the period 2010 to 2016. The research was limited to public secondary schools selected from ten provinces of Zimbabwe. I used various research instruments such as survey questionnaires (Appendix A), documentary evidence (Appendix B) and three by five open-ended focus group interviews (Appendix C) to corroborate data and avoid bias. The use of video records was also done to provide a clear understanding of the role played by principals in the integration of ICTs in the teaching and learning of different subjects across the school curriculum. The study did not include deputy principals, independent or primary schools.

### **1.13 Limitations of the study**

Firstly, the study was limited to school principals' role in the integration of ICTs for teaching and learning in public secondary schools in Zimbabwe. Other variables that have not been covered in this study include teachers, students and other stakeholders in ICT implementation. The results of the study could be generalised to all principals in similar contexts. Independent and primary schools were not included in this study but could be subject to further inquiry. Secondly, given that the study covered selected public secondary schools from Zimbabwe's ten provinces, the findings may only be generalised to similar public secondary schools. However, multiple data sources were used to ensure that results were valid and useful to the research context. Thirdly, since educational research is value-laden, this study cannot be entirely free from biases or subjective stand points, especially with regard to the researcher's status as a principal in a public secondary school setting. I could unwittingly and through personal prejudice, introduce bias into the data and its analysis, which might skew the interpretations. To guard against bias, I utilised various data sources and verified responses during the data analysis and interpretation stages in the quantitative and qualitative research (Bryman a Bell, 2015). Fourthly, there was no guarantee that participants in the study would be entirely honest in their reflections and reports. To obtain quality results, I used multiple data sources and analysis techniques as recommended by Bryman (2015). Even though there are such limitations, it is crucial to realise that this inquiry appears to be the first study analysing the role of principals in the integration of ICTs into public secondary schools in Zimbabwe. Finally, although some scholars argue that the use of a multi-dimensional approach requires time for results to be validated and ensured, the adopted theoretical framework allowed the merits of each of the leadership perspectives to be exploited and catered for the weaknesses of each. The theoretical framework involved three different theoretical perspectives namely, distributed leadership, transformational leadership and pedagogical leadership.

## **1.14 Definition of key terms**

**Leadership** refers to a social process involving complex relationship webs with multiple and evolving influences, with the intent of influencing followers to move in a desired direction (Abdullah *et al.*, 2013). This implies that leadership involves action that influences, guides and directs efforts of subordinates in instructional innovations, which are meant to achieve common institutional goals in schools (Day and Sammons, 2013).

**Principal leadership** refers to the identification, acquisition, allocation, coordination and use of the human-social and material resources to establish the conditions for the possibility of instructional innovation (Louis *et al.*, 2014; Harris *et al.*, 2014).

**School principals** are instructional leaders and managers in leading and managing curricular instruction within the school (Day *et al.*, 2014). These are commonly called principal leaders or school heads responsible for influencing the teaching and learning efforts in schools for school improvement and student achievement.

**Information and communication technologies** are the digital tools such as computers, the internet, televisions, phones and other enterprise software, middleware, audio-visual systems and storages that can be used for retrieving, storing, transmitting and manipulating data (Almaliki *et al.*, 2014).

**Integration:** a “generic principle guiding the curriculum to foster meaningful linkages between learning areas and subjects that the curriculum offers”, teaching with and learning through ICTs (Zimbabwe Government, 2016:15, Ministry of Primary and Secondary Education, 2016).

**Knowledge:** an awareness of the truths, information or principles based on empirical evidence (Afshari *et al.*, 2012b; Bangert and Alshahri, 2016).

**Perspectives:** one’s own way of viewing certain concepts revealing his or her own opinions, perceptions and beliefs or worldviews, especially in respect of leadership style (Machado and Chung, 2015)

**ICTs integration:** using ICT tools in teaching and learning with the involvement of teachers and students learning how to use ICTs; teaching using ICTs and students learning through ICTs (Alenezi, 2017b), meaning the use of technology resources in daily classroom practices and in management of school programmes.

**Teacher:** For the purposes of this study, a teacher is an educator, instructor or specialist in theory and practice of education, capable of helping others to acquire knowledge, competencies or values.

**Student:** refers to a learner, formerly engaged in learning especially one enrolled at a school or college. The study uses the concept student interchangeably with learner within a school system not college.

### **1.15 Layout of chapters**

**Chapter 1** presented an orientation and background to the study, the problem statement, research questions and objectives. This was followed by the motivation and significance of the study along with its delimitation and limitations.

**Chapter 2** focused on a review of literature linked to the role of school leaders in ICT implementation in schools.

**Chapter 3** discussed the research design and methodology. The approaches, sampling and sampling designs to be used were explained, showing how data was analysed and presented.

**Chapter 4** focused on data presentation and analysis of research results.

Finally, **Chapter 5** discussed and summarised the research findings and drew conclusions before making recommendations based on the findings from the study.

## **1.16 Summary of the chapter**

The current chapter has discussed the need for debate and exploration of the role of principals in the integration of ICTs for teaching and learning in Zimbabwean schools in order to improve access and quality of education, bridging the technology divide between rural and urban schools in Zimbabwe. The study probed school leaders' knowledge, perspectives and practices in support of ICT integration in schools. This offered the opportunity for policy makers, researchers and educational leaders to target interventions such as funding for staff development to support principals' leadership in ICT integration. Few studies in Zimbabwe have focused on the knowledge, perspectives and practices of school leaders in terms of ICT integration for teaching and learning in public secondary schools (Konyana and Konyana, 2013). Moreover, studies reveal that research on principal leadership and ICT integration in teaching and learning in the local environment is quite limited (Farrel and Isaacs, 2011; Shadreck, 2016). Hence, the findings of this study would be beneficial for the development of continuous professional training programmes, which aim to support school leaders as advocates of ICT integration within schools.

This chapter also provided the background to the research problem and the purpose of the study. It described the theoretical underpinnings of the study before noting the limitations, delimitations and contextual definitions of the study. The following chapter focused on a review of the literature on principal leadership and the integration of ICTs for teaching and learning of different subjects.

## **2. CHAPTER 2: LITERATURE REVIEW**

### **2.1 Introduction**

Too often, the review of related literature is a necessary evil to be completed as fast as possible so that one can get on with the real research (Gay *et al.*, 2011:79).

The previous chapter provided the introduction, orientation and background to this study, which is aimed at investigating the roles that principals play in the integration of ICTs for teaching and learning of different subjects across the secondary school curriculum in Zimbabwe, and how these roles are enacted in practice. The main problem centred on examining the knowledge, perspectives and practices that principals have towards ICT integration. The issues of how school principals enact their leadership practices in support of the infusion of ICTs in the school curriculum would be examined. The study also addresses aspects of how principals' leadership perspectives on, and practices in support of, ICT integration can be understood or explained. This chapter begins by reviewing a wide range of existing local and international literature related to the study.

This literature, "review identifies findings from similar studies", positions the current study as part of an ongoing dialogue in the literature, provides a framework for comparing results across this and other studies, as well as justifies the purpose of this study (Creswell, 2014a: 48). The review also facilitates the identification of research gaps and provides conceptual, theoretical and methodological insights into the lenses and tools that might be useful. The chapter begins by introducing the theoretical and analytic frameworks underpinning the study. Thereafter, it followed a thematic approach to review the literature related to this study. Figure 5 outlines the key themes to be followed in reviewing literature in the study from the setting up to the summary of the entire study.

2.2The study setting: The Republic of Zimbabwe and its education system

### 2.3. Conceptualising principal leadership and ICT integration in the Zimbabwean

#### 2.4.Theoretical framework underpinning the study:

Distributed leadership

Transformational  
leadership

Pedagogical leadership

#### 2.5.Principals' knowledge and perspectives towards ICT integration

#### 2.6. School principals' practices in support of ICT integration

Principals' enactment of practices in support of ICT integration into schools

Understanding leadership perspectives and practices in support of ICT integration

#### 2.7.Gaps in research

#### 2.8.Summary of the chapter

Figure 5: The thematic review of related literature

## 2.2 The study setting: The Republic of Zimbabwe and the education system

The Republic of Zimbabwe is a land locked member nation of the Southern African Development Community (SADC) bordered by South Africa, Zambia, Malawi, Mozambique and Namibia. Figure 6 illustrates the location of Zimbabwe and its background characteristics.

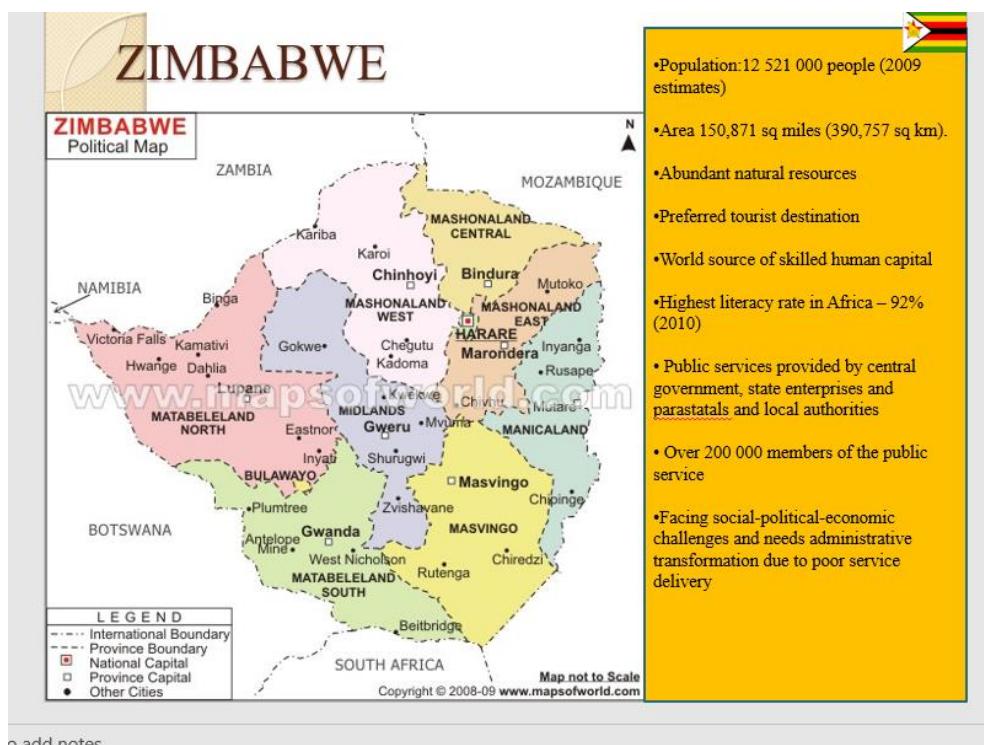


Figure 6: Zimbabwe, showing research context and background characteristics

Source: ZIMSTAT (2014)

According to World Bank (2015), Zimbabwe boasts abundant natural resources and skilled human capital, with over 200000 members of the public service. The Zimbabwe Statistical Survey of 2012 reveals that, at 92%, Zimbabwe had the highest literacy rate in Africa in 2010. The Zimbabwe National ICT Policy (2016:15) boldly aims to “achieve high quality ICT Leadership in Africa and ensuring that Zimbabwe’s ICT status is ranked in the top three among African nations using ICTs Development Index (IDI) by 2018 or to be number one in five years”. The policy did not mention

which strategies could be used to attain this vision but relies on leveraging Zimbabwe's good literacy rate. Contrary to this vision, and more than ten years after the introduction of the national ICT policy in 2005, limited use of ICTs is found in many parts of the country (Kabanda, 2015).

The country's socio-economic and political context has been briefly described in the first chapter. An insight into the education system in the Republic of Zimbabwe is essential in order to understand the context in which ICT integration processes are managed by school principals.

### **2.2.1 The education system in the Republic of Zimbabwe**

Information about the education system in Zimbabwe has been drawn from the Ministry of Primary and Secondary Education (MoPSE) Curriculum Framework for the period 2015–22. The country's education system is premised on a centralised system where policies are made by senior government officials then disseminated through bureaucratic structures down to school principals and teachers for implementation. A Provincial Education Director (PED) administers the ten provinces and their respective towns/cities (Figure 6), while each district also has its own District Schools Inspector (DSI). There are 72 educational centres in the country, each administered by a DSI (Zimbabwe Government, 2016). The number of public secondary schools in the country is presented in Table 1.

Table 1: Number of public secondary schools by province

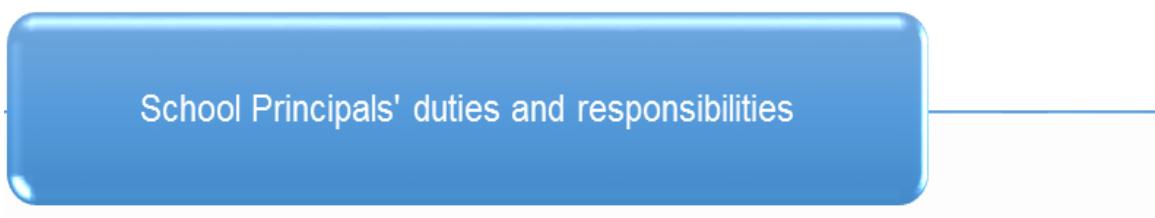
| Province           | Registered public secondary schools | Satellite secondary schools | Total       |
|--------------------|-------------------------------------|-----------------------------|-------------|
| Bulawayo           | 48                                  | 5                           | 53          |
| Harare             | 90                                  | 5                           | 95          |
| Manicaland         | 268                                 | 130                         | 398         |
| Mashonaland        | 126                                 | 97                          | 223         |
| Central            |                                     |                             |             |
| Mashonaland East   | 253                                 | 86                          | 339         |
| Mashonaland West   | 172                                 | 184                         | 356         |
| Masvingo           | 245                                 | 95                          | 340         |
| Matabeleland North | 115                                 | 65                          | 180         |
| Matabeleland South | 121                                 | 39                          | 160         |
| Midlands           | 241                                 | 97                          | 338         |
| <b>Total</b>       | <b>1679</b>                         | <b>803</b>                  | <b>2482</b> |

Source: Ministry of Primary and Secondary Education (EMIS Report, 2014)

The number of registered public secondary schools in the ten provinces is 1679 while unregistered (satellite) schools are 803, bringing the total to 2482. The figures show variations in the number of schools per province with the two largest cities, Harare and Bulawayo, having far fewer public secondary schools. Manicaland Province has the most schools, with 398 secondary schools. However, it is not apparent if these variations in the number of schools are likely to influence the level of ICT adoption and implementation by provinces. The Education Act of 1987, amended in 1991, 2006 and later, reveals that the education system in Zimbabwe is highly centralised with a hierarchical structure where authority is distributed in a pyramidal configuration, leading to a span of control.

The Minister of Primary and Secondary Education is the highest authority, followed by the Permanent Secretary who runs the administrative systems at Head Office and who disseminates policies to the Provincial Education Directors (PEDs). PEDs pass directives to the District Schools Inspectors (DSIs) who manage the schools within their mandate, communicating ministry policies to school principals who mediate

between school and district, reporting activities and progress to the DSI. The Ministry of Primary and Secondary Education (2013) emphasised that the curriculum framework was predicated on the capacity of the education sector in Zimbabwe, the challenge of implementing reforms through seven departments (PEDs, DSIs and their deputies), and the need for monitoring and evaluating the implementation of the reforms. The, Provincial Education Director's Policy Circular Number 1 (2017:2) stipulates the school principals' duties and responsibilities, as represented by bullets in Figure 7 below.



- Design and provide a relevant and suitable curriculum
- Management of financial and material resources
- Management of enrolment, transfer, suspension, exclusions and expulsion of students and control teacher establishment
- Control of teacher establishment
- Determination of school goals and objectives
- Examination administration
- Supervision and staff development of personnel
- Establish and maintain discipline and rapport among staff and pupils
- Public relations and communication with stakeholders
- Maintain the welfare of pupils and staff
- Interpretation and implementation of policy circulars
- Provision and development of co-curriculum activities
- Delegation of responsibilities to subordinates
- Plan, evaluate and report on school activities and programmes
- Submitting returns as and when required
- Discipline, tone and grievance handling
- Is a classroom practitioner
- Any other duties assigned by the Education Inspector, District Schools Inspector and Provincial Education Director

Figure 7: Duties and responsibilities of Zimbabwean public school principals

Source: Provincial Education Director's Policy Circular Number 1 of (2017:2) (N.B. All principals are assessed based on this job description).

According to the Zimbabwe Government (1987) Education Act, the determination of a school curriculum is part of educational policy formulation and no curriculum can be determined or implemented before thorough consideration by different levels in the Ministry of Primary and Secondary Education (Zimbabwe Education Act, amended 2013). For instance, the Education Act (1987:27; amended, 1991, 2006 and 2013), Section 56 states,

The Secretary shall determine the curriculum and examination system for all schools and in so doing, shall not determine different curricular and different examination system for different schools because they are government schools or non-government schools.

The Minister of Primary and Secondary Education is responsible for whatever happens in the education system of Zimbabwe, including the development and implementation of curriculum policy. The act further highlights that the secretary is the chair of the administrative committee comprising deputy secretaries, PEDs, DSIs and their deputies, and develops curricula through suitable departments of the ministry. Curriculum proposals are sent to the minister for approval before being disseminated to schools for implementation. Curriculum is defined as the sum of all learning experiences and opportunities provided to students in the context of formal and non-formal education. The Education Act 1987: 27 stipulates that:

Formal curriculum in any school shall be based on syllabuses devised by the Ministry for each grade or form and for each subject. Schools wishing to deviate from such syllabuses may do so only with permission from the secretary if it involves a major change in objectives.

Although the curriculum is determined above school levels, the policy accommodates local and international contexts as schools may suggest adjustments to suit local contexts but only with permission from the secretary. Therefore, as a matter of policy, the Ministry expects each school to “define its mission and specific objectives” as per the requirements of their institutional environments (Zimbabwe Government, 2017: 2-3). The determination of school goals and objectives is also stated as one of the key duties of the school principal in the Ministry of Primary and Secondary Education. All decisions start from the Permanent Secretary up to the learner (MoPSE, 2017). Therefore, school principals receive curriculum policies

prepared by senior officials from the Ministry of Primary and Secondary Education (MoPSE) and these policies are disseminated using top-down approaches. This implies that principals implement policies with limited autonomy to deviate. Hence, it is pertinent to review the literature on how Zimbabwe's ICT curriculum is organised to understand the context in which principals implemented the national ICT policy within their schools.

### **2.2.2 Organisation of the Zimbabwe school curriculum**

The literature reveals that the organisation of the school curriculum spans the years from Infant and Early Childhood Development (ECD) to secondary school level. The levels include Infant, Junior and Secondary school; the latter is composed of six years from Form 1 to 6. At the end of Form 4, students sit for the Ordinary Level examinations and write the Advanced level examinations at the end of Form 6 (Zimbabwe Government, 2015:21). The curriculum framework specifies the goals and objectives guiding schools during implementation processes, including the use and integration of ICTs for teaching and learning of different subjects across the curriculum (Ministry of Education, Sports, Arts and Culture, 2013). The nature of the school curriculum was said to be based on the mandate of the country to provide a wholesome education for all Zimbabweans focused on a shared vision:

To be the lead provider and facilitator of inclusive quality education for socio economic transformation by 2020 with a mission, to provide equitable, quality, inclusive and relevant infant, junior and secondary education (Ministry of Primary and Secondary Education, 2015:12).

Evidence indicates that several policy reviews were conducted to adapt and update the curriculum in order to achieve this vision. For instance, the Second Science Technology and Innovation Policy Draft (2002), stresses ICT literacy, calling upon all stakeholders to collaborate and ensure the implementation and monitoring of the new curriculum. The Education Technology Section, guided by the Commission of Inquiry into Education (CIET) (Nziramasanga, 1999:232), recommends embracing ICT in classrooms "to empower Zimbabweans for effective citizenry and employment for the 21<sup>st</sup> century" in what President Mugabe called "the age of technology, ICTs"

while addressing people at the second Zimbabwe Government Conference in 2015. The statement reveals that the nation had prioritised ICTs in education. It was against this background that the country endeavoured to develop an ICT policy to cater for the needs and aspirations of Zimbabweans.

### **2.2.3 The Zimbabwean ICT national policy and its implementation status**

A close analysis of the curriculum policy in Zimbabwe shows that the first ICT policy was introduced in 2005 following the recommendations of the CIET (Nziramasanga, 1999). However, studies in Chipinge, South East Zimbabwe indicate that progress in embracing ICTs has been problematic (Konyana and Konyana, 2013) with gadgets lying idle in storerooms rather than being utilised for teaching and learning. Government reviews also show that the country is not e-ready for integrating ICT into the curriculum (Zimbabwe Government, 2014b). The aims and ways of implementing the National ICT policy framework are summarised in Figure 8 below.



*Figure 88: Aims of the national ICT policy*

Source: Zimbabwe Government (2014a:14-31)

An analysis of the ICT policy framework suggests a reliance on leveraging the fact that Zimbabwe has the highest literacy rate in Africa, which rose from 92% in 2010 to 97% in 2011 [ZIMSTAT], 2014. It was anticipated that this high literacy rate offers the country the potential to be a knowledge-based society. The Government Reviews (Zimbabwe Government, 2014b) further indicate that the number of personnel with ICT qualifications is inadequate and the country lacks a standardised national ICT training certification. It was therefore deemed essential to widely expose workers, youth and children alike, to ICTs. However, it is unclear if the policy considered the capacity of the education sector to achieve these goals. The degree to which the nation can integrate and utilise ICTs is governed by its capacity to provide the needed services in a cost effective and sustainable way (Wastiau *et al.*, 2013). Kabanda (2013) surveyed the level of technological advancement across 18 Eastern and Southern African countries and found that in terms of mobile density compared to the nominal gross domestic product (GDP), Zimbabwe, Angola and the DRC were rated worst. This prompted the country to put in place the policy statements presented in Figure 8, which focused on leading and managing ICT initiatives, resource mobilisation, capacity building and networking to ensure effective implementation of the national ICT policy in education. These were regarded as key pillars to be embodied in the Zimbabwe Government (2014a) on the Curriculum Review Framework. The review of the education system and the ICT curriculum policy indicate that whilst there has been a significant roll out of communications infrastructure with 2G exceeding 75% by 31 December 2015 (Zimbabwe Government, 2015a), high speed broadband coverage is still patchy, with most marginalised areas lacking the internet connectivity necessary for the effective infusion of ICTs within schools. To worsen the situation, the ICT policy review identified a critical shortage of skilled workers needed to roll out ICT programmes (Bukaliya and Mubika, 2012) and incorporate ICTs into classrooms. Furthermore, most schools lacked reliable connectivity due to electricity challenges and high internet costs. For this reason, the ICT national policy disseminated in public secondary schools in Zimbabwe aimed to provide connectivity in all schools to bridge the urban-rural digital divide and to enhance teaching and learning using ICTs,

thereby promoting universal computer literacy in Zimbabwean schools (Zimbabwe Government, 2015b). On the other hand, the literature reveals that from the inception of the ICT national policy in 2005 up to 2016, the education curriculum excluded ICT integration strategies and guidelines that school principals could use to facilitate effective implementation of ICTs in the classroom. Gomba (2016) and King (2016) find that the level of digital literacy at grassroots level can be very low, especially in rural areas. Even the duties and responsibilities of school principals, as stated in the Provincial Education Director's Policy Circular Number 1 of 2017, does not refer to ICTs and the role of the principal in the integration of these tools into the curriculum. Thus, the question to be asked in the present study is, "What role do school principals have towards the integration of ICTs for teaching and learning in Zimbabwe?" Exploring the roles of school principals in the implementation of the ICT policy within schools might provide insights into the best practices that might be enacted by principals in support of ICT infusion into lessons. Another question pertinent in this context is, "What knowledge and perspectives do school principals have towards the integration of ICTs for teaching and learning of different subjects across the curriculum in the public secondary schools in Zimbabwe?"

Answers to this question might reveal information about principals' level of ICT knowledge and skills and the leadership approaches that they perceive as ideal to implement this policy effectively in order to improve student achievement.

### **2.3 Principal leadership and ICT integration within schools**

Research suggests that school leaders play a pivotal role, directly or indirectly, in school improvement and learner outcomes. Harris *et al.* (2014), examining top-performing educational systems in Asia through the lens of leadership and leadership development conclude that principal leadership remains the most significant driving force underpinning a school's sustained effectiveness and improvement. This matches Day and Sammons' (2013) finding that principal ICT leadership serves as a catalyst for unleashing the capacities that already exist in the school. Moreover, head teachers are second only to classroom teachers in their influence upon learners' outcomes. Thus, ICT leadership is clearly one of the key

elements in the successful integration of ICTs in schools. Harris *et al.* (2014) also emphasise the notion that the locus of leadership greatly affects the extent to which school reforms can succeed. On the other hand, a lack of ICT leadership capacity normally features in the failure of schools to embed ICT into the curriculum and mind-sets of teachers (Zhang, 2013; Williams, 2017). Therefore, it is important to review the issues of school leadership, referred to as principal leadership, but it is commonly confused with management.

### **2.3.1. ICT Leadership and management**

Research evidence indicates that the concepts of leadership, management and administration are often misconstrued, yet they seem to overlap (Printy, 2014). In their studies on “*Head teachers’ leadership for social justice and inclusion*”, Liasidou and Antoniou (2015) offer some distinctions between leadership and management. The first distinction is based on outcomes, where leadership outcomes are said to include vision, strategic plans, transformation, ends, people and the practice of doing the right thing. On the other hand, the management of ICTs involves elements of ICT policy implementation, operations, issues, transactions, means of doing activities and systems, which results in the infusion of ICTs into teaching and learning as guided by the ICT curriculum policy. It is in view of these tenets of ICT leadership and management that leading is defined as a process of providing vision, a clear consultatively defined common purpose, which facilitates the attainment of institutional goals responsive to diverse needs and situations. This definition is supported by Warren (2016) who studied, “the views of teachers as leaders without being administrators” concluding that head teachers provide clear vision and a sense of direction, prioritising and focusing the attention of staff on critical issues and reforms that influence school effectiveness and learner attainment, while avoiding being diverted or side-tracked. Day *et al.* (2010) argue that such school leaders are conscious of classroom practices and the strengths and weaknesses of their staff. Perhaps, this type of leadership can ensure that ICT innovations, processes and critical ICT curriculum reforms are implemented successfully.

Management, as perceived for example by Firmansyah, Christiananta and Ellitan (2014), is as a process of getting things right, by ensuring that management functions and operations within the system are carried out effectively and efficiently. The main tenets of management highlighted by these authors include ensuring that management practices across departments reflect leadership, as well as carrying out any useful restructuring so that the school becomes more effective and efficient. The collaborative design and implementation of strategic initiatives is also meant to meet accountability requirements, ensuring smooth operations guided by rules, regulations and policies for consistency. These alternative definitions of leadership and management reveal interwoven concepts that call for school ICT leaders' influence, facilitation and creativity to achieve ICT implementation collaboratively with subordinates, as identified by Totolo (2011) in neighbouring Botswana. The implementation of ICTs into education therefore requires leaders to be technological leaders and managers. This confirms the key role that principals should play in the application of digital tools within their schools. In studies of instructional leadership for the improvement of science and mathematics in South Africa, Jita (2010) confirms that the role of leadership in the improvement of teaching and learning has long been established but what remains unclear and somewhat contentious is what kinds of leadership matters most. According to Jita (2010), there has been a lack of sustained attention by researchers in exploring the link between leadership, instruction and learning.

Harris and Jones (2015) view leadership and management practices as activities tied to the core work of the organisation, designed or at least understood by organisational members, to influence their motivation, knowledge levels and practices. These views imply that ICT leadership is not solely about the position or function of an ICT leader, or any person who guides or directs a group that s/he manages and maintains in integrating ICTs within the classrooms, but in the school context. This includes ICT curriculum management and instruction as collective and collaborative endeavours carried out by multiple actors helping each other to integrate the technological tools within lessons (Moore, 2016). ICT leadership is also viewed as a social process involving complex relation-webs, multiple evolving influences and the intent to influence followers to move in a desired direction for incorporating the technological devices into education (Abdullah *et al.*, 2013:792).

Similarly, Louis *et al.* (2014) emphasise that leadership entails the ability of the leader, the followers, the situation and the perception and styles of leaders to cope with change implementation processes. The implication is that ICT reforms would require strong technological leadership capable of promoting successful integration of the technologies into teachers' instructional practices. Jita and Mokhele (2014) further argue that teacher-leaders can persuade, influence and coordinate staff in clusters with maximum energy to execute their duties and responsibilities at a high level of performance. This implies that the principal leadership perspective influences his or her effectiveness in implementing the ICT national policy and, ultimately, student attainment using ICTs in their classrooms. Evans (2014) remarked that without leadership, an institution may experience confusion and chaos but with effective leadership, there would-be progress. Ineffective leadership therefore causes a system to decline or decay. Principal leadership appears to have a positive link with quality education, with overwhelming evidence from the literature that ICT leadership makes a difference in infusing ICTs into education (Petko, Prasse and Cantieni, 2018 Razzak, 2015). However, there is limited research focused on how formal leadership from school principals influences teachers' integration of ICTs within their lessons to improve student achievement (Al Mofarreh and Ibrahim, 2016; Wei, 2016). Scholars have found that principals contribute greatly to student achievement whether directly or indirectly (Sun *et al.*, 2013) but few studies have been conducted on the link between principal leadership and the integration of technology into instruction within public secondary schools. Bektaş (2014) and Lindqvist (2015) stipulate that the responsibility for implementing the ICT policy to enhance student learning be placed on the school principals, who otherwise face being fired or are reassigned, and to a somewhat lesser extent, on teachers. Others contend that principal leadership perspectives, beliefs and competencies influence pedagogical practices (Day and Simmons, 2013). The current study regards the principal as a person who has controlling authority or is in a leading position, leading or guiding the school to better teaching and learning. Day and Dragoni (2015) view a principal as the prime instructional leader who works with leadership functions that are sometimes shared and delegated. Weber and Kauffman (2011) conceptualise the principal leader as a school leader, head teacher or technology leader who is a critical and pivotal person for establishing and maintaining learning contexts driven by technology or ICTs. Top leaders operating in formal leadership positions are

called principals or directors. Hallinger *et al.* (2013) regard a principal as a synonym for school leadership, where the term, principal is said to have originated from the term, principal leader based on the assumption that the school principal had more skills and knowledge than anyone else had and would guide others in how to teach and attain a shared vision. However, technology leadership is regarded as a new element of principal leadership and has become the subject of instructional reforms incorporating ICTs, particularly in developed nations such as the USA, Britain and Canada. Few studies in this area have been carried out in developing areas such as Africa (Day *et al.* 2013; Mwawasi, 2014).

Most studies tended to focus on teachers and students' activities in the classroom, without paying attention to the leadership required to adapt effectively to the ever-changing ICT environment (Leithwood, Harris and Hopkins, 2008; Salleh and Laxman, 2014:350) and in particular to deal with barriers to change (Afshari *et al.*, 2012b; Razzak, 2015). Louis *et al.* (2014) stress the pivotal role of principals in implementing new reforms. Yet, Petersen (2014) and Presby (2017) found few studies into the ICT leadership roles of principals, although Ng *et al.* (2015) and Razzak (2015) began filling that gap. Brown (2016) defines technology leadership as the study and ethical practice of facilitating and improving performance by creating, using and managing suitable technological processes and resources. Price (2014) perceives ICT leadership as a stronger predictor of technology outcomes when compared to either expenditure or infrastructure. Hence, one can infer from these statements that technology leadership is critical to ICT integration into education, because of the different roles that principals are expected to play for successful ICT reforms. This study would provide insights into principal leadership roles focusing on knowledge perspectives and practices as key independent variables affecting ICT infusion into the school curriculum. Although some studies have endeavoured to explore leadership matters in relation to ICTs in schools, none has been conducted within the Zimbabwean public secondary school context on a large scale. Therefore, the focus of this thesis is to fill the identified gap in the research.

### **2.3.2 Studies on ICTs integration in the school curriculum**

Williams (2017) argues that even if school principals are said to be key to the integration of ICTs into the school curriculum, without a solid understanding of the accurate definition of technology, technology integration and its components, support by principals for teachers may not be effective and may lack direction. Williams (2017) identifies the need for an appropriate conceptualisation of ICTs and ICT integration into the school curriculum. Howard, Chang and Caputi (2015) concur that teachers, students, parents and principals' leadership are all instrumental in facilitating ICT knowledge and skills; views confirmed by Wilson *et al.* (2015). ICTs can be categorised as "old" media such as radio and television and "new" media such as desktop and laptop computers, mobile phones (with or without internet) and other tools. The technology of the 1960s and 1970s has been replaced by information and communication technologies (ICTs), information technologies (ITs) or just technology (Alkrdem, 2015; UNESCO, 2015). ICT is an acronym for all technologies used for processing information and communication, specifically through the integration of computers with communication systems, including audio and video technologies such as multimedia or digital media.

Thus, ICT is an extended term for information technology (IT), which stresses the role of unified communications involving telephone lines, wireless signals, computers, software, middleware, storage and audio-visual systems, which enable users to access, store, transmit and manipulate information (Alenezi, 2017a). The term ICT is also said to imply the convergence of audio-visual and telephone networks through a single cabling or link system. This implies potentially huge economic cost savings due to the removal of telephone networks to link computers, using a single unified system of cabling, signal distribution and management (Alkrdern, 2015). However, ICT has no universal definition as the concepts, methods and applications involved in ICT are regularly evolving, sometimes almost daily (Razzak, 2015). ICT encompasses any product that stores or receives information electronically in a digital form, including personal computers, digital television, email and robots. ICT is such a broad concept that its influence on curriculum, pedagogy and student learning can only be examined from the perspective of a specific ICT application, hardware or software, applied to teaching and learning practices. Jita

(2016a) studied pre-service teachers' use of ICTs for pedagogy, finding that pre-service teachers require plenty of technological content knowledge to integrate ICTs into their lessons effectively. There seems to be a misconception among educators who perceive ICTs to mean the use of computers and computing related activities against the definition by Hilman (2015). According to Hilman (2015), ICTs are all technological tools and the process of accessing, retrieving, storing, organising, manipulating, producing, presenting and exchanging information. This is done by means of electronic and other automated means including hardware, software and telecommunications in the form of personal computers, scanners, digital cameras, phones, faxes, modems, CD and DVD players and recorders, digitised video, radio and television programmes, database and multimedia programmes. Prior studies show that the principals' knowledge and expertise in ICT concepts, methods and processes is crucial for its successful integration into the school curriculum (Howard *et al.*, 2015; Reju and Jita, 2018). It is against this background that a research question was framed for this study to examine the knowledge and perspectives that principals have towards ICT integration for teaching and learning of different subjects across the secondary school curriculum.

Different scholars and educators perceive the concept of ICT integration into education differently, resulting in variations being noted in the way these technological tools are embedded from country to country, from school to school and from classroom to classroom (Haßler, Major and Hennessy, 2016). The literature also points out that ICT integration into education is not synonymous with offering computers or providing ICT infrastructure and facilities for teachers and students. Razzak (2015) views ICT integration as the use of ICT in teaching and learning. However, Hatlevik, 2017 find that integrating ICT for teaching and learning encompasses three key elements: teachers and studentss learning how to use ICTs, teaching different subjects using ICTs and students learning through ICTs. The three elements imply that teachers and students may be using technology differently. The first reveals the mere use of ICTs without a direct link to education while the second refers to teachers integrating ICTs into pedagogy. The literature indicates that school leadership perspectives, beliefs, knowledge of ICTs and their use determine how ICTs are employed within schools. That is the reason Bangert and Alshahri (2016), in their comparative studies of the use of ICTs by faculty in Saudi Arabia and the

United States, focused on the integration of ICT into daily classroom practices and school management. The scholars believe that the integration process is achieved when the use of technology is done routinely, in a transparent way and when technology is readily available and accessible to everyone in the school, supporting the curricular goals and helping students to learn effectively and to reach 21<sup>st</sup> century goals (Alyami, 2014). A comprehensive ICT integration programme is one that includes the availability and accessibility of technology resources to everyone in the school, involving teachers and students learning how to use ICT, teaching with ICTs and students learning through ICT (Skryabin *et al.*, 2015).

This description of ICT integration reveals a number of variables, including the availability of ICT infrastructure, facilities, curriculum goals, access to resources and the utilisation of ICT in the classroom. Albugami (2016) proposes the development of a strategic approach to ICT implementation in Saudi Arabian secondary schools, based on the perception that the integration process is a complex concept that needs to be well understood by everyone in the teaching and learning process if ICT implementation is to be successful. It is believed that an accurate understanding of the term ICT can help facilitate the process of integration and ensure that it is applied appropriately to the school curriculum. In studies on "*Measuring school principals' support for ICT integration in Palermo, Italy*", Alenezi (2017a) reports that ICT integration can employ tools for teaching in terms of technical instruments, supporting student learning in general or certain subjects in particular. ICT integration encompasses teaching about electronic media and teaching subjects through the electronic media and (Alyami, 2014), for example, mathematics, commerce, technical subjects, science, history, English or using a TV, cassette recorder or CD/DVD player to teach foreign languages. Several studies agree that ICT integration is said to have occurred if ICTs have been embedded for teaching and learning of different subjects across the school curriculum, where the students and educators are fully engaged in the process and in line with ICT policies, school curriculum goals and objectives. Al harbi (2014) and Hilman (2015) argue that ICTs can only become a catalyst by offering tools that educators employ to enhance teaching, providing students with access to electronic media and clarifying abstract concepts. On the same note, Goodwin *et al.* (2015) stress the need to develop teacher leadership for successful implementation of school reforms. Ghamrawi

(2013b) and Haßler *et al.* (2015) also concur that not only the principal matters in school improvement but also teacher leadership architecture in schools can improve student achievement. Jita and Mokhele (2014) assert that when teachers cluster together teaching specific subjects, they are likely to improve the quality of education. Thus, integrating ICTs requires staff to work collaboratively in clusters sharing their knowledge and skills to research, organise, evaluate and communicate information, which entails the actual application of ICTs across the school curriculum.

There is empirical evidence that the integration of ICTs in the curriculum is complex and requires a practical implementation plan to achieve worthwhile outcomes (Alyami, 2014). This means that ICT implementation should not see as merely a matter of providing hardware and software but some attention has been given to the actual application of the digital technologies into the lessons for improvement of student performance. To understand the problems associated with the implementation of complex change better, for example, the infusion of ICTs into the school curriculum, some scholars such as Alenezi, 2017b propose the provision of adequate ICT infrastructure, leadership support, teacher professional development programmes and time for teachers to fully embed the technologies into their pedagogy. Otherwise, if the ICTs are not fully infused into the curriculum then, there will be a gap between the intended and implemented ICT curriculum policy as noted by Kabanda (2015) in some parts of Zimbabwean schools. The intended curriculum is viewed as planned or intended by policy makers, as written down in the curriculum policy documents, showing the ICT knowledge and skills expected, rationale and goals for learning through and with ICTs (UNESCO, 2015). The implemented curriculum refers to the way educators understand and translate the curriculum policy into educational practice. Finally, the attained curriculum describes the outcomes of the curriculum, how students experience the curriculum and what they really learn (OECD, 2015). Khalid and Nyvang (2014) clarify that curriculum representations offer useful frameworks for comprehending and studying the gap between the ICT curriculum policy and actual educational practices involving ICT integration. The OECD (2015) report proposes that policies regarding ICT integration include three roles for ICT in the curriculum: as an object of study (at the level of literacy), at the level of specialised courses (social rationale) and as an aspect of

education. The digital devices should be therefore, incorporated in the teaching and learning processes across the school curriculum to serve different purposes including gaining ICT application skills, social interactions and improving student performance among other benefits of ICT integration into education.

This study aimed to investigate the roles that school principals play in the integration of ICTs for teaching and learning across the secondary public school curriculum in Zimbabwe, based on a pedagogical rationale for ICT integration. The study aimed to answer the research question, "What roles do principals play in the integration of ICTs in the teaching and learning in Zimbabwe's secondary schools and how are these roles enacted within schools?" In this study, the school curriculum refers to the combination of subjects studied within a school year and subsequent years as a learner moves through the educational system. The government of Zimbabwe has extensively encouraged primary and secondary schools to implement usage and integration of ICTs across the school curriculum through the promulgation of a series of policies which schools were tasked to implement. For instance, the first one was introduced in 2005 (Zimbabwe National ICT Policy for Education (2005), followed by the National ICT Policy Framework (2014) as well as the Zimbabwe National ICT Policy (2014) and then, the National ICT Policy Framework (2016). The literature points to the significance of principal leadership in leading and managing ICT integration. School principals are placed in a strategic position to perform various critical roles in merging ICTs into instruction. Ottestad (2013) and Razzak (2015) concur that principal leadership matters in ICT integration and hence requires further attention by researchers. Al-shahrani and Cairns (2016), in a study into the management of change during e-Learning integration in higher education, suggest that the integration of ICTs into classrooms is critical for offering opportunities for students to learn and be functional in a technology era. They argue that traditional educational contexts do not appear relevant for preparing students to operate and be productive in the 21<sup>st</sup> century; they go on to speculate that institutions which resist the incorporation of new technologies will never survive but will become extinct. On the other hand, several studies found that ICTs do not improve the quality of education on its own (Razzak, 2013); however, what matters is the way ICTs are utilised to improve pedagogical processes, it being the duty of principal leaders to ensure effective implementation of ICT policy initiatives (Fabros-Tyler, 2014). The

foregoing review has shown that the international and local literature focused on Zimbabwe identify school leadership as pivotal for embedding ICTs in teaching and learning practices in the classroom (Razzak, 2015). Hence, conceptually, this study is guided by the perception that principal leadership is pivotal in the integration of ICTs for teaching and learning across the school curriculum. However, in order to integrate ICTs into schools, it is essential for educators, teachers and school leaders to collaborate, focusing on a shared ICT vision, strategic plans and based on leadership theories appropriate to the school context (Day *et al.*, 2010). The distributed, transformational and pedagogical leadership roles of principals are vital to the success of ICT initiatives, especially if used alongside each other by school leaders and teachers with highly developed ICT competencies in line with modern pedagogy (Day *et al.*, 2013; Al Mofarreh and Ibrahim, 2016). Therefore, the question to be asked is, “What knowledge and perspectives do school principals have towards ICT integration in the teaching and learning across the secondary school curriculum in Zimbabwe?”

#### **2.4. The theoretical framework underpinning the study**

A theoretical framework of principal leadership developed from the literature was used as a lens to guide this study. The study incorporated three different theoretical and analytic perspectives to examine the leadership roles of school principals in the integration of information and communication technologies (ICTs) for teaching and learning across the public secondary school curriculum in Zimbabwe. All three perspectives were utilised separately to analyse and interpret data showing the extent to which each of these theories influenced the principals' practices in their ICT integration efforts within schools. The inquiry drew upon the three main themes of principal leadership namely: distributed leadership (DL), transformational leadership (TL) and pedagogical/instructional leadership (PL/IL), which have been widely recognised by international studies as an ideal fit with perceptions of collective leadership which abound in the 21<sup>st</sup> century educational institutions (Day & Sammons, 2013:9). Harris *et al.* (2014), Seyal (2012) and Slater (2011) suggest that indicators of school leadership for ICTs include elements of distributed, transformational and pedagogical leadership. Furthermore, studies of school

improvement point to the significance of principal leadership in transforming schools while fostering self-directed learners capable of lifelong learning. Ottestad (2013:109) suggests that, “distinguishing these three theoretical perspectives on general school leadership can be effective in conceptualising a study”. The study therefore analysed the applicability of each of these three different perspectives to establish how the practices of school principals are enacted in support of the infusion of ICTs in the teaching and learning across the public secondary school curriculum in the ten provinces of Zimbabwe. It is important to note that the three leadership perspectives guiding this study are complementary considering that each one has its own strengths and weaknesses, each being acknowledged as an effective model for school principals as ICT leaders and each with its own strengths and limitations. Harris and Jones (2015a), who studied the transformation of education systems alongside comparative critical perspectives on school leadership, posit that the application of the concepts and mixing of these theories indicate a shift from principals as managers to principals as managers and leaders of leaders. Day *et al.*, (2014), in identifying leadership perspectives as critical for implementing changes and innovations in schools, also note that leadership has been suggested as a framing factor more significant than funding and infrastructure. Price (2014) specifies that technology is about change and change requires strong leadership that can help in overcoming the different and numerous changes that normally come along with implementing ICTs in schools. A closer analysis of these studies reveals that school leaders play a pivotal function in the implementation of school reforms in education, depending on the leadership theories that they employ. This study, therefore, examines the three different leadership perspectives in the context of ICT policy implementation within schools, not from teachers or learners’ perception, but from school principals’ points of view.

#### **2.4.1 Distributed leadership perspective**

Research evidence from scholars such as Spillane *et al.* (2015) and Tan and Ong (2011) show that the original concept of distributed leadership is usually viewed as influence derived from cognitive and social psychology, drawing from distributed cognition and activity theory (Harris *et al.*, 2014). Day and Sammons (2013), in a

study on “*successful leadership for school effectiveness and school improvement*”, conclude that a contemporary distributed approach to leadership implies that social environments and inter-relationships are critical. Spillane *et al.* (2004) and Spillane and Orlina (2005) argue that early developers of the distributed leadership concept, specifically clarified leadership perspectives in educational institutions, as a shift away from the structural and cultural hierarchical patterns of bureaucratic control. The perspective regards the aspects of practice and cognition as critical in implementing school reforms. Building on this, Sun, Xu and Shang (2014) and Day *et al.* (2010) refer to a network pattern of control in which workers are involved, actively participate in making school decisions and where staff cooperation, collectiveness, collegiality and coordination support the implementation of school policies and programmes.

The literature suggests that the theory of cognition is better comprehended as a distributed phenomenon across formal and informal leaders, both internal and external to institutions. This is premised on the view that leadership perspectives based on an egocentric, heroic and individualistic view are no longer suitable in the context of leading ICT reforms (Hutton, 2014). Therefore, leadership is seen as a social distribution where the leadership function is stretched over the work of many individuals. This means that elastic boundaries and co-enactment between school leaders and teachers are crucial. Sun *et al.* (2014:614) likewise posit that various functions of leadership, which promote the implementation of reforms, are “distributed across leaders with formal authority and informal leaders who are influential by their positions within the professional network of a school”. Tondeur *et al.* (2012) also analyse leadership from a distributed leadership perspective and stress ways in which ICT leadership could be stretched among persons, tools and practices. Distribution of responsibilities would enable the sharing of ICT knowledge and expertise for successful integration of ICTs into the classrooms. Liljenberg (2015) concurs that leadership functions are, or should be, widely distributed. This affords ICT management and teachers the opportunity to collaborate and engage in performing the roles and responsibilities of ICT leadership with or without formal designation. The key question is how and in what way does distributed leadership contribute to the school leaders and teachers’ integration of ICTs into education? Theoretically, distributed leadership provides little more than an abstract way of

examining ICT leadership practice (Hargreaves, Boyle and Harris, 2014). Yet Sucozhañay *et al.* (2011) indicate the powerful and critical impact of distributed leadership and suggest that reform is unlikely unless patterns of leadership and practice are adjusted and flattened. Multi-currency, multi-school and multi-phase working are therefore viewed as impossible without the reconfiguration of leadership as a practice rather than a role. Figure 9 lists four main tenets of distributed leadership drawn from literature, indicating that ICT leadership has links with many groups of people and sources of ICT knowledge and skills that could be used for implementing ICTs in the curriculum (Albugarni and Ahmed, 2015; Day and Sammons, 2013; Spillane *et al.*, 2015). Distributed leadership recognises that leadership practices in schools involve multiple individuals from all levels (Ho and Ng, 2017) implying that besides senior management, followers also have the capacity to perform leadership roles and responsibilities, with or without formal designations.

### Distributed leadership perspective

- 
- 1 Distributed functions across formal and informal leaders in the organisation
  - 2 Interaction with various individuals
  - 3 Involvement of multiple individuals in decision making processes
  - 4 Giving staff members' autonomy

Figure 9: Tenets of distributed leadership

Source: Self-illustration adapted from literature (Day and Sammons, 2013)

Recent studies show that distributed leadership (DL) does not imply that formal leadership structures within the organisation are dismantled or redundant but links continue to exist between vertical and horizontal leadership processes (Tan and Ong, 2011). The most important feature becomes interaction, which implies more

action, as leadership functions are accomplished through the interaction of multiple leaders. Day and Sammons (2013) understand distributed leadership as an activity and interaction between school leaders and teachers. Day *et al.* (2010) clarify that associations exist between vertical and lateral leadership processes while the most critical element is interaction compared to mere leadership action. Thus, interaction among school leaders, teachers, learners, parents and the wider school community is one of the key features of (DL). Others perceive DL as an emergent property of a group or network of interacting individuals (Goodwin *et al.*, 2015). They examined the transformation of educational systems and concluded that when individuals interact freely, they enact their practices as part of a broad-based leadership practice where staff members get the opportunity to share knowledge and expertise for improved school and student outcomes. It is believed that collaborating and actively engaging in school initiatives promotes creativity and enhances the attainment of institutional goals (Ottestad, 2013). DL regards school leadership as a collaborative team effort where instructors are viewed as leaders in the classrooms (Harris, 2014). Another important tenet of DL is the involvement of many people in the decision-making processes affecting the organisation. It is assumed that staff involvement in the decision-making processes contributes to collegial relationships, which result in positive improvement and change. Jo *et al.* (2015) conducted an empirical analysis of the impact of perceived leadership styles and trust on team members' creativity in Korea, confirming that when people are incorporated in decision-making, school effectiveness and learner achievement are improved.

The model is also based on the idea of empowering staff and creating a situation of open boundaries; this being the principle leadership aspect that enables followers to be innovative and effective in the implementation of new reforms. Spillane and Orlina (2005) and Spillane *et al.* (2015) promote the development of an "allowed-to-be-a-leader" culture, where principals avoid leading and treating staff as followers but regard them as leaders (teacher-leaders). The old concept of "hierarchy" implies that leadership is based on power and authority; however, by developing teachers into leaders through empowerment, the principal should be prepared to "let go" of the idea that leadership is hierarchically distributed. Instead, value is placed on community and relationship in an ethical type of distributed leadership based on empowering individuals through recognition of their work as human beings. On the

other hand, the literature reveals that the distribution of leadership varies according to expertise because of the needs of different tasks, especially where the expertise does not reside in one person at the top, the principal. The role of the principal is complex and demanding to the extent that it is unrealistic for one person to perform that role without the assistance of several members from the teaching and non-teaching staff (Goodwin *et al.*, 2015). Community members become leaders according to the value or worthiness they bring to the community such as their expertise, skills, links with other members beyond the community or their access to resources.

#### **2.4.2. Relevance of distributed leadership in analysing ICT leadership**

Methodologically, researchers found that using a distributed perspective to frame research into leadership and management may require secondary data collection tools (Spillane and Healey, 2010), as labour intensive and costly ethnographic and structured observation methods are needed. The strategies generate rich insights into leadership practice but are typically limited to small sample sizes that make it difficult to generalise to larger populations. Developing valid and reliable means to establish school leadership practice is said to be challenging since the practice potentially spans the entire school, involving the efforts of formally designated leaders and others (Alenezi, 2015). That means, distributed leadership (DL) is not necessarily confined to leadership structures as it can happen any time including after hours, weekends and during lunch or break time. Fairman and Mackenzie (2015) argue that DL is ideal for providing alternatives and potentially illuminating ways of tracking, analysing and describing complex patterns of interactions, influence and agony. It can be understood from literature that DL is not a good or bad tool, but it all depends on the context within which leadership is distributed and the tone of the distribution. Liljenberg (2015) and Spillane and Coldren (2015) found that DL was effectively utilised to set up developing and learning school systems in the Swedish context. Therefore, it is the nature and the quality of leadership practice that matters in a specific set up, not the flattening of the hierarchy or delegation of leadership.

Evidence from prior research reveals a strong relationship between distributed patterns of leadership and institutional performance (Evans, 2014; Harris and Jones, 2015a), providing the idea of DL as a positive strategy for innovations. The Organisation of Economic Co-operation Development (OECD) (2015) as well as Louis *et al.* (2014) and Printy's (2014) studies on leadership perceptions in educational organisations find that distributed leadership plays a significant role in the promotion of continuous professional development and building of professional learning communities. This is done through shared leadership functions, interaction, involvement and empowerment of staff members across internal and external boundaries. The studies concluded that stretching leadership roles and responsibilities beyond the school principal is a key lever for developing effective professional learning communities where ICT knowledge and expertise can be easily pulled together in a collective, coordinated and collaborative way for successful implementation of ICT reforms. Leithwood *et al.* (2010) suggest a positive link between school transformation and DL, especially where leaders' norms and values also correlate. The implication is that school principals as ICT leaders should promote a culture of collaboration, collectiveness and coordination to give teachers opportunities to work together and lead school development and implementation of ICT reforms.

A scrutiny of the proposed factors reveals that effective distributed leadership hinges on the values, attitudes, beliefs, disposition of trust, experience and knowledge of the ICT leadership. Bektaş (2014) found that a strong correlation between staff values, norms and behaviours of principals and teachers resulted in positive school attainment. In particular, Day *et al.* (2010) assert that the issue of trustworthiness between principals and their subordinates, and the extent to which teachers can be trusted to lead others, is a key factor to be considered. The above scholars stress that repeated acts of trust among members enables increasing distribution of roles, responsibilities and accountability, which in turn broadens stakeholder participation. It can be inferred from the foregoing discussion that by using the distributed leadership perspective for ICT integration into the school curriculum, the principal recognises that everyone contributes to the overall goal of ICT integration. In such a context, a sense of community of practice, which Jita and Mokhele (2013) as well as Wei, Piaw and Kannan (2017) recommend, would prevail and relevant ICT expertise

would be recognised whenever it is discovered. It is likely that appropriate structures would be created and reformed for effective implementation of new ICT reforms and school improvement. This provides grounds for collaboration and participatory decision making, as a climate of unity and trust exists and as ICT leadership is exercised through formal and informal roles and activities. Waxman *et al.* (2013) assert that ICT leadership is practised through mutual interactions and influence and through organisational routines and practices. The aspect of environment or situation matters in the interdependence between leaders, followers and the situation, while each teacher is valued and supported in their professional practice.

Even though ample research has identified the merits associated with distributed leadership theories, some scholars argue that it is grossly unfair to ignore the cultural, structural and micro-political obstacles operating in schools, militating against the application of distributed leadership (Grimmelikhuijsen and Feeney, 2017). Three major hindrances that were identified include the argument that the leadership style is a threat to those already in formal leadership positions in terms of their ego and perceived authority, which they might not be ready to relinquish to followers within the system. The assumption, according to Bektaş (2014), is that the principals fear they might be placed in a vulnerable position to lose respect and power to subordinates. Secondly, Day and Sammons (2013) assert that current school structures that are rigid and are led or managed through top-down hierarchies demarcating specific roles and responsibilities hinder staff from gaining autonomy to assume leadership functions. Jo *et al.* (2015) conclude that top-down approaches to distributed leadership can be perceived as misguided delegation if not appropriately conducted. Similar findings were documented in a study of distributed leadership in the United States by Printy (2014) where hierarchical norms, routines and protocols disturbed the use of shared and distributed leadership approaches within schools.

However, there is still sufficient research evidence to show the merits of the distributed leadership approach on school improvement and student achievement, even though the model is associated with the drawbacks discussed in this section. Spillane *et al.* (2015) note that the DL perspective offers actual possibilities of examining leadership through a new and alternative lens that challenges the tacit understanding of the link between leaders and followers. It suggests that followers

are a key feature in defining leadership through interaction with leaders, demonstrating that leadership has a greater influence on institutional change when leadership practice is purposefully distributed. Alkrdem (2015) and Harris (2014) also argue that new reforms can be effectively utilised if the school leaders harmoniously interact with their followers working in a conducive environment which support teachers in the efforts to embed the technologies into lessons. It is against this background that this study adopted the distributed leadership model, among others, to investigate and understand how principals in public schools enact their leadership roles in different school structures, where other staff members are involved in ICT leadership. This perspective therefore necessitates that the study carries out an in-depth analysis of the practice of principal leadership, not just the practice of leaders as individuals.

#### **2.4.2 Transformational leadership perspective**

Several studies have suggested the use of transformational leadership as the most relevant frame to guide studies on the current environment of reforms (Leithwood and Sun, 2012; Leithwood *et al.*, 2010; Ottestad, 2013). Geijsel *et al.* (2003) view the framework as having significant positive impacts on implementing educational reforms such as the implementation of ICTs into the school curriculum, yet few studies have been conducted on the applicability of such a leadership model to explore principal leadership for the integration of ICTs for teaching and learning in public secondary schools (Ng, 2015). Evidence shows that the theory is often correlated with vision, setting direction, restructuring and realigning the organisation, developing staff and curriculum and involvement of the external community for the improvement of school standards. The perspective is said to be based on the leader's personality traits as well as the capacity to implement reforms through articulating an energising vision and challenging targets. The model therefore, emphasises a shared vision between leaders and followers to attain set targets, finding that if the principal can articulate and vividly describe subordinate functions, then transformational leadership can positively affect the perceptions, beliefs and practices of subordinates. With the advent of new reforms such as ICTs and other innovations, schools require transformational leaders. In their studies of successful

leadership Day and Summons (2013) and Sun *et al.* (2013) identify three tenets of the transformational leadership perspective, namely: building vision and setting directions, understanding and developing people and redesigning the organisation. These are presented in Figure 10 below.

### Transformational leadership perspective

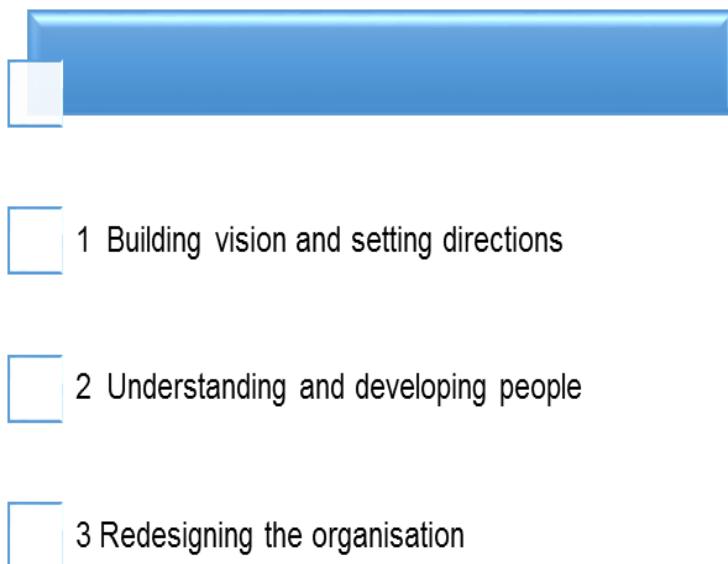


Figure 10: Tenets of the transformational leadership perspective

Source: Self-illustration adapted from literature (Day *et al.*, 2010; Sun *et al.*, 2014)

This element of transformational leadership focuses on establishing a unified shared vision and purpose to stimulate staff motivation, so that staff members are inspired to work willingly beyond normally expected limits (Abdullah *et al.*, 2013). Alyami (2014) finds that a unified shared vision and purpose are closely linked to effective school leadership, which is centred on staff motivation, inspiration, clarification of goals and objectives, strategic planning and direction setting. A shared ICT vision implies that there should be consensus on what should guide the teachers in the integration of ICTs within the schools. Ottestad (2013: 109) believes that to build a supportive context for staff, it is important for principals to create “a shared vision and employ systems thinking”. The model therefore implies that ICT leaders should determine a vision for the school by working collaboratively with staff. The second dimension of transformational leadership is said to be crucial in staff motivation. However,

Hallinger and Heck (2011a) conclude that transformational leadership is most important in building staff knowledge, skills and dispositions to help them to persist and persevere in performing their duties and responsibilities. The concepts of offering individualised support and intellectual stimulation, while modelling desirable values and behaviours, are also viewed by Ng (2015) as significant. The concept of redesigning the organisation relates to the establishment of conducive working conditions that promote teachers' effectiveness in applying ICTs within their lessons to improve student achievement. Louis *et al.* (2014) note that staff motivation, commitment and capabilities are raised when good relationships and mutual understanding exists between leaders and followers. Elements of organisational renewal are also supported by building collaborative cultures, teams and productive relations with internal and external members (Day and Sammons, 2013). Geldard *et al.* (2014), from their study of the relationship between transformational leadership and knowledge management, also conclude that establishing sound rapport and interpersonal relationships with staff and the wider community is a recipe for organisational effectiveness and efficiency.

#### **2.4.2.1 Relevance of the transformational leadership perspective in analysing ICT leadership**

Studies on transformational leadership have attempted to uncover the leadership practices that support institutional values and help to achieve goals (Ng, 2015). Important relationships have been observed between features of transformational leadership and teachers' own reports of transformation in terms of their beliefs, attitudes and practices towards school effectiveness and improvement. Hallinger *et al.* (2014) demonstrate that this theory is a credible conception of principal leadership and is specifically relevant to an educational organisation implementing new reforms. Hatlevik (2014) asserts that principals should realise that successful management for ICT incorporation occurs through transformational leadership. This theory therefore guides the study in establishing the leadership practices and functions that principals enact in support of the integration of ICTs in the school curriculum. Leithwood and Sun *et al.* (2013), reiterates that transformational leadership facilitates a redefinition of people's mission and vision, a renewal of their commitment and restructuring of their system for goal accomplishment. A

relationship of mutual stimulation and elevation converts followers into leaders and moral agents. A close analysis of this quotation reveals that the transformational leadership theory, when applied to schools, enhances student learning through a shared mission and vision, fostering a collaborative culture of accepted group goals and by communicating high performance expectations among teachers and students. It also provides appropriate role models, individual support and intellectual stimulation, promoting participation in school decisions, building a productive school climate and ensuring opportunities for teachers to learn through professional development (Wei, 2016:22). Others such as Ng *et al.* (2015) find that innovations to integrate ICT into education often lack a solid rationale.

Similarly, Sugai *et al.* (2012) concur with Firmansyah *et al.* (2014) who conclude that for a school to be effective in incorporating ICT in support of teaching and learning, the school must have a clear vision of the learning it is aiming to foster and the organisation it is aiming to be; however, such a vision is often lacking. It is against this background that the transformational leadership perspective has been employed as a lens to examine leadership practices that are enacted by public secondary school principals in support of the integration of ICTs for teaching and learning within schools. However, Firmansyah *et al.* (2014) caution that this leadership perspective should be viewed as only one part of a balanced approach to creating high performance in schools. This is the reason why the study used it to complement distributed and pedagogical leadership perspectives. According to Harris *et al.* (2014) and Ng (2015), although Leithwood *et al.*'s (2010) form of transformational leadership has several merits and is relevant for principals' use, due to the complexity of educational management and leadership, the theory on its own may not be able to enhance the researcher's ability to describe, understand and explain the role of leadership in ICT integration. They argue that the perspective concerns the institution and is thus contingent upon rather than integrated with education. Large-scale surveys including school leadership interviewed in-depth are needed to attain theoretical triangulation of quantitative indicators and give complete explanations (Antoniou, 2013). On this basis, the study adopts a sequential explanatory mixed-methods approach using a sample of 280 public secondary school principals. Previous studies have recommended that investigations include other types of leadership that may not necessarily be transformational. In this study,

the transformational leadership perspective is meant to complement the other two perspectives, distributed and pedagogical (instructional leadership). The motive behind employing a transformational leadership perspective is that it has several merits suitable for this study. Day *et al.* (2014), Ottestad (2013) and Printy (2014) combined different theoretical approaches to leadership in an integrated way, highlighting the transformational role of ICT leaders as ground work for authentically sharing the work of ICT pedagogical leadership with teachers to ensure the integration of the technological devices within the schools.

#### **2.4.3 Pedagogical leadership perspective**

Murphy, Hallinger and Heck (2013) and Hallinger and Lee (2012) identify pedagogical leadership as the most significant dimension with the greatest impact on students' achievement. The incorporation of pedagogical leadership would sharpen the focus of the study by offering a framework for the "what" of principals' leadership practices. While the transformational leadership perspective values ICT vision and inspiration, pedagogical leadership emphasises the significance of setting clear ICT educational goals, planning ICT curriculum delivery, evaluating staff and the achievement of learner outcomes. Figure 8 displays the main tenets of pedagogical leadership. These tenets of pedagogical leadership, commonly known as instructional leadership; indicate that the model prioritises the promotion of quality instructional practices meant to improve student outcomes.

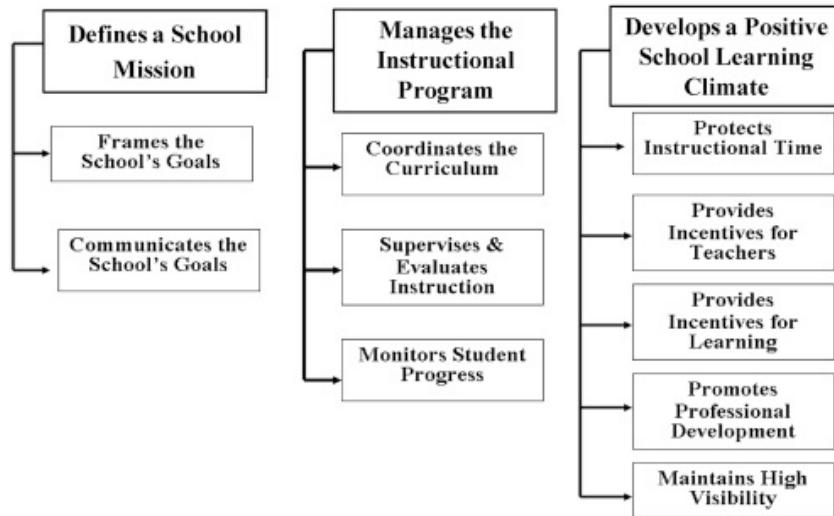


Figure11: Tenets of pedagogical leadership dimensions

Source: Hallinger and Murphy (1985:221)

As echoed by Day *et al.* (2010), effective principals holding this perspective centre actions and relations with staff on the core business of teaching and learning to influence the attainment of learner outcomes. The three tenets of pedagogical leadership require the ICT leader to be deeply engaged in stimulating, supervising and monitoring the integration of ICTs in the teaching and learning process in the school. This places a premium on principals' pedagogical knowledge, in line with Alfelaij (2016) and Orlando (2013) as well as 's Slater's (2011) recommendations that instructional leadership for ICT should focus on setting a direction for pedagogical practices and assessments using ICTs, fine-tuned to match the school goals and context. The literature suggests that it is one of the major responsibilities of the school principal to create an ICT vision and also ensure close supervision and monitoring of teachers' ICT implementation activities for effectiveness and efficiency. Papaioannou and Charalambous (2011), who studied principals' attitudes to assess their level of computer use and perceived technological competence in using ICTs, found that principals who plan to coach and develop other teachers require ongoing professional development to boost their proficiency with ICTs and its integration into teaching and learning.

The pedagogical leadership perspective is compatible with and complementary to distributed and transformational leadership. Pedagogical or instructional leadership

is viewed in this study as being focused on the core business of embedding ICTs for teaching and learning within schools to improve student performance. Day *et al.* (2010) perceive pedagogical leadership as being focused on promoting student achievement or outcomes using ICTs in the classrooms. Therefore, pedagogical leadership points to the need for ICT leaders to be fully involved in teachers' ICT instructional practices by observing, counselling and offering professional development in the best ways of infusing the technologies within their lessons. The focus of pedagogical leadership, in contrast to transformational and distributed leadership, is on high expectations for student learning, wellbeing and achievement, as summarised in Figure 12.

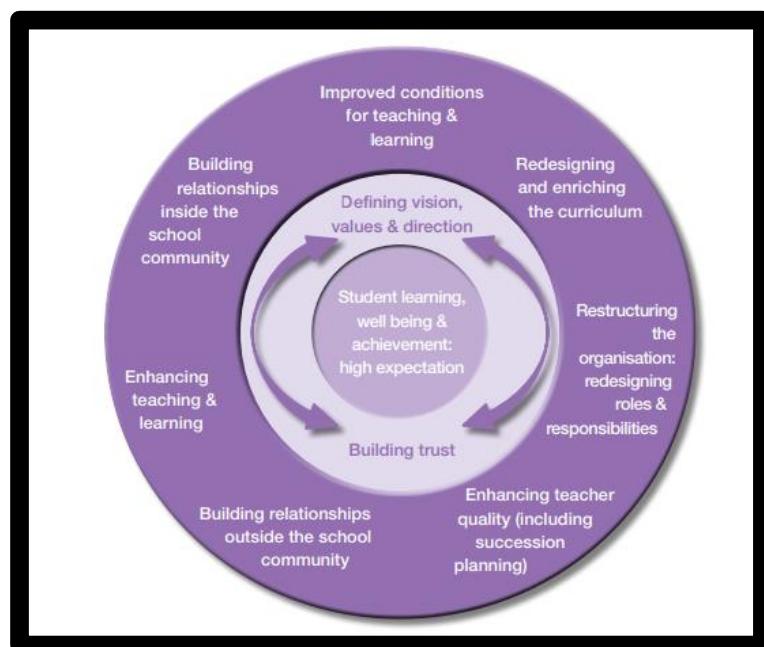


Figure 12: Dimensions of principal leadership for school effectiveness and efficiency

Source: Day and Sammons (2013:16)

The dimensions of principal leadership shown in Figure 12 reveal a combination of transformational and pedagogical leadership perspectives. Moore (2016) concludes that principals need to be highly knowledgeable and competent about implementing specific school innovations to be effective leaders. Day and Sammons (2013) also argue from a pedagogical leadership perspective that principals would not be able to bring about school improvement without possessing the essential general pedagogical knowledge, subject specific knowledge, curriculum knowledge and

knowledge of students. Day and Sammons (2013) further highlight the importance of emotional literacy and close-up participation in teachers' work, while attending to parental involvement in support of student learning and achievement. A meta-analysis conducted across the United Kingdom, Canada, Australia and the United States of America, incorporating the work of Day *et al.* (2010) and Harris *et al.* (2014), indicated that most school leaders would experience failure, disappointment, frustration, rejection and hostility at some time during their professional lives. It is argued that this situation would be experienced if they lack the emotional intelligence to utilise appropriate leadership dimensions for successfully implementing school initiatives and reforms. The implication of this finding is that principals need to possess the ICT knowledge and skills and blend their leadership models when necessary to ensure high expectations are achieved within conducive working school environments.

#### **2.4.3.1. Relevance of the pedagogical leadership perspective in analysing ICT leadership**

The meta-analysis carried out by Day *et al.* (2010) on successful leadership revealed that because pedagogical leadership focuses on the core business of schools in promoting effective teaching and learning, it is likely to have a larger impact on student outcomes (Printy & Williams, 2015; Razzak, 2015). The authors concur that the effect of pedagogical leadership is nearly four times that of transformational and distributed leadership perspectives, whose focus is mainly on staff relationships. Other researchers (Voogt *et al.*, 2013a) have interpreted pedagogical leadership as a top-down and directive theory specifically because it focuses on "turn around schools" in dire need of urgent reform. Hallinger (2005) describes pedagogical leadership as an idea that refuses to go away, even if it has not been well defined since its emergence in the 1970s. Instructional leadership therefore, focuses on teaching and managing the ICT curriculum policy in the present study, where the managerial role of principals as ICT leaders includes coordinating, controlling, supervising and developing the curriculum and instruction, based on an integration of ICT leaders' knowledge, expertise and charisma, where principals work directly with ICT classrooms practitioners. In a school context, the school principal is expected to comprehend the characteristics of quality ICTpedagogical practices and should have

adequate knowledge of the school ICT curriculum to be aware of the most suitable content being provided to students. Bhat & Beri (2017) emphasised the significance of provision of ICT orientation to teachers to promote the acquisition of ICT knowledge and skills. It is anticipated that school leaders possess the technological pedagogical content knowledge to develop staff and supervise teachers for the attainment of school ICT vision and goals. The Australian Institute for Teaching and School Leadership, in their Professional Standards for Principals, stress that principals must:

Work with and through others to build a professional learning community that is focused on the continuous improvement of teaching and learning, through managing performance, effective continuing professional learning and regular feedback, they support all staff to achieve high standards and develop their leadership capacity (AITSL, 2015:16).

The pedagogical leadership model is sometimes seen as being unrealistic as it is impractical for principals to possess expert knowledge in all areas, particularly at secondary school level. The OECD (2015) identified the educational leadership functions of principals, in other words, emphasising those that include the principal as a resource, communicator, strategic planner, quality controller and a visible presence, among others. The report also recognises that the wide range of demands placed on the principals as instructional leaders prevents them from giving adequate time and attention to their educational roles. It is on this understanding that this study incorporates instructional leadership alongside transformational and distributed leadership. The literature indicates that the complexity of schools today demands the distribution of leadership roles and responsibilities to improve and enhance teaching and learning and to relieve the burden of work on principals. The OECD (2015) and Weijt al.'s (2017) studies on improving school leadership support the development of positional leadership such as middle management and teacher leaders as key to school effectiveness and improvement.

The instructional leadership model has been criticised as a top-down and directive theory where principals appear to be highly directive leaders who single handily focus specifically on reforms on teaching and learning. Harris and Jones (2015) argue that the challenge to effective school leadership is when endeavouring to carry

the burden alone. Bektaş (2014) posits that school leaders need to work collaboratively with subordinates to achieve set targets especially through equitable distribution of leadership roles. Williams (2017) shares the same view, arguing that the days of the lone instructional leader should be over, since one administrator can no longer serve as the instructional leader for the entire school without substantial participation from other educators. Such considerations provide the rationale for the evolution of the notion of distributed and shared instructional leadership and the need to reconcile and blend features of various leadership perspectives to achieve the goals of school improvement and effectiveness (Ottestad, 2013; Louis *et al.*, 2014). For instance, it is noted from these scholars above that strong transformational leadership by the principal is also essential in supporting the commitment of teachers. Because teachers themselves can be either enablers or barriers to the development of teacher leadership, transformational principals are needed to improve the effectiveness of ICT integration into the school curriculum. Teachers share leadership functions when teachers perceive the principal's instructional leadership behaviour to be appropriate, thereby growing in commitment, professional involvement and willingness to innovate. Instructional leadership can itself be transformational.

#### **2.4.3.2. Justification of different theoretical frameworks in the study**

Since the proposed theories were tried and tested in different contexts at international and local levels, they are likely to be useful in guiding the current study. Table 2 indicates some of the scholars who have utilised similar theories to frame their studies on school leadership as well as technological leadership.

Table 2: Studies on leadership models for school principals

| <b>Author/Dat<br/>e</b>           | <b>Summary</b>  | <b>Conclusion and implication for the<br/>present study</b>   |
|-----------------------------------|---|---|
| Day, C.<br>Sammons,<br>P.<br>2013 | The aim of the study was to examine successful leadership for school improvement in developed countries such as the United Kingdom, the United States, Canada and Australia. The study used three concepts: transformational, | The study concluded that pedagogical leadership is four times more significant than transformational and distributed leadership, which focus on relations in promoting school effectiveness and improvement. The study proposed the |

|                      |  |   |
|----------------------|--|---|
|                      | pedagogical and distributed leadership to guide the inquiry. The quantitative study explores the influence of school leaders in school improvement. The results indicate the need for school leaders to develop emotional intelligence and combine leadership approaches for school improvement.   | combination of the three concepts. The present study employs distributed, transformational and pedagogical leadership perspectives to explore the roles of principals in the integration of ICTs for instructional practices in Zimbabwean public secondary schools.  |
| Printy, S.<br>2014   | The aim of the paper was to examine how principals influence instructional practices in United States schools. The study explored how principals and teachers interacted and shared leadership influence to improve instructional practices and student outcomes. The study used the eclectic model: principal-teacher relations, distributed leadership and collaborative inquiry.  | The study concludes with a proposal that principals and teachers should work collaboratively to achieve vision and goals for instruction. The present study uses the distributed, transformational and pedagogical leadership perspective to frame the study that explores the roles that principals play in the integration of ICTs for teaching and learning in Zimbabwe. |
| Kabanda, G.<br>2013  | The aim of the study was to explore the utility of digital technologies in the 18 Eastern SADC African countries. Chaos theory was used to examine variations in the use of technologies in education. The sequential explanatory mixed-method study explored the extent of technology use and availability to develop an endogenous growth model of knowledge economy for SADC countries. Results show that variations existed across the SADC region in the way technologies are utilised. | The study concluded that technology in the SADC is not exogenous and proposed the endogenous growth model for a knowledge economy for SADC. I used the sequential explanatory mixed-methods study to explore roles of principals in infusing ICTs into education.   |
| Ottestad, G.<br>2013 | The study aims to examine if conditions promoted by school leaders correlate with the use of ICTs in the classrooms by teachers. The study intended to explore the significance of school leadership in implementing ICTs in teaching and learning in the classrooms. Results suggested that school leadership plays a key role in integrating ICTs in the   | The study concluded that school leadership for ICT carries traits of distributed transformational and pedagogical leadership perspectives but proposed that more research is needed in using the models for ICT leadership studies. I therefore, consider the proposal and use different leadership models to study principals' roles in ICTs integration                   |

|   |   |   |
|---|---|---|
|   | classrooms.   | in Zimbabwean schools.  |
| Sun, M.,<br>Frank K.A.,<br>Penuel<br>W.R.,<br>Kim, M.K.<br>2013 | The study used the shared leadership models (distributed) and mixed-methods design to investigate the role of formal and informal leaders in the diffusion of external reforms into schools and to teachers' practices in 9 K-8 schools. The study aims to examine how formal and informal leaders promote instructional changes through professional interactions with teachers. | The study concluded that formal and informal leaders positively influence instructional practices directly and indirectly and suggested the use of various strategies and collaborative efforts to implement new reforms effectively. It proposed the use of the distributed model to support implementation of external reforms. I used distributed leadership to augment the transformational and pedagogical models to study school leadership and ICTs integration in Zimbabwe. |

## 2.5 School principals' knowledge and perspectives in support of ICT integration

International and local literature seem to concur that school principals play a pivotal role in enabling educational reforms, most importantly in the case of ICT development for pedagogical practices. Sun *et al.* (2013) explored the role of formal and informal leaders in nine K-8 schools in the United States of America and concluded that school leaders should collaboratively work together to be able to implement external reforms successfully. However, Ng *et al.* (2015) who explored the dimensions of instructional leadership in the practices of Singapore principals found that school principals played a pivotal role in defining the school vision and promoting school culture while the real duty of curriculum implementation and classroom instructional practices were the responsibilities of middle management teams as compared to principals. Implementation of ICT curriculum policy would therefore, require a high level of ICT knowledge and skills on the part of school principals to effectively supervise, monitor and enhance teachers' efforts in the integration of technological tools into their lessons. Thus, this section is meant to review literature on school principals' knowledge of ICT integration into education.

### **2.5.1 School principals' knowledge**

Technological knowledge and expertise have been perceived as the most significant requirements for teachers and technology leaders to achieve successful ICT implementation in education. Yet, ample studies reveal that many teachers and principals lack the knowledge and skills concerning ICT use (Chang, Wong and Park; 2016; Park and Kwon, 2013). Similarly, Mishra and Koehler (2006) and Msila (2015) contend that there is a strong relationship between teachers' knowledge and their practices in teaching specific subjects. The implication is that irrespective of the availability of technological equipment and facilities, ICTs will not be used unless teachers and principals have sufficient knowledge and skills to integrate these technologies into their educational practices. The authors, who also include Farrell and Isaacs (2011), argue that educators who lack the competencies to employ ICTs into teaching are not enthusiastic about reforms associated with the introduction of ICTs into instructional practices.

Hilman (2015) asserts that when instructors lack technical skills they are likely to be anxious about technical problems, as they would have less understanding of how to avoid or deal with challenges. Instructors' confidence to embed ICTs in the classrooms is viewed as a factor related to teachers' level of knowledge and skills. Alenezi (2017a), who studied technological leadership in Saudi Arabian schools, observed that principals who lacked competencies in simple ICTs hindered the implementation of these tools by teachers in the classroom. The author argues that principals needed knowledge of ICT applications such as word processing, spreadsheets, databases, email, websites and the internet to model their use to teachers during lesson supervision and demonstrations. Shadreck (2016) studied the knowledge and skills that teachers in Zimbabwe had, finding a lack of ICT knowledge, which negatively influenced their confidence and ability to infuse ICTs into lessons. The literature on Zimbabwe suggests that technologies have remained idle in the storerooms in many schools because principals and teachers lack ICT skills and knowledge (Konyana and Konyana, 2013; Shadreck, 2016). Several studies show that shared leadership is critical, since knowledge and expertise should also be shared and diffused among ICT implementers (Sun *et al.*, 2013; Louis *et al.*, 2014). The authors argue that when external reforms such as ICTs become a

learning tool in the classrooms, the teachers and school leaders must acquire the knowledge, skills and ability to incorporate ICTs into their instructional and administrative practices.

Waxman *et al.* (2013) in a study on "*Principal perceptions of the importance of technology in schools*", found that although ICTs offer a strategy for students' academic attainment, ICTs are not being embedded in education, especially for teaching and learning processes mainly because of educators' lack of knowledge and skills. Zhang (2014) found that most school principals are novice ICT users with scant experience or training in the ICT competencies required to become an ICT principal leader. Yet it is often argued that to facilitate the infusion of ICTs into schools by teachers, all school principals need to keep up with the newest technology. Firmansyah *et al.* (2014) argue that without ICT knowledge and competencies, principals find it challenging to assist teachers to comprehend the use and integration of ICTs into the classrooms. School principals therefore require a vast array of knowledge and skills, plus a repertoire of approaches, to have a clear understanding of how ICTs can be employed to improve instructional practices (Waxman *et al.*, 2013). The attainment of competencies in ICT use is regarded as a critical step in its integration in schools by world bodies such as the World Bank (2015) and UNESCO who dedicate huge financial resources to ICTs, especially in the developing nations. UNESCO (2014) proposes ICT competence standards for teachers, especially for professional development programmes to help policy makers and curriculum developers to identify the needs of teachers to harness ICTs in the service of education. The competencies include: a) basic knowledge of computers, b) proficiency in using productivity software, c) electronic communication skills, d) internet skills and e) moving files (World Bank, 2015).

For classroom practitioners, Mishra and Koehler (2006) have conceptualised this type of knowledge as technological pedagogical content knowledge (TPCK), which stresses the need for suitable knowledge of information and communication technologies. Buabeng-Andoh (2015a.) concludes that successful ICT integration depends on teachers' understanding of the interaction between technology, content and pedagogy and the tools themselves, particularly when teaching difficult concepts. Contrary to these views, Bukaliya and Mubika (2012) concur with Ertmer

and Ottenbreit-Leftwich (2010) that even knowing how to use hardware such as digital cameras, science probes in conjunction with software presentation tools and online social networking may be insufficient to help teachers to employ ICTs successfully in the classroom. Buabeng-Andoh (2015b) and Williams (2017) posit that teaching with ICTs requires teachers to expand their competencies and instructional practices in planning, implementing and evaluating teaching and learning, including choosing a suitable ICT application and managing hardware and software. According to Al-harbi (2014), the lack of such technology-related skills hinders the effective integration of ICTs into the school curriculum. On the other hand, several researchers including Day *et al.* (2010) and Louis *et al.* (2014) argue that it is the school principal's role and responsibility to assist teachers to acquire ICT related competencies and that without the principal's support to transform practitioners' knowledge, pedagogical beliefs, self-efficacy and attitudes, ICT policy and initiatives will not be implemented successfully. School principals must therefore promote teachers' use and implementation of ICTs.

Wei (2016) finds that principals who aspire to embed ICTs effectively in their schools must increase their own knowledge of ICTs, as they have a pivotal role to play in service and ensuring that teachers get the most relevant in-service ICT training. Chai *et al.* (2013) indicate that it is essential for principals to develop their knowledge and skills to be able to inspire and manage teachers in incorporating ICTs across the school curriculum, noting that the type and amount of technology training principals receive can make a positive difference to student achievement in schools. Therefore school leaders must be knowledgeable themselves in order to promote professional development and to assist teachers in embedding ICTs effectively into the school curriculum. Nikolopoulou and Gialamas (2016) also argue that the level of ICT integration is determined by principals' perception of their own competencies in employing ICTs in education but teachers' perceptions and beliefs and ICT policies need to be transformed in favour of the utilisation of ICTs for instruction.

Studies conducted by Petersen (2014), Razzak (2015) and Salleh and Laxman (2014) also argue that principals should have individual proficiency, competencies and knowledge in ICT use and integration and be aware of the significance of new technologies in education. Afshari *et al.* (2012a) and Al Mulhim (2014) find that most

school principals lack the necessary ICT literacy and background knowledge to be confident in dealing with ICT leadership in schools. Yet ICT knowledge and expertise of school leaders is critical in mentoring teachers in incorporating the technologies into their lessons. Baller, Dutta and Lanvin (2016) and Alfelaij (2016) concur that educators' ICT knowledge affects the rate and extent of ICT integration, as do beliefs, attitudes and perspectives, attitude being a learned pre-disposition to respond in a certain way to ICT use and integration. Without positive attitudes, they claim, it will be challenging to integrate ICTs into education.

The aspects of readiness, stimulation and motivation to learn, use and support ICT in schools are also viewed as a facilitator of ICT integration (Papaionnou & Charalambous, 2011). Al shahrani and Cairns (2015) argue that to live, learn and work successfully in an increasingly complex, information-rich and knowledge-based society, students, teachers and school leaders must employ technology effectively. In support of these views, Bingimlas (2009) and Schiller (2006) reveal a dual focus on principal leadership and school improvement in the 21<sup>st</sup> century, which highlighted the need for principals to excel at competencies related to the ICT curriculum policy implementation and the entire school system.

Bukaliya and Mubika (2012), in a study called '*Teacher competencies in ICT: implications for computer education in Zimbabwean secondary schools*' found that ICT competence is a popular theme regarded as one of the core competencies that must be developed in schools. The authors recommended that teachers and principals should possess basic ICT qualifications in word processing, internet and email, file navigation, spreadsheets and presentation software and database management systems. They report that the International Computer Driver's Licence alongside Diploma and Certificate programmes are viewed as basic qualifications for ICT leaders. On the other hand, "the use of Microsoft Word, Microsoft Excel, Microsoft Access and PowerPoint are regarded as the prominent areas for principals and teachers to possess hands on skills" as confirmed by Bukaliya and Mubika (2011:416). Computer Aided Instruction (CAI) was also viewed as one of the important skills for teachers, although the literature reveals that teachers in the Zimbabwean secondary school context lack such knowledge and skills (Zimbabwe ICT Education Policy Review, Framework, 2016). Yet, Buabeng-Andoh (2012) and

Ciampa and Gallagher (2013) as well as Alenezi (2015a) and Fu (2013) studied user perceptions of ICT adoption for education support and concluded that knowledge of ICTs is critical for the successful application of these tools in lessons.

### **2.5.2 Leadership perspectives of school principals for ICTs integration**

A survey by Collins (2015) of perspectives of teachers and school leaders in the use of the flipped classroom method in New York public schools found challenges in managing and using the multiplicity of ICTs such as email, voicemail, internet, cell phones and video-conferencing in education, even if these tools are known to be valuable. Goodwin *et al.* (2015), studying leadership development in Singapore, found that perspectives positively influence the use and infusion of technologies by teachers in their classrooms and propose the use of distributed leadership for sharing ICT knowledge and skills. Printy (2014) found that secondary principals could not be expected to provide substantive support to the multiple disciplines that are taught in middle and high schools and might lack a deep understanding of curricular content and instructional material that specialist subject teachers have. It is therefore advisable for principals to establish committees and distribute leadership roles across departments in secondary schools, as proposed by Garland (2010) and Spillane and Coldren (2015), stressing the development of improved learning environments for teachers and the capacity of principals to motivate, rather than provide direct support. Day and Sammons (2013), while noting that principals can never be content experts in all subjects, including ICT, suggest that principals should blend distributed transformational and pedagogical leadership perspectives in order to pull the expertise of all staff together to implement curriculum policies. This correlates with Ghamrawi's (2013a) opinion that principal leaders should migrate from management to leadership in schools, this being a decisive factor in change initiatives. According to Ghamrawi (2013a: 13), through management, "principals facilitate the work of the school by ensuring that what is done is in harmony with the rules and regulation, while through leadership, principals ensure that the work of the organisation is what it needs to be". Antoniou (2013) argues that managers are people who do the right thing. Contrary to this view, literature reveals that leadership and management functions should be utilised to complement each other for the

success of ICT policy implementation. Al harbi (2014a) as well as Al Mofarreh and Ibrahim (2016) contend that principals should be knowledgeable about supportive and classroom ICTs. Supportive ICT use is viewed as the application of ICTs for practical educational support such as school administration, classroom administration and preparation of worksheets and assignments, while classroom ICT use is regarded as the implementation of ICT for enhanced teaching and learning such as providing demonstrations and visualisations, drilling and practice activities (Almaliki *et al.*, 2014).

Aucoin (2011) and Iaquinta (2015) concur that the standards expected of principals in ICT implementation within schools need to be met without failure. Ottestad (2013) and Razzak (2015) support that the principals who are capable and competent in using technology play a critical leading and supporting role in ICT use and integration into classrooms. The authors agree that the success of ICT integration into classrooms is largely determined by the leadership perspectives and technological knowledge of the school principal. Bangert and Al shahri (2016) and Chang (2012) found that principals who utilised ICT for instructional and technical purposes found it easier to embed ICTs into new pedagogical strategies and were supportive of teachers' pedagogical use of ICTs for teaching and learning; their central perspective was to regard ICTs as crucial in education.

Waxman *et al.* (2013:194) suggest that future studies should explicitly explore school leaders' perspectives on ICT integration, since the "role, knowledge and perspectives of principals, as key decision makers in ICT integration", are critical. Competent principals in terms of ICTs have been found to be more successful in implementing ICT policies (Fabros-Tyler, 2014). However, Hatlevik and Guðmundsdóttir and Loi (2015) have observed that in order to facilitate the creation of digital citizens, principals are required to be visionary leaders, competent instructional designers and excellent professional educators. Thus, it is crucial for principals to be knowledgeable and to create sustainable relationships and a culture of ICT incorporation in their schools. In terms of leadership perspectives, these findings suggest transformational leadership as the most significant kind of leadership to determine and enhance ICT use within schools.

A large body of literature, which includes studies conducted by Hilman (2015), Jita (2016a) as well as Albugarni and Ahmed (2015), generally reveals that principal leadership perspectives influence levels of ICT infusion. Presby (2017) further argues that where players do not share a vision and a clearly defined and communicated role for ICTs in the school curriculum, school goals will not be achieved. Msila (2015) argues that staff development and equity of access to teachers and learners should be prioritised. King (2016) claims that principals who play various roles in order to ensure effective ICT integration into the school curriculum have been found to be complementing their pedagogical leadership practices with transformational, technological and distributed leadership practices (Abdullah *et al.*, 2013:794). However, Macleod (2015) notes situations where weak structures influenced the implementation of ICTs and educators had conflicting roles concerning ICTs such as discouraging students from using their own media devices. Abdullah *et al.* (2013:799) also stress that effective school improvement reforms require the entire institution working in collaboration to inspire and motivate everyone to achieve a well-communicated and shared ICT vision.

At the same time, principals are regarded as ICT change agents, leaders and champions to facilitate, promote and enhance its integration into the school curriculum. Several studies show that school principals need to embrace being distributed, transformational, pedagogical and technology leaders. As technology leaders, principals should develop and sustain effective approaches, techniques and procedures for teacher induction, development, evaluation and goal setting (Evans, 2014:180). However, such leadership skills are complex, subtle and sometimes elusive, requiring a deep understanding of professional teacher development. The OECD (2015) proposed that to enhance professional teacher development, principals must comprehend the process by which teachers grow professionally as well as the actual conditions that promote and enhance effective instructional practices. Williams (2017) notes the need for principals and teachers to protect their time and finances, to prioritise professional development, to maintain a high visibility and to cultivate a good school culture, which incentivises improvements to teaching and learning practices.

## **2.6 Practices characterising the enactment of principals' roles in ICT integration**

Since distributed, transformational and pedagogical leadership shapes the study, the practices that characterise the enactment of school principals' roles in support of the integration of ICTs for teaching and learning are examined from these three perspectives. The perspectives are viewed as complementary, with principal leadership for ICT integration in schools inherently being "a mixture of tenets from all perspectives" (Ottestad, 2013:109). Thus, principal leadership may be characterised by the sharing of formal roles and legitimacy and as a functional distribution of leadership tasks and responsibilities (Tan and Ong, 2011:1204). Leadership practice is viewed as what is done in a specific time and place to act in response to what is generally known as the urgency of practice (Spillane *et al.*, 2004).

### **2.6.1. Distributed leadership practices**

Harris and Jones (2015) find that a distributed leadership perspective includes the setting as a unique feature of school leadership and as such, is applicable to the context of this study. Spillane *et al.* (2015) are of the opinion that distributed leadership is supported as an instrument or frame for exploring and examining leadership practice and is complementary to other perspectives such as the pedagogical and transformational dimensions, since it specifically focuses on the "how" part of leadership rather than the "what". This study focuses on what Spillane *et al.*(2015) termed the "leader-plus" aspect, implying that the various roles of principals in support of ICT integration are distributed among leaders with formal authority and others with informal authority by virtue of their position within the school (Sun *et al.*, 2013: 614). Liljenberg (2015) also appreciate the value of employing distributed leadership practices for the enhancement of instructional leadership, a view that parallels and sanctions the nature of the framework utilised for this study, without rejecting the merits of other leadership theories. Jita (2010) argues that it is important to understand the leadership practices of each of those who lead and their relationships to promote effective teaching and learning among

staff. Figure 13 summarises some of the identified key distributed leadership practices of school principals.

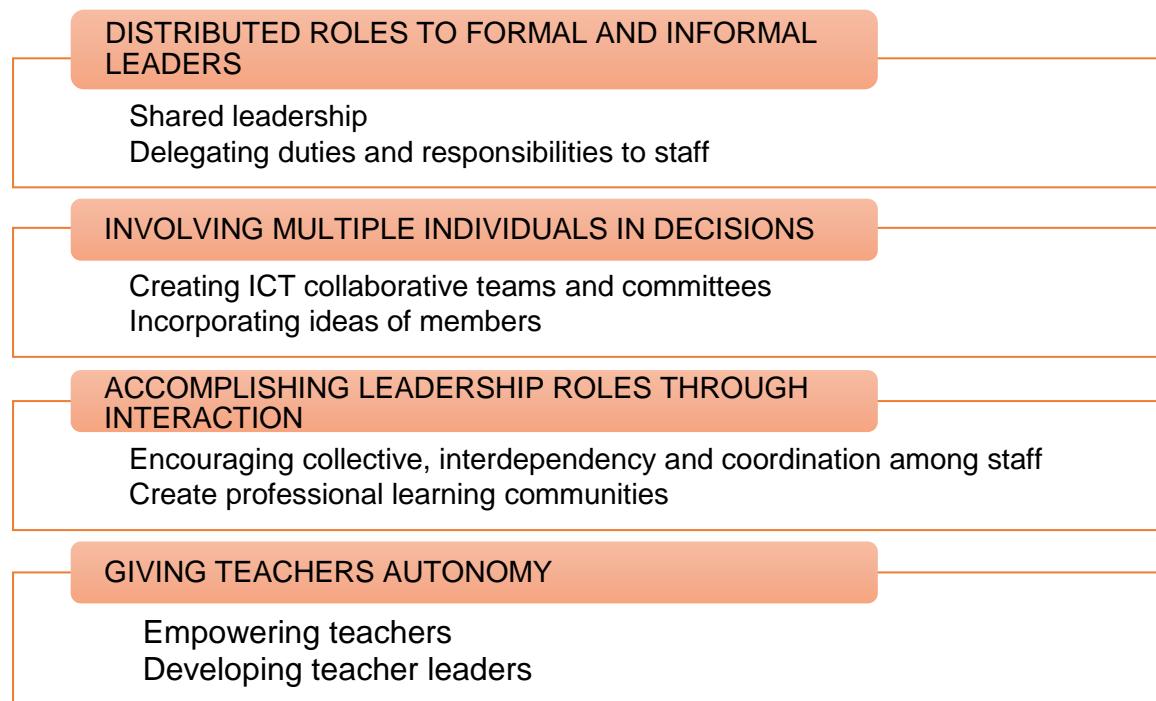


Figure 13: Distributed leadership practices

Source: Self-illustration adapted from literature (Day and Sammons, 2013)

#### i. 2.6.1.1 Distributed leadership roles across formal and informal leaders

It is challenging for the principals to lead schools successfully and single-handedly in respect of ICT implementation, as the capacity of any principal to shoulder sole responsibility for integrating ICTs into the curriculum is limited. Liasidou and Antoniou (2015) suggest that the principal should delegate key responsibilities to department heads and ICT experts. King (2016) and Ho and Ng (2017) concur that a shared perception of leadership is better for educational practices, challenging the traditional egocentric, heroic and individualistic notions of leadership; this is especially the case when principals are not the only change agents in ICT reforms and where multi-level leadership structures have been created..Members of staff such as heads of department (HODs), ICT teacher activists, teacher leaders and non-teaching staff may also be involved in leadership for ICT incorporation, with or without formal designation. School principals thereby emphasise leadership

functions as activities and interactions between themselves and others at all levels, and in instances where teachers and learners require help to define guidelines for use of ICTs. Teachers are viewed, at minimum, as leaders in their classrooms. Ottestad (2013:109) argues that school leadership should be regarded as a collaborative team effort where stretched boundaries and co-enactment between school leaders and classroom practitioners plays a pivotal role in the integration of ICTs. The leader strives to promote cooperation so that team endeavours are utilised for the attainment of the school vision and student achievement. According to Alyami (2014), an ICT team should be capable of positively influencing and realising leadership decisions within the school system. Alenezi (2017b) suggests that teams could comprise the school principal, ICT coordinators, teacher leaders and competent teachers. In this case, the leaders create effective and efficient teams based on several factors, which include their knowledge, expertise and experiences. Warren (2016) agrees that teachers in such schools play the roles of teacher leaders encouraged to use their ICT knowledge and expertise to innovate instructional practices, train peers and challenge their traditional roles as mere classroom practitioners. In such cases they become what Printy (2014) termed knowledge activist teachers who could be helpful to principals who are genuinely concerned about the effective integration of ICTs.

In the distributed leadership context, school leadership is best understood as a distributed practice, stretched over the school's social and situational settings (Harris, 2014). Research indicates that principals play the role of identifying, acquiring, allocating coordinating and utilising the social material and cultural resources at their disposal to establish the conditions for staff innovation and creativity in teaching and learning (Day *et al.*, 2010). Based on this understanding, Harris *et al.* (2014) and Sun *et al.* (2014) assert that the most significant leadership practice of the school principal is to encompass the practice of the multiple individuals within the school, operating at mobilising and guiding staff in the teaching and learning processes. The practice is based on a one-person activity but also as an endeavour to be accomplished by multiple leaders, centred on the identification and enactment of leadership functions executed by formal and informal leaders. The multiple leaders may include principals, assistant principals, subject experts, ICT coordinators, other teachers and non-teaching staff involved in mentorship,

supervision and staff development. Thus, the major focus is on the “practice aspect” of distributed leadership in which leadership tasks and responsibilities are enacted through interactions between leaders and others.

Evidence shows that distributed leadership practices offer principals and staff the opportunity to interact (Sun *et al.*, 2013). The principals accomplish their leadership functions through interaction with teacher leaders at various levels. Teachers, who are leaders within and beyond the classroom, identify with and contribute to the community of teacher learners and leaders. They also influence others towards improved educational practices. Contrary to the ideas of distributing leadership roles and responsibilities, Goodwin *et al.* (2016) and Ho and Ng (2017) query the feasibility of such a distribution of roles, especially in hierarchical structures based on power and authority. Fairman and Mackenzie (2015) propose the use of teacher leaders to assist principals in supervising and coaching staff in the implementation of new reforms within schools. However, Ciampa and Gallagher (2013) query what exactly should be distributed in these hierarchical institutions characterised by centralised authority and maintaining the leaders’ status quo. Harris and Jones (2015a) posit that distributed leadership is the way forward but acknowledge that the language of distributed leadership may merely provide teachers with a comforting sense that if tasks and responsibilities were distributed, the quality of their institution would be strengthened. Thus, the major focus is on the “practice aspect” of distributed leadership, in which leadership is enacted through interactions between leaders and others on tasks or responsibilities. However, Cardno and Youngs (2013) and Hallinger *et al.* (2013) argue that this may not be feasible, especially in schools functioning in a hierarchical paradigm. Ho and Ng (2017) encourage all players in the school community to pool their resources and expertise to work collectively and collaboratively in an interactive way. This leadership-plus aspect acknowledges the work of all individuals who have a stake in leadership practice, whether they are formally designated as leaders or not, and the leadership practice aspect influences sound interactions and situations within institutions. This confirms that distributed leadership practices have positive effects on teacher motivation for incorporating ICTs into schools to improve student achievement (Harris, 2014).

Hutton (2018) and Ng *et al.* (2015) argue that as schools reposition and redefine themselves, and as teachers are given more autonomy to implement ICT as they wish in their classrooms, distributed, extended and shared leadership practices are more prevalent. Distributed leadership is essential to cross multiple forms of boundaries to share ideas and insights. However, Spillane *et al.* (2004) note that school leadership is a practice of leading instruction and linking leadership practice and dimensions of pedagogy accordingly. The authors spelt out that the way in which leadership is distributed varies among subject areas, depending on the nature of the subject and year group. For example leadership for literacy is better shared between a principal and assistant principal while a language, art, science or mathematics were deemed suitable for coordinators or specialist teachers. As teachers share digital lesson plans and develop their own teaching materials, they are also engaged in deciding when and how ICTs are to be used. Extending this notion to subject learning, students can also be given the responsibility for their own learning (Ottestad, 2013).

For teachers to be fully empowered, Cardno and Youngs (2013) as well as Spillane (2015) propose the promotion of and development of an “allowed-to-be-a-leader” culture within the school, as one of the most significant distributed leadership practices that school principals can utilise for ICT integration into education. The principal must be prepared to “let go” of the idea that leadership is hierarchically distributed but rather emphasise learning community relationships, an ethical notion of distributed leadership based on empowering followers through recognising their worth as human beings. The community aspect stresses elements of unity, trust and shared vision, while Hall (2012) argues that leaders do not have to see eye-to-eye or even get along with one another to co-perform leadership routines and tasks. Although policy implementation may be distributed to teachers, financial resources and human resources are for principals. However, the OECD (2013) found that in a channel of accountability, principals might be less willing to relinquish power as this might leave them vulnerable due to a lack of direct control, especially in financial, legal, human resources and policy matters.

The studies conducted by Spillane and Coldren (2015) and Warren (2016) showed that distributed leadership varies according to expertise because different tasks will

require different expertise and this may or may not reside in one person, such as the principal. Hallinger and Bridges. (2017) argue that the role of the principal is now so complex and demanding that it is unrealistic for any one person to perform the role without the help of teaching and non-teaching colleagues. Harris *et al.* (2014) contend that teachers harbour leadership capabilities waiting to be unlocked and engaged for the good of the school and suggest the need for teachers' professional development and creation of communities of learning, linking professional development and leading. On the same note, within the concept of distributed leadership, unity and trust are viewed as linked to support and underpinning value, while the notion of reciprocal interdependency implies that one leader's practice becomes the basis for another leader's practice. Creemers, Kyriakides and Antoniou (2013) suggest that school leaders should play a dual role in linking distributed leadership to student learning by being effective ICT leaders and developing the ICT leadership capacity of others. Hence, leaders will not function in a vacuum but must facilitate opportunities for staff members to work collectively and collaboratively (Chang *et al.*, 2016). In this respect, school principals play a pivotal role in connecting school activities at various levels and distributing the skills of individual members across the entire institution through teams, committees and other groups to address instructional issues on a regular basis.

Day *et al.* (2014) and Moore, (2016) argue that principal leadership demands that expertise is shared among all members for effectiveness in ICT utilisation in lessons but these authors claim that distributed leadership is unlikely to happen if schools stay with hierarchical structures using top-down leadership styles. They go further, claiming that such schools are unlikely to transform themselves without distributed leadership roles and practices, as these promote creativity and innovation among teachers (Hallinger and Healey, 2010) at the same time as generating commitment to the vision of the school. However, Price (2014) and Moore (2016) argue that such leadership practices should be enacted in the form of interactions between principals and subordinates, instead of a function of one or more school leaders.

## **2.6.2 Transformational leadership practices in support of ICT integration**

Recent studies show that with the development of ICTs and innovation, schools require more transformational leaders (Afshari *et al.*, 2012:165) and that transformational leadership is said to happen when one or more individuals engage with others in such a way that leaders and followers raise one another to high levels of motivation and morality (Geijssel *et al.*, 2003). Thus, transformational leadership has been identified as one of the most significant factors affecting and promoting the incorporation of ICTs into schools. Williams (2017) also found a correlation between transformational leadership and the perceived usefulness of ICTs for teaching and learning. In integrating ICTs into schools, transformational leaders are expected to play various roles in support of ICT policy initiatives. Ng (2015) asserts that it is crucial to analyse transformational leadership as the kind of leadership that may be suitable for ICT reform in schools. Transformational leaders, who create a conducive climate for effective ICT integration, demonstrate Leithwood *et al.*'s (2010) transformational leadership perspective as applied to schools and on which the current inquiry is focused. However, other scholars express concern that this theory is not democratic but is effectively a managerial tool for directing institutions to deliver the wishes of school leaders. Figure 14 summarises the main transformational leadership practices identified from the literature.

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#### SETTING DIRECTION

- Building a shared vision
- Developing consensus about goals and priorities
- Creating high performance expectations

#### DEVELOPING STAFF

- Providing individualised support
- Offering individual stimulation
- Modelling important values and practices

#### REDESIGNING THE ORGANISATION

- Building collaborative cultures for ICT integration
- Creating and maintaining shared decision making structures and processes
- Building relationships with parents and the wider community

*Figure 14: Transformational leadership practices in support of ICT integration*

Source: Adapted from Day and Sammons (2013)

Identifying and articulating a vision is considered one of the key roles of school principals in support of the infusion of ICTs for instructional purposes. Ng (2015) describes the practice as useful in identifying new opportunities for the school and developing, articulating and inspiring others with a vision for the future. A shared vision guides and develops the strategic plan, directing and enabling all people to take on responsibilities and contribute their innovation and to work as a team (Al harbi, 2014b). However, Ndawi *et al.* (2013), who studied barriers to the integration of ICTs in Harare, found that effective integration of ICTs required a specific national policy on the use of ICTs in secondary schools, clearly communicated to principals, so that schools have a clear sense of direction on how to integrate ICTs in classrooms. Geldard *et al.* (2014), who studied the relationship between transformational leadership and knowledge management, concluded that a shared vision and empowered leaders are key to the success of ICT integration into schools; teachers would whole-heartedly integrate ICTs if it were a national policy and if school leaders developed ICT integration plans. The World Development Report (World Bank, 2015) found that in most developing countries such as Zimbabwe, there was still limited use of ICTs in classrooms due to the lack of a clear sense of direction on how to use ICTs. Therefore, it is incumbent on leadership to create a common vision of learning and to organise and shape institutional structures, culture, processes and people towards the attainment of the shared common vision. Harris and Jones (2015a) concur that if there is no shared vision, there is likely to be resistance, as staff would not feel involved in the reform initiatives.

Tondeur, Van Braak and Valcke (2007) and Tondeur *et al.* (2012) propose that before any school can have effective policies and practices to incorporate ICTs, the school must have a clear vision of the learning it is aiming to deliver. It is the responsibility of the principal to develop and communicate a unified and shared vision for the school. This confirms that there is a real need for schools to develop a shared vision for ICTs in education, clarifying intentions and identifying its value to stakeholders before implementation. By setting direction and communicating a common vision to teachers, transformational leaders assist and encourage staff to identify with the vision and to sacrifice their self-interest for the good of the school and its students.

Besides setting direction, the literature shows that the principal has a duty to ensure that s/he fosters the acceptance of group goals to promote cooperation among staff and assist them to integrate ICTs into the curriculum, according to the common goal (Chang *et al.*, 2012). In their studies on the transformational leadership behaviour of school principals, Machado and Chung (2015) conclude that this style of leadership is likely to receive positive support from staff for embedding ICTs into education if the leaders cultivate an interest among followers by inspiring them to go the extra mile. Biggs and Polomska (2013) contend that leaders who employ transformational leadership focus on securing the commitment of teachers towards goal attainment. Principals need to be capable of challenging staff members to re-examine some of their beliefs and attitudes towards their work and to rethink how they can contribute towards school improvement. Printy (2014:8) found that transformational leadership reveals “the extent to which principals challenge teachers intellectually, invited them to innovate, led change, supported teachers and shared power with them”. The integration of aspects of two theoretical models highlighting the transformational influence of principals is regarded as crucial ground work for authentically sharing the work of pedagogical leadership with teachers.

Principals and heads of departments offer formal leadership that encourages staff members to collaborate. Printy (2014: 9) asserts that as “agenda setters”, leaders set direction to ensure goals and expectations were met; as “knowledge brokers” they allow teachers to focus on key pedagogical practices and roles, while being creative and innovative and providing adequate resources. Similarly, as “learning motivators”, leaders built strong personal relationships with staff recognising their efforts and involving them in decision-making. It therefore, suggests that principals play their leadership roles as agenda setters, knowledge brokers and motivators, confirming Ng’s (2015) assertion that they set school visions and model the instructional practices expected in the school system while inspiring staff to perform up to standard.

However, other authors such as Day and Sammons (2013) hold different views on this practice. They argue that helping staff to develop and inspiring a shared sense of purpose while holding high expectations might be an irrational aspiration that

might negatively influence the staff. It is perceived as crucial to build teachers' knowledge and skills, in order to achieve school goals and build their commitment and capacity to excel in teaching. Hallinger and Heck (2012) argue that building capacity and promoting resilience among staff requires a clear understanding of the professional needs of staff. This implies that leaders should listen to staff concerns and provide opportunities for them to learn. Continuous professional development has been suggested as essential to develop human capital within schools (Antoniou, 2013). The literature indicates that leaders who show respect for teachers and concern for their personal feelings and needs are likely to enhance the effective implementation of innovations in their organisations. Other scholars emphasise that principals must have the capacity to trust and empower teachers to be able to build collegial relationships and promote unity among stakeholders working towards ICT integration (Abdullah *et al.*, 2013).

The literature also shows that principals can build trust indirectly through supportive behaviour, although they may not be able to make members trust each other through directive actions (Louis *et al.*, 2014). However, it is argued that principals' respect and individualised concern for teachers, their competence in core responsibilities and personal integrity are linked to establishing trust. Fairman and Mackenzie (2015) and Alkrdem (2015) link the aspect of trust to shared leadership. Contrary to these views, Louis *et al.* (2014) find that most principals do not always trust their teachers, even if trust is perceived as a predictor of how educators interpret their principal's capacity to perform more technical and transformational roles. The scholars argue that trust underpins the emotional and professional relationship between principals and teachers, and teachers and other teachers. This implies that providing individualised support to teachers who integrate ICT into their instructional practice can significantly enhance rapport and the attainment of goals. By offering intellectual stimulation, principals inspire teachers to attain the best results for their students and "to perform their tasks at the highest possible level" (Ng, 2008: 5). Afshari *et al.* (2012a: 165) argue that "in this manner, principals can develop teachers' capacity to aim higher and be more innovative in the incorporation of ICTs in the classroom". School leaders' actions set examples for teachers to emulate but these examples should be linked to the beliefs and values of leaders (Leithwood *et al.*, 2010). Modelling the use of ICTs provides an effective method of exposing teachers to new

strategies and demonstrates to staff that it is acceptable to take risks and learn from mistakes (Afshari *et al.*, 2012b). On the other hand, Mingaine (2013b) and Geijsel *et al.* (2003) point out that the principals should also set high standards by modelling the effective use of ICTs for others to copy. In this case, principals need to be highly knowledgeable and skilled (McLeod, 2015). Warren (2016) proposes that principals must be prepared to serve as a role model and hands-on user of ICTs, based on understanding its capacity for improving the quality of teaching.

Strengthening culture is a critical element of integrating ICTs into the curriculum (Harris *et al.*, 2014). Louis *et al.* (2014) suggest that for effective implementation of reforms, leaders need to set up conducive working contexts that motivate and permit teachers to be committed to their core task of teaching. On the other hand, some authors argue that variations in effectiveness are mainly due to the ability of leaders to build sound interpersonal relationships. Building collaborative structures is also seen as a critical leadership practice for technology leaders in schools. Wang (2015) argues that principals must redefine their roles as leaders to promote a collaborative and supportive relationship with teachers to enhance school improvement. However, the aspects of collaborative and supportive type of relationship can be attained if there is mutual trust among school leaders and their followers as asserted by Harris and Jones (2015). Alenezi (2017a) emphasises that it is crucial for principals to understand that to set up a vision for a school, they have to establish an ICT culture and effective structures within the system. Such principals provide opportunities for teachers to participate in decision making when it affects them or when their skills are needed.

Scholars tend to concur that re-structuring and re-culturing the school system is a requirement for every principal. Leadership should focus on the development of shared norms, values, beliefs and attitudes among teachers. Ng *et al.* (2015) believe that the role of leaders is to enable, facilitate and cause peers to interact in a focused way, and to create a conducive climate for teachers to excel in their ICT integration practices. On the other hand, Tan and Ong (2011) define a school climate as the quality of a school which stimulates teachers' creativity, enthusiasm and sense of belonging, especially the collegial relationships based on an open-door policy by the principal, backed up by clear communication. Leithwood and Sun's (2012) support

for transformational leadership is backed Printy (2014:12) who finds that the most significant measure of principal leadership aligns with aspects of transformational leadership: setting vision, motivating and offering learning opportunities and personal support, while also calling upon instructional leadership in line with school standards and national policies.

### **2.6.3 Pedagogical leadership practices characterising enactment of principals' roles in ICT integration**

Pedagogical leadership practices pertain to the principals' involvement in teachers' instructional activities. Li *et al.* (2016) note that principals observe, counsel and implement professional development initiatives to improve teachers' instructional practices and thus student achievement. Principals often have access to professional training to develop teacher leadership and after devoting time to class visits and analysing documentary evidence to diagnose a teacher's challenges, devise strategies to deal with those challenges and play a role in staff development (Printy 2014: 25). For effective ICT integration and the promotion of a culture of ICT use, principals must observe and attend lessons so they can assess the extent of the integration. Any gaps between policy and practice would be noticed and interventions would be employed, including through guidance and counselling. Figure 15 illustrates the key pedagogical leadership practices summarised from the literature.

### DEFINING SCHOOL MISSION

- Frames school goals
- Communicates clear strategic plans or goals

### MANAGING SCHOOL CURRICULUM

- Coordinates school instructional activities
- Supervises and evaluates instruction
- Monitors staff and learners' progress and performance

### DEVELOPING LEARNING CULTURE

- Protects instructional time
- Provides continuous professional development training
- Provides incentives for staff and learners
- Maintains high visibility

Figure 15: Pedagogical leadership practices enacted in support of ICT integration

Source: Self-illustration adapted from Hallinger *et al.*, 2013.

Defining the values and purposes of the school is said to be the first crucial pedagogical practice. This is followed by managing the teaching programme and the curriculum, supervising and evaluating instruction, coordinating and monitoring student progress and promoting a positive learning climate by protecting instructional time and establishing the school as a professional learning community (Hallinger *et al.*, 2013). Similarly, Ng (2015) and Totolo (2011) affirm that among school related factors, principals' behaviour is crucial in school improvement and in particular, that principals are critical instructional leaders in developing and implementing a vision for ICTs. The literature indicates that expertise is a crucial base for principals' pedagogical leadership practices and their capacity to manage teaching activities, including data analysis for the assessment and evaluation of teacher performance (Printy 2014: 26). Hallinger and Heck (2011a) and Hallinger (2013) argue that the school principal is strategically positioned for modelling, facilitating, monitoring, supporting and linking teachers for coaching and staff development. However, Routledge, Dogan and Almus (2014) and Sun *et al.* (2014) found that competent principals tended to be more directive than collaborative when teachers operate below the necessary level.

Some scholars believe that by using teacher leaders in coaching and facilitating instructional practices, ambiguities emerge regarding roles and authority (Printy 2014:27). However, Razzak (2013a) and Park and Kwon (2013) recommend that principals should become role models by using ICTs for data analysis, school management as well as budgeting and teacher evaluation in order to access data and compile notes during meetings and to communicate with teachers using a variety of ICTs. However, this places demands on principals who need to spend time in classrooms authenticating their pedagogical leadership functions (Haßler *et al.*, 2015). A point to note is that principals and teacher leaders, whether in formal or informal designations, are regarded as leaders based on their knowledge and expertise (Tsakeni and Olaoye, 2016). Such leaders are expected to play pivotal roles in standardising, facilitating, monitoring and evaluating ICT integration across the school. Critical for conversations regarding the best ICT instructional practices can then be initiated around common expectations, strategies and experiences. It is believed that pedagogical, technology content knowledge affects how principals observe classroom practice, offer feedback and structure learning opportunities. Day *et al.* (2010) emphasise that pedagogical leadership for ICTs is best enacted in setting direction and assessment with ICTs. Furthermore, Ottestad (2013) and Razzak (2015) argue that principals should manage expectations with regard to methods, lesson pacing and the amount of time to be used per period, in line with teachers' needs and competencies for effective use of e-tools in their lessons.

The principal is expected to become a resource provider, instructional resource communicator and visible presence (Firmansyah *et al.*, 2014). Thus, the principal is expected to raise awareness of how ICT capabilities can be applied, developed and add value in particular subjects and to analyse opportunities that exist in specific subject areas for developing and applying students' ICT potential. The assessment actions reveal that pedagogical leadership practices focus on the core business of the school: the teaching and learning. Tondeur *et al.* (2012) emphasise the significance of developing an ICT school plan focusing on setting clear goals and defining the means to realise them, assessing and evaluating ICT plans and processes to get a clear picture of the integration of ICTs into key pedagogical practises. Therefore, school leaders are expected to continuously assess the function and usage of ICTs throughout school operations. Wals (2012) and Wei *et al.*

(2017) assert that such assessment would enable the growth of an ICT culture and proposes that principals evaluate staff competencies in their application of ICTs in the classroom and the use of ICTs for student-centred learning. In this regard, the principal acts as a visible presence, being out and around the school, visiting classrooms, attending departmental or form level meetings, walking the hallways and having spontaneous conversations with teachers and learners.

The literature indicates that the ICT culture of a school should encourage teachers to continuously acquire and use ICTs to promote student learning. Principals can also organise open sessions for teachers to display their teaching strategies for their peers. In this way, school leaders can promote the development of communities of practice among teachers, in which they share ideas and resources for embedding ICTs. Price (2014) and Voogt *et al.* (2013b) also found that the role assumed, and practices exercised by a leader are the most powerful factors in integrating ICT reforms in schools. The researchers stressed the important role of principals for managing financial, human and material resources, for building collaboration among teams and as the principal agent for the development of staff capacities. Al harbi (2014) and Afshari *et al.* (2012a) however viewed the most important pedagogical practices enacted by school leaders to be monitoring teachers' activities and performance.

Chigona *et al.* (2010:4), who studied the integration of ICT pedagogy in disadvantaged areas of South Africa, found that when teachers are embedding ICTs for pedagogical practices "they expect their lessons to be completed without any disturbances, be it technical or from power failure". Since teachers are crucial to the success of implementing ICT policy initiatives in schools, authors such as Haßler *et al.* (2016b) argue that school leaders should ensure that teachers have all of the necessary support and arrangements in place when teaching with and through ICTs. Ottestad (2013:10) notes that principals should closely monitor and counsel teachers in terms of their pedagogical practices and needs. The author argues that it is essential to emphasise that instructional leadership should be understood as the link between a principal and a teacher's influence. Louis *et al.* (2014) found that leadership practices and their effects vary across elementary and secondary schools, mainly because of size and institution. The authors observed that principals

in large schools lack time to operate directly with all staff while the complexity of departmental organisation may also limit their influence. Roumell and Salajan (2016) concluded that the pace of ICT adoption in secondary schools in Kenya was very low because of poor IT literacy, lack of e-readiness and insufficient guidelines, a scenario which was also noticed by the African ICT Survey (Kabanda, 2013).

Razzak (2015) and Ottestad (2013) highlight the pressure on principals to support new instructional innovations, such as ICT policy initiatives and contend that there is room for school leaders to enact their practices in support of ICT infusion. Salleh and Laxman (2014:349) share the same view when they echo that, “principals bear the responsibility in developing strategies to ICTs implementation that will encourage teachers to innovate their teaching and students to learn more productively”. It can be understood from the review that school principals have a pivotal role to play in support of ICT integration within schools. Their role involves providing ICT facilities, plans and infrastructure and staff development while incentivising staff to excel in ICT instructional activities. However, researchers have identified other determinants of ICT incorporation, which include using appropriate leadership styles or models as discussed in the previous sections of this study. Leaders recognise teachers’ endeavours and praise them whenever they perform excellently, promoting them as teacher leaders or mentors and perhaps even increasing their salaries. The second kind of support for ICT integration into schools was the moral support and encouragement provided by principals, including staff development workshops, not to mention having computers in classrooms for staff use. Razzak (2015) proposes support for ICT integration might include regular user meetings for sharing ICT related experiences and ideas, feedback on teachers’ ICT implementation through class visits and observations, giving laptops and data projectors on a checkout basis and having downloaded resources available.

## **2.7 Understanding school leadership perspectives and practices in support of ICT integration into education**

Research reveals that beliefs and understandings of teachers and principals tend to shape their classroom practices. This chimes with Cardno and Youngs 's (2013) study findings on the views of principals and teachers regarding mobile computer laboratories (MCL) in public schools in Chile, i.e., that the school principals' beliefs and perspectives influenced their practices. Similarly, Buabeng-Andoh (2015b) and Moore (2016) conducted studies on principals' perspectives on the professional development process, finding that those principals' perspectives and classroom practices were often congruent. Slater (2011) and Tondeur *et al.* (2012) also emphasise the need to comprehend the perspectives and practices of school leaders in enhancing ICT infusion into the schools. It is anticipated that such an understanding of the way principals perceive the use of ICTs in classrooms and how they embed the e-tools within their schools would promote effective integration of ICTs and improve student achievement.

Abdullah *et al.* (2013) and Tshelane (2015) assert that the leadership perspectives of principals determine their practices and conversely, that by analysing principals' practices one can easily establish the perspectives of the principal. From this review of literature, it is possible to identify principals' leadership perspectives in terms of ICT integration into education by analysing their day-to-day practices within their schools. Day and Sammons (2013) argue that the perspectives of school principals tend to overlap in such a way that it becomes challenging to distinguish a specific theory of leadership in action, although some traits of the various leadership theories may still be evident. Table 3 below, illustrates the views of scholars on the associations between leaders' perspectives and their practices.

Table 3: Principals' perspectives and practices compared

| Item | Initiatives                    | Perspectives                                   | Concepts  | Descriptors  |
|------|--------------------------------|--|---|--|
| 1    | Distributed leadership roles   | Distributed leadership<br>.                    | Shared leadership<br>Teacher leaders              | Interaction<br>Autonomy<br>Committees<br>Teacher leaders |
| 2    | Setting direction              | Pedagogical<br>Distributed<br>Transformational | Goals/Strategic plan<br>Vision<br>Strategic plans | Team structures<br>Shared values                         |
| 3    | Managing school ICT curriculum | Pedagogical leadership<br>Transformational     | Goals/Assessment monitoring                       | Supervising/<br>Assessing<br>Evaluating                  |

Source: Adapted from Abdullah *et al.*, (2013)

Waxman *et al.* (2013) argue that the beliefs and perspectives of staff are critical in the implementation of reforms. This study therefore uses these elements to understand principals' perspectives and practices in relation to the distributed, transformational and pedagogical leadership theories. To identify and comprehend the perspectives of the school principal, documentary evidence, observations and interviews might be useful to understand their behaviours and actions. Williams (2015) asserts that it is crucial to study principals' perspectives and practices since an understanding of how they operate is likely to help improve instructional pedagogical practices and student outcomes within the schools.

## 2.8 Gap in literature

This literature review focused on principal leadership and the integration of ICTs in teaching and learning in Zimbabwe. It unveiled significant themes that are crucial to this study. In the first place, I examined local research in the Zimbabwean school context, focusing on the knowledge, perspectives and practices of principals in terms of infusion of technologies within their schools. This was meant to understand how principals' perspectives and practices influence the way they supported teachers'

ICT integration efforts in teaching and learning across the school curriculum. The local and international literature point to the significance of principal leaders in determining the integration of ICTs for teaching and learning within classrooms (Day *et al.*, 2010; Hallinger *et al.*, 2014; Harris *et al.*, 2014; Kabanda, 2013; Leithwood *et al.*, 2010; Spillane *et al.*, 2015). However, little seems to have been researched about how principals enact their roles in support of ICT integration in public schools in Zimbabwe. In addition, the ICT policy framework (Shadreck, 2016) is available for use in schools but there seems to be little material on the roles that school principals play in the infusion of ICTs in public secondary schools in Zimbabwe. Therefore, this study sought to employ different models of leadership to conduct sequential explanatory mixed-methods research examining the roles that school principals play in promoting ICT incorporation into pedagogy. The review of literature was centred on the distributed leadership, transformational leadership and pedagogical leadership perspectives and practices of school principals supporting the integration of the technologies in public secondary schools. The study examined the effectiveness of each of these leadership models in guiding ICT leadership in public secondary schools considering their major tenets, which were discussed in the previous sections of this study.

## **2.9. Summary of the chapter**

The review conducted in this chapter focused on principal leadership and the integration of information and communication technologies for teaching and learning in public secondary schools in Zimbabwe. It provided insights from a body of local and international literature into the roles that school principals play in the integration of ICTs in teaching and learning across the curriculum. Evidence showed that principals are key determinants in the implementation of the national ICT policy within schools and are only second to the classroom practitioners in their impact on learner outcomes. The available literature reveals that school leaders, as ICT leadership, influence learner achievement through defining the ICT mission, setting vision or direction, understanding and developing staff, managing the school ICT curriculum policy, creating a positive learning culture and re-designing the organisation. The review provided a clear focus on the association between school

principals' ICT knowledge, perspectives and practices in support of the ICT integration process for teaching and learning in public secondary schools in Zimbabwe. The literature was also analysed with a focus on how principals enacted their roles to promote and enhance the implementation of the national ICT policy for teaching and learning to improve teachers' pedagogical practices and student outcomes. It was understood that principals' perspectives strongly influence their ICT leadership practices.

The review drew close attention to different theoretical frameworks of principal leadership including distributed, transformational and pedagogical leadership, showing their applicability in studying principal leadership and technology integration within schools. While accepting that pedagogical leadership is viewed as the most significant model to promote high quality education, the review suggests a combination of these approaches. It is therefore concluded that the three different theories of leadership are interwoven and that their combination might be effective in promoting successful integration of ICTs within schools. The next chapter focuses on the research methodology and design used in this inquiry.

### **3. CHAPTER 3: RESEARCH METHODOLOGY**

#### **3.1 Introduction**

Chapter 2 presented a review of related literature and provided different theoretical frameworks for effective ICT leadership, which is particularly ideal for the integration of information and communication technologies (ICTs) for teaching and learning in public schools. The purpose of this chapter is to discuss the research methodology utilised to answer the research questions. Chapter 3 covers the research paradigm, approaches and methods used to carry out the study, guided by the research problem being explored. In a bid to comprehend the roles of the principal with regard to embedding ICTs in schools, the inquiry is guided by the four research sub-questions specified in chapter 1. The main question that provided focus to the study was, “What roles do school principals play in the integration of ICTs for teaching and learning in Zimbabwe’s public secondary schools and how are these roles enacted in practice?”

#### **3.2 The research paradigm guiding the study**

The literature reveals that exploring the knowledge, perspectives and practices of school leaders in the integration of ICTs in the teaching and learning of different subjects across the school curricula is a complex task that requires an appropriate research paradigm and approach. Bryman (2015) proposes that such exploration or investigation should be rooted in quantitative and qualitative epistemology. However, the choice of methodology of the present inquiry was influenced by the personal experiences and/or by the target audience. As recommended by Cameron (2011), I selected approaches that enabled participants to provide their subjective beliefs, knowledge and perspectives on the problem being studied, while on the other hand, guaranteeing the objectivity of the research. In line with these proposals, the current study was premised on pragmatism and rooted in a sequential explanatory mixed-methods research design. These ideas would be further clarified in the following sections. Pragmatism, which is defined by Creswell (2014a: 5) as a “world view”, was useful in directing the study.

Thus, the current research is based on the research paradigm that privileges “what works” in a research context, emphasising the problem being investigated (Allwood, 2012). This allowed me to use all available and relevant approaches to understand and explore the research problem (Tashakkori and Teddlie, 2010). It is further acknowledged that pragmatism opened the door to various forms of data gathering and analysis that I used to maximise the knowledge yield of the research (Buckley, 2015). The integration of positivist and interpretive approaches into one inquiry served the major purpose of highlighting my general philosophy, which is best understood as pragmatism (Feilzer, 2010).

### **3.3 Research design and approach**

I used a mixed methods research design as the best plan, which provided me with the direction within mixed-methods approaches. It was hoped that the use of the mixed-methods design which Creswell (2014b) views as a strategy, comprising the gathering of qualitative and quantitative data, while integrating the two types of data at some point in the research process would help me to understand the research problem more clearly. As argued by Tashakkori and Teddlie (2010) the need for mixed-methods researchers to become methodological “connoisseurs” or specialists, practising what Cameron (2011) identifies as methodological “trilingualism” was considered.

Mixed-methods research, which was regarded by several scholars as a “third wave” which moves beyond paradigm wars, offered a logical and practical alternative to purely qualitative (QUAL) or quantitative (QUAN) research methods (Hall, 2012; Feilzer, 2010; Tashakkori and Teddlie, 2010). Integrating the methods provided a more robust process from which inferences were made, to reduce any uni-method bias and to help me obtain a greater assortment of divergent opinions from the school principals (Subedi, 2016). Based on the belief that all methods have their own strengths and limitations, I collected two kinds of data to offset the limitations of each and strengthen the approach (Cucu and Lenta, 2014). Hence, I ensured that the two forms of data complemented each other and offered the possibility of a more complete analysis.

The use of the mixed-methods approach increased the possibility of achieving research findings that are more trustworthy and relevant when compared to the use of any single approach. This was in line with Frels and Onwuegbuzie (2013) and Subedi (2016), who argue that using mixed methods designs increase validity, reliability, credibility, transferability, dependability and conformability, including prolonged engagement, triangulation, peer debriefing, member checks, thick descriptions, dependability audits and conformability audits. The strategies utilised, reduced possible threats to the integrity of the research quality, especially in qualitative research. Based on this, I realised that by mixing the approaches, the following three benefits including participant enrichment, instrument fidelity and treatment integrity, would accrue.

### **i. Participant enrichment**

Participant enrichment, which is defined by Denzin and Lincoln (2011) as having more informants involved, proved critical in improving the reliability and validity of the research findings. I surveyed 280 participants and interviewed fifteen informants to ensure that more information would be acquired from a large sample. Therefore, the quantitative investigation involved 280 respondents whom I needed for the completion of structured questionnaires while three by five-person open-ended focus group interviews were important to follow up the quantitative results and explain any areas that might be unclear from the first stage of the study. However, the total number of participants remained at 280, as purposive sampling in the qualitative stage drew from the same sample of participants who had completed the questionnaire in the quantitative stage.

### **ii. Instrument fidelity**

I also utilised instrument fidelity, which means maximising the utility of the data collection and research instruments (Buckley, 2015; Denzin and Lincoln, 2011). The structured questionnaires that I sent out to principals served the purpose of soliciting demographic information, their ICT knowledge and their perspectives and practices on ICT integration into schools. The survey data was appropriate for possible generalisation to other principals implementing ICT policies in similar public

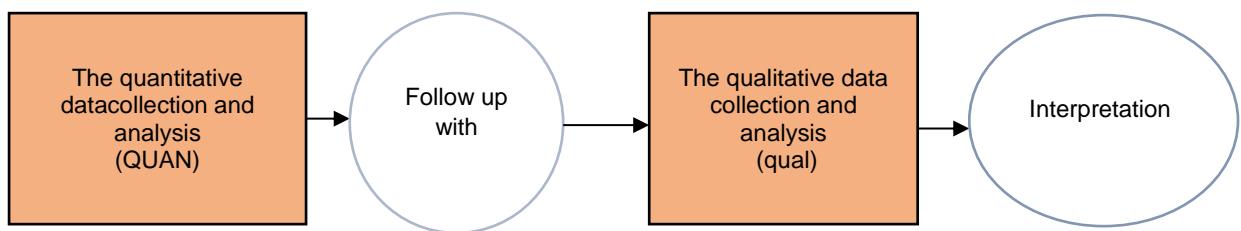
secondary schools. The open-ended focus group interview data served to establish the real voices of the principals in marginalised public secondary schools in Zimbabwe, spelling out their views on how principal leadership roles are enacted and understood in support of ICT integration. I thoroughly analysed ICT related documents to add to the other forms of evidence and to triangulate data sources.

### **iii. Treatment integrity**

I also mixed the qualitative and quantitative methods as well as the data sets at the third stage to assess the effectiveness of the different methods, which I used in the study. This was crucial for improving the validity of the data collected in view of the leadership roles of school principals in implementing programmes such as the ICT reforms being studied. The technique was very useful for inferring the link between principals' ICT knowledge, perspectives, practices and their level of ICT integration into instruction (Saunders, 2015).

I opted for an approach where quantitative survey questionnaires are followed by and integrated with qualitative approaches, including open-ended focus groups and documentary evidence. Any unclear results or outliers from the quantitative research were clarified by the qualitative data. This provided me with a clear understanding of the problem that was being studied (Saunders, 2015). This was in agreement with Bryman and Bell (2015)'s view that a sequential explanatory mixed-methods design is one in which the researcher first carries out quantitative research, examines the results and then follows up on the results to clarify them and elaborate in more detail with qualitative research. The methods are regarded as "sequential" specifically because the first quantitative step was followed by the qualitative step. It was also named "explanatory" because the first quantitative data (survey) results were explained by the qualitative (interview) data. The design was therefore, a two-stage project where in the initial step, I gathered quantitative data, analysed the results and then utilised these results in the second qualitative step. This type of inquiry that I used is a QUANTITATIVE-qualitative, or QUAN-qual, form of procedure for collecting, analysing, interpreting and presenting data, and "mixing" them at some point in a single study to answer the research question (Fetters *et al.*, 2013; Yilmaz, 2013). The way the procedure was used in this research is diagrammatically

presented in Figure 16 below. The illustration shows that more weight was given to the QUANTITATIVE research as opposed to the qualitative research.



*Figure 16: Sequential explanatory mixed-methods design*

Source: Adapted from Creswell (2014:15)

The upper case notation used in “QUAN-qual” indicates that quantitative data analysis and interpretation are more critical than qualitative research shown in lower case, which carries less weight. An initial general survey was used in the quantitative part of the research, focusing on the first two research sub-questions responding to the “what” of principals’ knowledge, perspectives and practices. This was followed by the qualitative inquiry that centred on the use of open-ended interviews to gather more detailed information about principals’ knowledge, perspectives and practices in support of ICT integration in schools. This was meant to answer the last two “how” research sub-questions and to elaborate and explain the quantitative survey results.

I considered the following factors for selecting this type of research design. The major reason for the sequential explanatory mixed-method strategy is to explain quantitative results with qualitative data (Lewis, 2015). This is the most significant procedural reason for adopting the design. The overall intended results are a more in-depth understanding of the quantitative results (Yong and Pearce, 2013). Therefore, I began my study with a large quantitative survey gathering data to answer the first two research sub-questions 1 and 2. As illustrated diagrammatically in Figure 16, the quantitative data is connected at a later stage to data obtained through qualitative interviews. Since this was done sequentially, qualitative data collection could not be carried out before the quantitative data had been obtained and processed, which meant that timing was significant. A sequential strategy was convenient for the study as it could be categorised into two manageable tasks instead of working on multiple data collection and analysis procedures at the same time, which would be difficult for a single researcher (Saunders, 2015). The research

was planned over a specific period, enabling the researcher to concentrate on the first stage and research sub-questions 1 and 2 before attending to the second stage and research sub-questions 3 and 4. Collecting the quantitative data enabled the researcher to identify outliers and residual cases, and to use qualitative data to explore such cases while addressing the remaining research sub-questions 3 and 4. The two data sets were analysed separately in this design; the quantitative results being critical for planning the qualitative follow up. However, Gay *et al.* (2011) argue that one of the most difficult aspects of carrying out a mixed-methods research is the analysis of data, especially when trying to establish points of intersection and discrepancies. This is also important in guiding the second stage sampling procedures and the open-ended qualitative questions (see Appendix B: Documentary evidence). The sequential explanatory mixed-methods design offered general information about the research problem through quantitative survey data while qualitative data provided me with more detailed analysis, particularly through open-ended questions, which helped to refine and explain the general picture of the problem being studied. This type of design required expertise and time to gather quantitative and qualitative data (Archibald, 2016). I had the necessary knowledge and skills developed through research seminars and workshops at the University of the Free State. The SANRAL Chair in Mathematics, Natural Sciences and Technology Education and Dean at the Faculty of Education, UFS, led these.

### **3.4 Quantitative research: Stage 1**

#### **3.4.1 Sample and sampling procedures**

The population consisted of all public secondary school principals in Zimbabwe while the target population for the survey research was all substantive principals employed in public secondary schools of Zimbabwe during the academic years 2010–2016. Within this target population, I purposively sampled 280 school principals (Creative Research System, 2014). I used purposive sampling procedures to obtain information rich sites. Initially, I had planned to estimate, the sample according to Krejcie and Morgan's (1970) formula using stratified sampling procedures to get a representative sample considering the issue of gender balance but after the pilot

study that I conducted I changed after realising that the issue of obtaining gender balance was not as critical as obtaining information rich sites. Furthermore, the number of female principals was too small to make a difference compared to males (ZIMSTAT, 2014). I then employed purposive sampling which helped me to obtain information rich sites where electricity and ICTs could be evident considering the principals who had had some experiences with ICTs for at least five years starting from 2010 up to 2016. This idea is strongly supported by Kumar (2014) who argues that scholars should seek informants whom they feel have suitable information and are willing to share that information. It was on this understanding that 280 principals were chosen as shown in Table 4 below. The percentage of female principals (7.7%) is very small compared to males (92.3%).

Table 4: Principals sampled by gender

| <b>Sample</b> | <b>Questionnaires</b>      | <b>Total</b> | <b>Male</b> | <b>Female</b> |
|---------------|----------------------------|--------------|-------------|---------------|
| Principals    | Distributed questionnaires | 280          | 256         | 24            |
|               | Returned questionnaires    | 260          | 240         | 20            |
|               | Percentage                 | 92.3%        | 92.3%       | 7.7%          |

Source: Survey data

However, the close-ended questionnaires were distributed to 280 principals to offset no-responses. The purposive sampling procedures that I used involved selecting units of analysis in a way that maximised the researcher's ability to respond to the four research questions under study.

### **3. 4. 2 Data collection**

To examine principals' knowledge, perspectives and practices towards the integration of ICTs in teaching and learning in Zimbabwe, I was guided by the reviewed literature to generate a special survey questionnaire instrument.

A questionnaire, which is a written collection of self-report questions, was distributed to 280 participants and was seen as an effective and efficient data gathering tool that required very little time and expertise while allowing gathering of data from a large sample. This was in agreement with Subedi's (2016) advice that survey-based research needs to pay attention to having a sufficient sample and a suitable instrument. For this study, a close-ended questionnaire was chosen as a suitable instrument to gather data pertaining to the first two research questions. Since data were collected from the school principals at a single point in time, September 2016, the design was cross sectional (Creswell and Plano Clark, 2011). Such a stand-alone study was considered effective for providing me with a snapshot of the behaviours, beliefs and perspectives in a population of principals, at the same time as providing data more quickly than a longitudinal survey (Bryman and Bell, 2015).

#### **3.4.3 Preparing the close-ended questionnaire: Pilot study**

The development of the close-ended questionnaire was based on the findings of the literature review related to the research questions. The questionnaire, or survey instrument, consisted of two major sections, Appendix A and B. Section A (items i–viii) captured data concerning characteristics of the schools such as the availability of ICTs, related documents and staff development programmes. This section also captured key demographic characteristics of the principals such as age, gender, number of years of experience as a principal, ICT experience and expertise as well as educational qualifications. Section B was concerned with principals' knowledge, perspectives and practices that characterise their roles in and support for the integration of ICTs in teaching and learning. The questionnaire contained statements

that principals could respond to on a 5-point Likert scale, where 1 referred to strongly disagree and 5 refers to strongly agree. I conducted a pilot study to check and improve the validity and reliability of the questionnaire. Validity determined whether the research truly measured that which it was intended to measure while reliability meant the extent to which the results were consistent over time and if the study could be reproduced under similar conditions (Cronholm and Hjalmarsson, 2011; Gay and Mills, 2015). A pilot study proved to be a useful procedure in which I surveyed 30 principals to pre-test my instrument and adjust the instrument based on feedback from a small group of respondents.

The pilot study was a small-scale replication of the intended study, targeting a small number of participants similar to those of the target population. I constructed the questionnaire with the aid of statisticians at the University of Zimbabwe, Faculty of Education and Department of Educational Management and Research, who then advised me on the validity of the items for statistical purposes. The pilot study sample involved 15 male and 15 female participants who were purposively selected from 30 public secondary schools in Zimbabwe. The pilot study served the purpose of establishing the instrument's suitability and practicability with a view of addressing any limitations, while gauging the amount of time needed for participants to complete the questions. I realised that the questionnaire comprised too many items to be completed within thirty to forty minutes. I then reduced the items to 63 in addition to eight items meant to collect demographic data of the principals. The respondents were asked to indicate ambiguous questions or unclear items that needed revision. The results of the pilot study were analysed with the assistance of University of Zimbabwe statisticians for validity purposes. The findings of the pilot study were utilised to adjust the timings of the objectives of the inquiry and to reconsider the research questions, population and sample. Another strategy that was used to determine the reliability of the questionnaire constructs was the Cronbach's Alpha, which Papaioannou and Charalambous (2011) regard as the most common indicator of internal consistency and reliability of the items in a single assessment. The pilot study produced results that showed that rural day secondary schools lacked ICT facilities and resources while electricity could not be found. This posed a challenge for me to attain the required sample of 280 principals expected for the purpose of this study. As a result, the study focused on public secondary schools in Zimbabwe

including rural and urban schools. It was through pilot studying that I also found that purposive sampling was the ideal technique to get information rich sites compared to stratified sampling techniques. Palinkas *et al.* (2015) view purposeful sampling as the most widely used technique suitable for identifying and selecting information rich cases related to phenomenon of interest. Thus, I did not use stratified sampling techniques which focused on attaining gender balance with regard to male and female participants where female principals proved to be the minority within the Zimbabwean public secondary schools as shown in Table 4 above. I therefore, opted for purposeful sampling to get cases with evidence of ICT infrastructure and resources to enable me to explore principal leadership ICT knowledge, perspectives and practices in support of the integration of technological devices into education.

#### **3.4.4 Reliability and validity of the scale used in this study**

Cronbach's alpha, the most common measure of internal consistency for a study with multiple Likert-scale questions, was used to determine the reliability of the study (Cronbach, 1951). The results displayed in Table 5 below indicate that Cronbach's alpha coefficient ranged from 0.564 to 0.938, showing a sufficient level of reliability and convergent validity of the constructs. Saunders (2015) asserts that the instrument must have a reliability coefficient of at least 0.7 for a strong estimation of its consistency, whereas a coefficient between 0.6 and 0.7 would be acceptable, although some authors suggest that very high values of 0.90–0.95 should be the standard (Bryman and Bell, 2015; Lewis, 2015). Section B was divided into different themes, meant to address the research sub-questions, and the Cronbach's alpha was calculated for each. The results are presented in Table 5 below.

Table 5: Reliability statistics

| Item  | Theme   | Number of items | Cronbach's alpha |
|-------|---|-----------------|------------------|
| 1.A   | Principals' ICT knowledge<br>(items 1–19)                 | 19              | 0.789            |
| B i   | Distributed leadership perspectives<br>(items 20–29)      | 10              | 0.564            |
| B ii  | Transformational leadership perspectives<br>(items 30–38) | 9               | 0.763            |
| B iii | Pedagogical leadership perspective<br>(items 39–50)       | 12              | 0.832            |
| 2     | Practices enacted for ICT integration<br>(items 51–60)    | 10              | 0.938            |

Source: Survey data

Table 5 indicates a Cronbach's alpha coefficient value of 0.564 for section B i, which Tavakol and Dunnick (2011) view as questionable and relatively poor as per the rule of thumb. However, Feilzer (2010) cautions that while a high value for Cronbach's alpha shows good internal consistency of items in the scale, it does not imply that the scale is uni-dimensional. Pallant (2013) clarified that in interpreting a scale's coefficient, it should be realised that a high value is a function of the co-variances among items and the number of items in the analysis. Hence, a high value coefficient is not necessarily in and of itself the mark of a "good" or most reliable set of items. Furthermore, one can just increase the coefficient by increasing the number of items in the analysis, since the larger the number of items the larger the coefficient may be, and the smaller the number of items the smaller it may be. Thus, increasing the number of items may raise the alpha coefficient while introducing redundancy into the scale items. At the same time, a low alpha coefficient might be due to poor inter-relatedness between survey items or the fact that survey items test latent variables such as beliefs and perspectives, which are more difficult to assess reliably and risk being flagged as untrustworthy (Tavakol and Dennick, 2011). Because of this justification, the alpha coefficient of 0.564, which is below the normal threshold of 0.7, was not rejected.

### **3.4.5 Distribution and collection of questionnaire instruments**

To have confidence in generalising the results of the population under research (Cohen, Morrison and Manion, 2017), I used several strategies to distribute and collect questionnaires. With permission from the participating institutions, I obtained contact details of participants from the Educational Management Information System Document (ED 46) and National Association of Secondary Heads (NASH) records collected through the provincial education offices. These documents were crucial since they provided accurate educational details of the participants. This was critical in ensuring good response and return rates. Participants were first contacted through email with a request to participate in the survey on a voluntary basis (Appendix C). Passwords were used to ensure the confidentiality of the responses (Saunders et al., 2015). I emailed questionnaires with a cover letter clarifying the purpose of the study, inviting them to complete the instrument, together with assurances about sponsorship, completion time (30 minutes) and the confidentiality of returns, among others (Creswell, 2014b). The respondents were asked to return the questionnaire by email, fax or any means convenient to them. I used a mailed questionnaire that Tashakkori and Teddlie (2010) define as the most convenient way to reach the geographically depressed off-internet section of the sample. The strategy of mailing the closed-ended questionnaire promoted relatively easy and quick data gathering (Feilzer, 2010) and avoided a situation of having to make actual visits.

To maximise the response rate, I was personally involved in the administration of the instruments. I also sent polite reminders to the participants, who later responded positively, as suggested by Creswell (2014b), without coercing them or demanding their responses. I carried out the processes of cleaning and accounting for missing data using frequency distributions and SPSS version 23. Subedi (2016) defines cleaning the data as a process of inspection of the data for values that are outside the normal range. An extract of some of the responses to questionnaire items that I designed for completion by participants in this study is presented in Table 6 below.

Table 6: An example of a survey instrument used to collect data from respondents

|    | Transformational leadership             | N=2280 | Disagree     | Undecided   | Agree       | Mean | Standard Deviation | Mode        |
|----|---|--------|--------------|-------------|-------------|------|--------------------|-------------|
| 30 | Setting direction                       | 280    | 130<br>50.0% | 43<br>16.5% | 87<br>33.8% | 2.91 | 1.275              | 3<br>Medium |
| 31 | Developing and communication ICT vision | 280    | 138<br>53.1% | 27<br>10.4% | 95<br>36.6% | 3.01 | 2.648              | 4<br>High   |

To motivate participants to complete the questionnaire, I ensured that it was presentable, attractive and would appeal to the senses of the participants (Buckley, 2015).

### 3.5 Data analysis

Data analysis for the two phases was done separately. Figure 17 illustrates the stages involved in the analysis and interpretation of data.

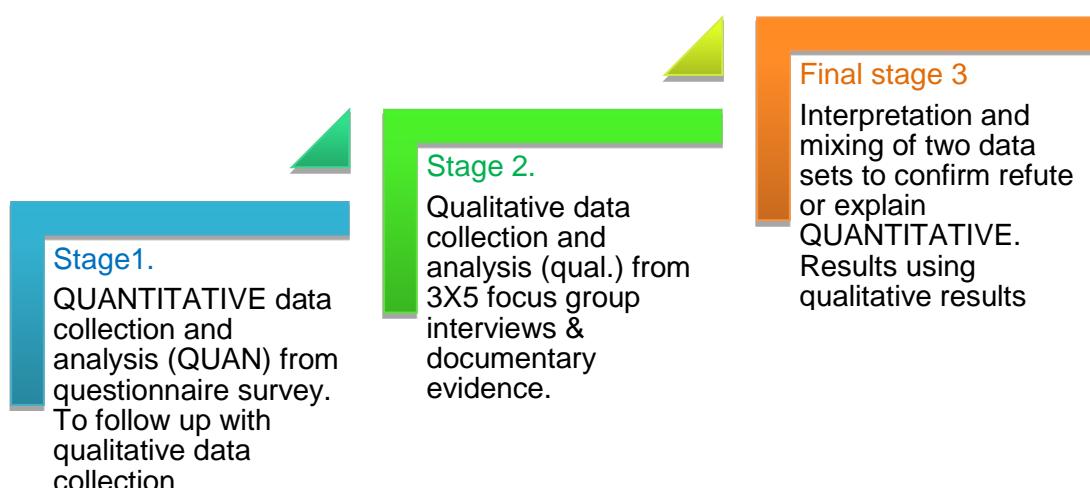


Figure 17: The main stages in the sequential explanatory mixed-methods study

Data interpretation followed the form of reporting the initial quantitative stage results, followed by the qualitative results (Bryman, 2015). A third interpretation recommended by Creswell (2014b) using qualitative data to give a clear picture and

insight into the results of the quantitative research was used. Finally, another discussion followed, specifying the way qualitative results explained the quantitative results (Ritchie and Lewis, 2003).

The quantitative analysis, using SPSS version 23, involved descriptive statistics such as mean, mode, standard deviation, minimum and maximum frequencies and percentages. SPSS version 23 was also used for inferential statistics including factor analysis, Pearson's correlation and paired sample tests to isolate and connect the variables.

### **3.5.1 Factor analysis**

I conducted factor analysis to reduce the number of variables concerning principals' leadership perspectives and practices. Feilzer (2013) describes factor analysis as a multivariate tool that is ideal for data reduction purposes. It therefore clearly represents a set of variables by a smaller number of variables (factors).

#### **i. Principal component method**

The principal component method was important to reduce the number of variables. This method helped me to identify the underlying factors that could account for the total variability in the original variables (Field, 2013). Varimax rotation was also done to ensure that all the original items and variables each had a high loading on only one factor and to find variables that were easier to interpret (Rencher, 2003; Simon, 2011). Factor analysis proved to be quite useful when there were more than eight original items to ensure adequate reduction of duplicated variables. The four factors identified, as seen in Table 7, were:

- F1 (Distributing leadership functions to formal and informal leaders)
- F2 (Involving multiple people in ICT decision making)
- F3 (Giving staff members autonomy to implement the ICT policy independently)
- F4 (Accomplishing leadership functions through interacting with teachers)

Table 7: An example of factor analysis using principal rotation matrix components

| Item | Dimensions   | F1    | F2    | F3    | F4    |
|------|--|-------|-------|-------|-------|
| 20   | Using distributed leadership for sharing digital lesson plans        | -.038 | .692  | .190  | -.129 |
| 21   | Allowing teachers to develop own digital instructional resources     | .457  | 16.2  | .070  | .066  |
| 22   | Learners decide own ICTs for instruction                             | -.014 | .488  | .072  | .067  |
| 23   | Teachers are organised in subject teams                              | -.260 | .187  | -.562 | .297  |
| 24   | ICTs are meant to empower learners                                   | -.091 | .653  | -.048 | -.389 |
| 25   | School leaders facilitate teacher-learner collaboration in ICT plans | -.352 | -.080 | .648  | -.170 |
| 26   | Distributing leadership functions across formal and informal leaders | -.093 | .278  | -.036 | .753  |
| 27   | Involving multiple individuals in decision making on ICT use         | .885  | .000  | .114  | .016  |
| 28   | Giving teachers autonomy to implement ICT initiatives as they wish   | -.146 | .029  | .588  | .502  |
| 29   | Accomplishing leadership functions through interacting with teachers | .891  | .078  | .040  | .087  |

Source: Survey data

The highlighted statistics exceed 0.5 and indicate that the latent variable (questionnaire item) had a high positive influence on the factor. Latent items for which all four factor scores are below 0.5 can be discounted without deleting essential information. The satisfaction index was also calculated to confirm the sufficiency of the latent items when expressed as factors. The satisfaction index was calculated using  $\frac{A_v - |a|}{A - a}$  to ascertain the sufficiency of the latent variables. The satisfaction index has to be high to indicate satisfaction or agreement between variables. If the index were low, it would indicate a lack of significance between the dependent and independent variables. I used the following formula to calculate the satisfaction indexes:

**FA** = Factor analysis, formula provided by Rencher (2003):

$$Av| - |a|$$

---

**Av-a**

Where:

**Av** is the grand average of averages of the latent coefficient for each factor

**| . |** is the modulus of the coefficients of the smallest average of the latent coefficient in each column.

**| A |** is the modulus of the largest average of the latent coefficient (highest) in each column

Each factor was a linear combination of the scores of latent variables (questionnaire items). The general formula for each factor ( $F_1$ ) is given by  $= \sum_{i=1}^p b_i x_i$ .

If  $p$  variables  $X_1, X_2, \dots, X_p$ , measured on a sample of subjects then  $| . |$  can be written as a linear combination of the factors  $F_1, F_2, \dots, F_m$  where  $m < p$ . Thus:

$X_i = a_{i1} F_1 + a_{i2} F_2 + \dots + a_{im} F_m + e_i$  where the  $a_{ij}$ 's, are the factor loading scores and  $e_i$  is part of variable  $X_i$  that cannot be explained by the latent factors. Each factor with a loading of at least 0.5 was deemed to have a major influence on the theme.

### **3.5.2 Paired samples test comparing distributed leadership and ICT integration variables**

Paired samples t-tests were conducted to ascertain the significance of the difference between the means of the dependent and independent variables. This would help explain the extent to which the independent variables (principals' characteristics, their knowledge, perspectives and practices) influenced the dependent variables (ICT use and integration into the curriculum). Table 8 gives a clear picture of how the paired samples t-tests were conducted.

Table 8: Example on paired samples test on principals' distributed leadership and ICTs use

| Distributed leadership perspective variables       | Paired differences |          |            |   |       | T     | Df  | Sig. (2-tailed) |  |  |  |
|--|--------------------|----------|------------|---|-------|-------|-----|-----------------|--|--|--|
|  | Mean               | Std. Dev | Std. Error | 95% Confidence interval of the difference |       |       |     |                 |  |  |  |
|  |                    |          | Mean       | Lower                                     | Upper |       |     |                 |  |  |  |
| Pair Distributed functions – 1 ICTs integration    | .662               | 3.564    | .221       | .226                                      | 1.097 | 2.993 | 260 | .003            |  |  |  |
| Pair Involvement – ICTs 2 integration              | .465               | 1.677    | .104       | .261                                      | .670  | 4.474 | 260 | .000            |  |  |  |
| Pair Autonomy – Accessing & 3 adapting ICTs to all | .546               | 1.695    | .105       | .339                                      | .753  | 5.194 | 260 | .000            |  |  |  |
| Pair Interaction – ICTs 4 training                 | .600               | 1.356    | .084       | .434                                      | .766  | 7.133 | 260 | .000            |  |  |  |

Source: Survey questionnaire

Performing the t-test reveals whether there is a statistically significant difference between the means, in that the difference cannot be explained by chance and is likely to be systemic. In this case, a statistic is significant when the probability of its occurrence by chance is less than 0.05. All pairs shown in Table 8 are statistically significant. Pair 1 is significant at  $p=0.003$ , pair 2 at  $p=0.000$ , pair 3 at  $p=0.000$  and pair 4 also at  $p=0.000$ . The interpretation of the findings is therefore that distributed leadership perspectives influence principals' practices in support of ICT integration into lessons.

### 3.5.3 Pearson's correlation coefficient

The study also calculated Pearson's correlation coefficient to establish the association between factor pairs. Klenke (2016) describes correlation as a quantitative measure of the degree of correspondence of two variables, lying between -1 (strongly negative) and +1 (strongly positive), with correlations close to zero indicating no correspondence. This coefficient was vital in establishing the relationship between independent variables such as principals' demographics, knowledge, perspectives and practices and the dependent variable that was ICT use and integration into education. Table 9 shows examples of how Pearson's correlation coefficient was conducted.

Table 9: Pearson's correlation ( $r$ ) between principals' knowledge and ICT use

| Variables compared                              | Can integrate ICTs into instructional practices | Have enough ICT knowledge and skills            |
|---|---|---|
| Can integrate ICTs into instructional practices |   | $r = .701^{**}$<br>$p$ (2 tail) = .000<br>N=260 |
| Have enough ICTs knowledge and skills           | $r = .701^{**}$<br>$p$ (2 tail) =.000<br>N=260  |   |

Source: Survey questionnaire

From this example, it can be seen that there is a significant and positive relationship ( $r=0.701$ ,  $N=260$ ,  $p=.000$ ) between principals' ICT knowledge and skills on the one hand and ICT integration into instructional practices on the other. The significance is confirmed by the  $p$ -value of 0.000. The correlation of  $r=0.701$  is very strong, confirming that principals' ICT knowledge and skills significantly influence the capacity to use and incorporate the digital devices into instructional practices.

### **3.6 Qualitative research: Stage 2**

The second phase of this sequential explanatory mixed-methods study was meant to provide answers to the “how” type of research questions in the study in order to clearly explain and understand how school principals enacted their ICT leadership practices in support of the integration of ICTs in the school curriculum. The answers to research question 4 provided an understanding of the principals’ perspectives and practices. I used purposive sampling to choose information rich participants. Yin (2014) clearly points out that through purposeful sampling; researchers intentionally choose participants and sites to understand the central phenomenon better. With the assistance of the ICT resource persons and advisors in various provinces and districts nationwide, I purposively selected fifteen principals from the same group of principals who had participated in the first quantitative research stage. The selection of participants was based on the results of the initial quantitative phase of this study, since the major reason for this second stage was to follow up on the first stage and interrogate its findings by using qualitative data (Klenke, 2016). The criteria for selection included background, competency with ICT and the level of success in the integration of ICTs. The provincial ICT resource persons were requested to help with details such as a list of eight successful schools in ICT integration with four female and four male principals, then another group of 7 (four males and three females) from the least successful schools. It was emphasised that schools should have similar characteristics with regard to the socio-economic backgrounds of the learners, funding levels, ICT facilities and all using the same national ICT policy for teaching and learning. I obtained data for this qualitative research through open-ended focus group interviews, document analysis and audio-visual recordings.

#### **3.6.1 Open-ended focus group interviews**

To assess the knowledge and perspectives of principals as well as the practices enacted in support of the integration of the ICTs in teaching and learning, I chose a one hour focus group interview as the most relevant strategy to answer the “how” type of the research questions. An open focus group interview, which is defined by Creswell and Plano-Clark (2011) as a process of gathering information through an interview with a group of people, typically four to six, provided me with the opportunity

to interact with the participants on a face-to-face basis. I also gained more data from their documentary evidence, which they explained in detail during focus group discussions. Similarly, Cooper and Hall (2016) support that focus group interviews are beneficial when interaction and discussion between the participants is likely to bring out extra information, particularly if participants would not otherwise have the opportunity or inclination to release information. I carried out open-ended focus group interviews as suggested by Cooper and Hall (2016). After determining the three groups, each with five participants, I obtained consent, used a flexible plan and interview protocol to guide the conversation and used probes to obtain further details and clarifications (Gay *et al.*, 2011). Participants were first given fifteen minutes to brainstorm answers to some questions and were then asked to give feedback to the group, which included the researcher (Field, 2013). During the interview, I audiotaped the questions and responses and was courteous to participants when the interview was over (Buckley, 2015). The open-ended focus group interview protocol can be seen in Appendix C.

### **3.6.2 Documents**

I gainfully used ICT related documents as important sources of information in qualitative research. According to Yin (2014), documents concern vision and mission statements, values, practices, beliefs and culture. It is in this view that I requested permission to analyse those ICT related documents for the selected participating schools. The documents that I requested included those by bullets represented in Figure 8 below.

## School goals



- Mission
- ICT vision
- ICT strategic plans
- ICT policy documents

## Administrative records



- Assets and inventories
- Minutes of meetings held on ICTs
- Financial records
- Supervision reports

Figure 18 Documentary evidence analysed in the study

Source: Survey data

In line with Creswell *et al.*'s (2014b) argument that documents represent a good source of data for qualitative research and offer the merit of being available in the language and work of the participants who would have carefully prepared those documents, it was easier for me to scrutinise such documents without transcription as required with interviews and observed data. However, the limitations of interrogating documents included the challenge of locating and finding those documents or finding them incomplete or inaccurate. To mitigate this challenge, I had to probe the participants on issues that appeared too vague or incomplete for me to be clear on all the important information I needed about how principals enacted their roles in support of the integration of ICTs for teaching and learning within the schools. Despite these concerns, documents complemented other sources of data and helped me in the triangulation of data. I requested documents that were likely to provide adequate and relevant information concerning practices and beliefs about ICT integration.

### **3.6.3 Audio-visual records**

To further understand the principals' perspectives and practices in support of ICT integration within public secondary schools, I audio recorded information provided by participants, which Creswell *et al.* (2014a) views as key images or sounds that researchers use to assist them to understand the main problem being studied. In this study, these include photographs, video tapes as well as digital images and pictures, which I found to be very useful to augment other data sources and clarify the roles of principals and their support for ICT integration. The advantages of utilising such visual materials were that participants could easily relate to pictures, which were pervasive in schools. As asserted by Bryman and Bell (2015), images offered a chance for participants to share beliefs and perspectives directly, while videotapes and films provided me with a comprehensive record and more information concerning real life as principals visualise it. However, I acknowledged the demerits of these materials, as they required skill and expertise to examine and understand them correctly. To curb this limitation I tried to cross check the accuracy and authenticity of these materials with the aid of official experts in the field.

### **3.7 Data analysis**

I used ICTs to analyse data. Klenke (2016) asserts that a qualitative data analysis computer program stores and organises data according to tags and codes assigned by the user, thereby facilitating searching through data and locating words. I also utilised content analysis and the qualitative data was summarised and presented in thematic form through diagrams, figures and charts. Tracy (2012) posits that when analysing quantitative and qualitative data in a mixed-methods framework, the inquirer works through several steps that include data reduction, display, transformation and correlation, comparison and integration. This study followed the procedures for sequential explanatory mixed-methods research. Mixing data was done at a later stage. Table 10 shows the analytical frame that summarises the entire research process guiding this sequential explanatory mixed-method study.

Table 10: The analytical frame guiding the study

| Research phase | Research question linked to methods/instruments   | Data required  | Participants   | Data collection instruments   | Data analysis techniques  |
|----------------|---|--|--|---|---|
| QUAN-1         | RQn.1. What knowledge and perspectives do school principals have towards ICT integration in teaching and learning across the secondary school curriculum in Zimbabwe? | Demographic data (Qn. i-viii)<br>Principals' ICT knowledge (Qn.1-19)<br>Leadership perspectives (Qn.20-29)<br>See Appendix A | 280 principals   | Structured questionnaire survey on 5-point Likert scale   | Descriptive statistics: mean, mode frequencies, mean, mode standard deviation, Pearson's correlation, SPSS-version 23, factor analysis, paired samples t-tests                              |
| QUAN-2         | RQn.2. What practices characterise the enactment of the roles of principals in support of the integration of ICTs in teaching and learning?                           | Demographic data (Qn. i-viii)<br>Principals' ICT knowledge (Qn.1-19)<br>Leadership perspectives (Qn.20-29)<br>See Appendix A | Same 280 principals as above                               | Structured questionnaire survey on 5-point Likert scale   | Descriptive statistics: frequencies, mean, mode standard deviation, Pearson's correlation, factor analysis, paired samples t-tests y  |
| qual-1         | RQn.3. How do principals enact their practices in support of the integration of ICTs in teaching and learning within schools?   | Enactment of leadership practices to support ICT implementation (Qn.1-7)<br>See Appendix C                                   | Sub-sample (3 groups of 5 principals) drawn from QUAN(15)  | Open-ended focus group interviews<br>Documents  | -Thematic analysis  |
| qual-2         | RQn.4. How can the principals' perspectives and practices in support of the integration of ICTs in Zimbabwean schools be explained and/or understood?                 | Understanding principals' perspectives and practices   | All the participants 280 from survey stage and 15 from FGI | All tools used e.g. Survey questionnaire<br>Open ended focus group interviews<br>Documents & literature | Quantitative and qualitative data analysis techniques as in question 1,2&3Integrating all data sources and methods to get overall results explaining principals' perspectives and practices |

Source: Adapted from Weibel (2011:38)

Research sub-question 4 required the integration of instruments and triangulation of findings from different methods to offer an integrative synthesis of results for this mixed-methods research.

### **3.8 Ensuring validity and reliability**

I used several processes to ensure the validity, reliability, credibility and trustworthiness of the results of this study. Archibald (2016) explains that triangulation is a process of corroboration of evidence from different individuals, types of data, methods of data collection and descriptions and themes, especially in qualitative data. Triangulation is a verification process that I utilised to search for coverage among multiple and different sources of data to identify recurring themes (Bryman, 2015; Saunders, 2012). Throughout the process of data collection and analysis, I ensured that findings and interpretations would be accurate through the triangulation of information. This was achieved by using multiple sources of data, which included survey questionnaires for the generalisation of results, open-ended focus group interviews, documents and audio-visual material, to complement each other (Buckley, 2015). In this manner, additional insights, which could not be acquired from the literature or a single method, were achieved. The development of thick descriptions was also beneficial to the current study. This procedure was concerned with validity, describing the setting, informants and themes of the qualitative study in deep and rich detail (MacMillan and Schumacher, 2010). Thick descriptions enabled principals to articulate their actual words as regularly used, creating statements that reproduce the feelings and perceptions that they experienced. I reported the findings by means of thick descriptions, offering as much detail as possible, enabling the reader to decide on the reliability, credibility and applicability of the findings to similar educational contexts (Field, 2013). Member checking is a process in which the inquirer asks one or more respondents in a study to check their account and it was significant in ensuring the authenticity and accuracy of the findings (Creswell and Plano Clark, 2011).

I also used peer review and found it to be beneficial. Pallant (2013) regards peer review as the review of data and the research process by someone who is familiar

with the research. Peer review is a methodological triangulation technique that increases validity and reliability (Archibald, 2016). The peer reviewer assisted me by asking in-depth questions concerning the approach, methods and interpretations used in order to improve validity and reliability. For the current study, the peer reviewer was involved during data collection and the interpretation of the quantitative and qualitative phases. The peer reviewer was readily able to offer assistance as she is a colleague and lecturer at Great Zimbabwe University, has a PhD from the University of the Free State and has vast experience and knowledge about the subject matter. This was in addition to workshops organised by the SANRAL Chair at the University of the Free State, which equipped me with high-level skills. Finally, the use of the sequential mixed methods approaches in this study provided a further element of inherent methodological triangulation.

### **3.9 Ethical considerations**

The major reason for considering ethics was to keep the participants and researcher in accordance with the best research practice (Buckley, 2015). However, the British Educational Research Association (BERA) (2011) considers that ethics in mixed-methods research do not need to be linked to critical aspects coming from quantitative research. They contend that ethics can rely on the specific mixed-methods design, since different types of designs have their own kinds of ethics that should be anticipated by the inquirer throughout the entire process of the study. As per institutional requirements for conducting research in mixed-methods designs dealing with human participants, I therefore, maintained ethical considerations during the entire research process using the following means:

#### **3.9.1. Permission to carry out the research**

After being issued with an Ethical Clearance Certificate number (**UFS-HSD2016/1013**) by the University of the Free State on 18 August 2016, I sought permission for the research from all participating institutions and individuals. Firstly, written permission was requested from the Ministry of Primary and Secondary

Education, the Permanent Secretary of Education, Provincial Education Directors, District Education Officers and individual authorities in the participating schools (Appendix A-B). This ensured that an acceptable and authentic project was carried out within acceptable standards of research. Formal letters of permission to conduct the research as well as questionnaire interview protocols are provided in Appendices 1, 2, 3, 4 and 5.

### **3.9.2 Confidentiality and privacy**

I maintained confidentiality of information provided by participants by not divulging individuals' private and confidential information thereby utilising the participant's information in a confidential manner. This means all reports given by participants were kept in strict confidence. I assured all participants that their responses would be confidential and that their real names and those of their schools would be dealt with confidentially as well. Table 11 shows pseudonyms and codes that I assigned in place of the real names of the participants. S1 represented school number 1; P1 represented principal number 1, and so on. The second column shows the focus group interview (FGI) number while the third column indicates pseudonyms to keep participants' real names in strict confidence.

Table 11: Principals pseudonyms and codes

| Secondary school | Focus group            | Pseudonyms | Duration |
|------------------|------------------------|------------|----------|
| S1               | One (5 Interviewees)   | P1         | 55.1mins |
| S2               |                        | P2         |          |
| S3               |                        | P3         |          |
| S4               |                        | P4         |          |
| S5               |                        | P5         |          |
| S6               | Two (5 Interviewees)   | P6         | 51.3mins |
| S7               |                        | P7         |          |
| S8               |                        | P8         |          |
| S9               |                        | P9         |          |
| S10              |                        | P10        |          |
| S11              | Three (5 Interviewees) | P11        | 54.5mins |
| S12              |                        | P12        |          |
| S13              |                        | P13        |          |
| S14              |                        | P14        |          |
| S15              |                        | P15        |          |

Source: Interview data

The last column reveals the time I took for the interview session. Similarly, participants' responses were coded and categorised into emerging themes after every question. I also assured the participants regarding the issue of trust and the way I would always avoid deceiving participants in the research process or in the published outcomes. Klenke (2016) stresses that the researcher's perceptions and expectations of participants may influence how they record and report the findings; hence, to militate against this, I used member checks and minimised bias. I established rapport by offering participants the opportunity to comment, while at the same time I kept full control of the focus group discussions to avoid digression. Based on the understanding that ethical reporting and writing research is symbolised by research that is honestly reported, I frankly shared the results with the participants and avoided plagiarism and dishonesty (Creswell, 2014b). In the qualitative second stage of this mixed-methods research, other issues were considered significant, such as explaining the purpose of the study, avoiding deceptive practices while in the field, clarifying the function of the researcher and being truthful and respectful of the research sites(See Interview Protocol, Appendix C).

### **3.9.3. Voluntary participation and informed consent**

I clearly explained the notion of voluntary participation to all participants and they were informed that they had the right to withdraw from the study at any time they wished to do so (Simon, 2011). In addition to the verbal explanations given to the participants, I attached the informed consent sheets to the questionnaire (Appendix 1-5). This measure assured participants of their independence and freedom to participate, to withdraw at any time or to continue participating throughout the planned period (Cameron, 2011).

## **3.10 Summary and conclusion**

This chapter has discussed in detail, the research methodology and strategies that guided the study. The pragmatic paradigm was identified as the worldview in which the study is located. The process of conducting the chosen sequential explanatory mixed-methods design, its relevance to the research and the manner in which it helped me to provide insight into the research questions, were also examined. I also discussed how I conducted the two-stage QUAN-qual project, consisting of a quantitative first stage and a qualitative second stage, showing how validity, reliability, credibility, trustworthiness and confirmability of the results were to be realised.

Descriptive statistical techniques using the mean, standard deviation, mode and frequency counts were demonstrated. Similarly, I illustrated the inferential statistical analyses such as factor analysis; paired sample t-tests and Pearson's correlation coefficient, revealing their usefulness in the study. Ethical considerations and their significance in the research process were also emphasised.

The next chapter focuses on data presentation, analysis and interpretation in order to understand the quantitative and qualitative data obtained from this study.

## **4. CHAPTER 4: DATA PRESENTATION AND INTERPRETATION**

### **4.1. Introduction and chapter overview**

The study aimed at exploring the roles that school principals play in the integration of information and communication technologies (ICTs) for teaching and learning in Zimbabwe. The purpose of this chapter is to present, interpret and analyse the data collected within a period of six months from principals across the country's ten provinces. I used the sequential explanatory mixed-methods research design and analysed the results in two stages, which are the quantitative and then the qualitative phases. The quantitative research focused on the demographic and the Likert scale questionnaires (Appendix A), which I administered to the school principals as the participants. The data collected examined demographic data, ICT knowledge, their perspectives and practices in support of ICT integration into instruction. I analysed using the SPSS version 23, descriptive and inferential statistics such as frequencies, mean, mode and standard deviation, Pearson's correlation coefficient, factor analysis and t-tests in the quantitative stage. I used the results of the quantitative research to purposively select participants for the qualitative research and explain then interpret the findings from the qualitative data (Creswell and Plano-Clark, 2011).

Data from documentary evidence was also presented and analysed (Appendix B, Table 31) before presenting and analysing data from the open-ended focus group interviews, question by question, guided by the themes, sub-themes and categories emerging from the interviews (Appendix C, Table 32). To ensure confidentiality and anonymity, I used pseudonyms and codes for participants and schools in line with the ethical considerations discussed in Chapter 3. The qualitative data served a supportive role of providing a deeper understanding about outliers and unanticipated or critical results from the quantitative data (Subedi, 2016). Finally, I integrated the results of the two data sets with a view of confirming, refuting or replenishing the quantitative results (Cronholm and Hjalmasun, 2011).

## **4.2. Quantitative data analysis and presentation of findings**

### **4.2.1. Descriptive analysis of quantitative data**

A 5-point Likert scale of strongly agree (SA), agree (A), undecided (U), disagree (D) and strongly disagree (SD) was used to present and analyse the quantitative data. Each response was allocated a weighting from 1 to 5 in order to compute the frequencies, means and standard deviations:

| <b>SD</b>           | <b>D</b> | <b>U</b> | <b>A</b> | <b>SA</b>       |
|---------------------|----------|----------|----------|-----------------|
| Lowest scale 1----- | 2-----   | 3-----   | 4-----   | 5 Highest scale |

### **4.2.2. Reliability and validity of the scale used in this study**

Cronbach's alpha coefficient, which is regarded as the most common measure of internal consistency for a study with multiple Likert-scale questions (Tavakol and Dennick, 2011), was used to determine reliability. The results displayed in Table 12 indicate that Cronbach's alpha coefficient ranged from 0.595 to 0.842, revealing a sufficient level of reliability and convergent validity of the constructs. The literature reveals that the instrument must meet the reliability coefficient of at least 0.7 for a strong estimation of its consistency and that an alpha coefficient between 0.6 and 0.7 would be acceptable (Yong and Pearce, 2013) although some authors (Cronbach, 1951; Tavakol and Dennik, 2011) suggest that very high values of 0.90-0.95 should be the norm. Appendix A, Section B of the survey instrument was divided into different themes, Cronbach's alpha being calculated for each of the subscales that were meant to answer the critical questions. The results are presented in Table 12.

Table 12: Reliability statistics

| Item | Theme  | Number of items | Cronbach's alpha |
|------|--|-----------------|------------------|
| 1.A  | Principals' ICT knowledge (items 1–19)                 | 19              | 0.731            |
| Bi   | Distributed leadership perspectives (items 20–29)      | 10              | 0.595            |
| Bii  | Transformational leadership perspectives (items 30–38) | 9               | 0.842            |
| Biii | Pedagogical leadership perspective (item 39–50)        | 12              | 0.734            |
| 2    | Practices enacted for ICT integration (item 51 – 60)   | 10              | 0.738            |

Source: Survey questionnaires

Table 12 indicates a Cronbach's alpha coefficient value of 0.564 for section Bi, which Tavakol and Dunnick (2011) view as questionable and relatively poor as per the rule of thumb. The alpha coefficient of 0.564, which is below the normal threshold of 0.7, was not rejected as explained and justified in chapter 3 section 3.4.4.

#### 4.2.3 Methodological overview

The pragmatic approach that I employed helped me to respond adequately to the four sub-questions by means of a sequential explanatory mixed-methods design that combines quantitative and qualitative research techniques and procedures as well as integrate quantitative and qualitative approaches to bring the necessary methodological triangulation, which could increase validity and reliability (Buckley, 2015). The quantitative approaches were helpful in establishing “what” knowledge and perspectives school principals have and “what” practices characterised the enactment of the principals’ roles in support of the integration of ICTs in teaching and learning. However, the “what” questions were less effective in exploring why and how principals held such perspectives and enacted such practices. Hence, I applied the qualitative approaches to explain the “how” questions, offering rich contextual

data from documentary evidence and open-ended focus group interviews (FGI). Thus, the quantitative (QUAN-) data received high priority over qualitative (qual-) data in the initial analysis, which later provided deeper understandings and elaborations of the results.

Figure 19 depicts an overview of the research methodology, illustrating the main stages, procedures and expected research products. I used the overview of the research methodology as a guide to explore the problem being investigated. The first outer circle in peach colour, represents the first QUANTITATIVE survey stage conducted to obtain the overall views of principals on ICT leadership knowledge, perspectives and practices to enhance ICTs integration into education in the ten provinces of Zimbabwe. The middle grey coloured circle shows the second stage of qualitative research carried out with fifteen interviewees to ascertain their views on the roles which they play in integrating ICTs into the lessons. The last and third stage of this study is shown by a yellow coloured circle where both QUANTITATIVE and qualitative results were integrated to obtain a full picture of the roles which school principals play in the integration of ICTs for teaching and learning within schools.

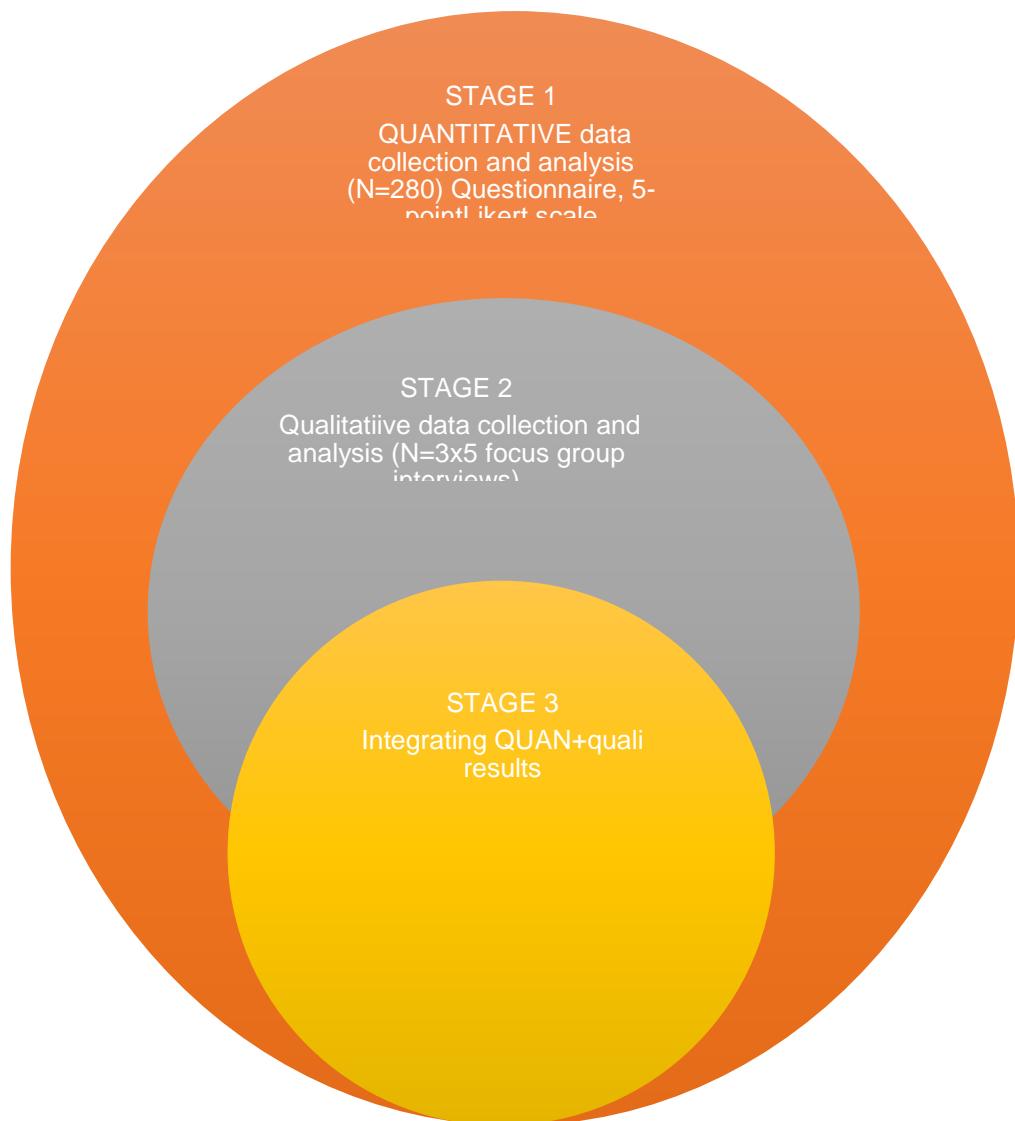


Figure 7: An overview of the research methodology employed in the study

Source: Adapted from Subedi (2016: 574)

#### **4.2.4 Demographic data**

I collected data from the school principals ( $N=280$ ) from Zimbabwe's ten provinces shown in Figure 1 (chapter 1). All participants had served as principals in public secondary schools during the period 2010–2016, suggesting that they had had some experiences with the implementation of the national ICT policy, first introduced in 2005 and revised in 2012 and 2014. Table 13 presents the frequency counts and percentages on eight demographic variables (Appendix A, Section A, Items i-v): gender, age, experience as principal, qualification, experience with ICTs, principals'

ICT expertise, existence of the ICT policy documents within the schools and evidence of staff development programmes for ICT infusion into lessons.

Table 13: Responses on school principals' demographic data

| Demographic features                 | Category                         | Frequency | Percentage |
|--------------------------------------|----------------------------------|-----------|------------|
| Gender                               | Male                             | 240       | 92.3%      |
|                                      | Female                           | 20        | 7.7%       |
| Age                                  | 25–34                            | 8         | 3.1%       |
|                                      | 35–44                            | 126       | 48.5%      |
|                                      | 45–54                            | 110       | 42.3%      |
|                                      | 55–64                            | 16        | 6.2%       |
| Experience as a principal            | 1–5                              | 130       | 50%        |
|                                      | 6–10                             | 76        | 29.2%      |
|                                      | 11–15                            | 52        | 18.6%      |
|                                      | Other                            | 2         | 0.8%       |
| Principals' qualification            | Certificate/Diploma in Education | 115       | 44.2%      |
|                                      | Certified University Graduate    | 144       | 55.4%      |
|                                      | PhD                              | 1         | 0.4%       |
| Principals' experience with ICTs     | 1–5                              | 192       | 73.8%      |
|                                      | 6–10                             | 43        | 15.4%      |
|                                      | 11–15                            | 18        | 6.4%       |
|                                      | 16+                              | 7         | 2.7%       |
| Principals' ICT expertise            | Novice                           | 189       | 72.7%      |
|                                      | Intermediate                     | 54        | 20.8%      |
|                                      | Expert                           | 17        | 6.5%       |
| Existence of ICT policy documents    | Yes                              | 142       | 54.6%      |
|                                      | No                               | 118       | 45.4%      |
| Staff development programmes for ICT | Yes                              | 83        | 31.9%      |
|                                      | No                               | 177       | 68.1%      |

Source: Survey Questionnaires

I used purposive sampling procedures during sampling processes. Table 13 shows that the study sample, as was the population, was dominated by 240 (92.3%) male principals compared to only 20 (7.7%) female principals, highlighting the possible existence of gender disparity with regard to principal positions in public secondary

schools in Zimbabwe. If these results hold out in the population, then it seems like the gender imbalances continue in spite of the efforts by government to have an equitable distribution of leadership positions for males and females through affirmative action and gender based policies (Zimbabwe Government, 1987; National Gender Policy, 2004). The policies provide for a quota system where for every such vacancy, at least a quarter should be occupied by a female (National Gender Policy, 2004:3) “to promote equal opportunities for women and men in decision making in all areas and all levels” The gender divide among school principals points to a great need for government to prioritise redress of the social imbalances. In support of this gender policy, the Public Service Commission disseminated a circular referenced G/46/2004 dated 30 April 2004 to all government sectors including education calling for gender balance in promotional posts but limited changes as shown in this study have been realised.

The highest number of participants fell in the 35-44 age group, which comprises 126 (48.5%) and 45-54 with 110 (42.3%), showing that these are the age ranges when staff would become eligible for headship as seasoned teachers between 35 and 50 years of age (ZIMSTAT survey report, 2012). There were very few principals (6.2%) on the verge of retirement (55-64) or beyond the 64 years age range (0.8%). This is not surprising since the Principal’s Director Policy Circular Number 1 of 2016 stipulates that applicants for principal positions should have a university degree and a teacher training qualification, two years’ experience as senior graduate teachers and substantive positions as deputy heads.

Half of the respondents 130(50%) had less than six years’ experience as principals, 76 (29.2%) had 6-10 years’ experience and almost 20% had 11-15 years’ experience. The sample of participants that participated in this study was therefore, characterised by principals who were relatively less experienced in their principal leadership posts. Yet, when I selected a sample of principals who were in those positions between 2010 and 2016, the assumption was that there would be more between more than five years experienced in these posts to enable them to be conversant with ICT policy implementation.

Most (55.4%) were certified university graduates with at least one degree and a teaching qualification, while the remainder(44.6%) held either a diploma or certificate in education, showing that these schools were being led and managed principals with minimum qualifications in need of university degrees to be able to implement the ICT national policy reforms effectively. However, literature reveals that the issue of the link between one's gender, age and qualification is debatable and insignificant with respect to effectiveness in ICT integration into education (Buabeng-Andoh, 2015; Papainnou and Charalambous, 2011). The study therefore utilised Pearson's correlation coefficients and paired sample tests to test the claims by these scholars about the significance of gender, age and qualification on principals' levels of ICT integration into the classrooms.

More than fifty percent of the principals, 189 (72.7%), lacked ICT competencies and were therefore novices while 54 (20.8%) had basic knowledge of ICT. Thus, most principals were inexperienced and required support to learn about the new technology for education. This observation resonates with the findings by Jita (2016a) on the competence of mentor teachers in schools: that many of them were not adept users of ICTs to be able to coach the pre service teachers to integrate the e-tools into their lessons. The author argues that, "use of ICTs by these teachers depended on their competency levels and their opportunity to learn from their subject methodology lecturers"(Jita, 2016a:158). Therefore, to achieve ICT integration into lessons, school leaders and teachers require knowledge and skills to identify suitable ICTs to support specific curricular goals and priorities and to guide individual professional practices and growth. Therefore, the lack of ICT expertise noted in the study is quite disturbing considering that Zimbabwe's curriculum has placed ICTs as a central theme to be infused for teaching and learning, cutting across the curriculum. (Zimbabwe Government, 2015). The small number of ICT experts 17 (6.5%) is insufficient to fully implement the new ICT policy for education, given that principal leadership is mandated to ensure effective implementation. The literature points to the significance of experience in the effective use of ICTs for instructional purposes (Afshari *et al.*, 2012a) yet, 192 (73.8%) of the principals had limited ICT experience of less than six years, 43 (15.4%) had between 6 and 10 years of ICT experience and only 25 (9.1%) had more than 11 years of experience.

Just over half of the principals, 142 (54.6%), had ready access to the ICT policy documents while 118 (45.4%) did not have ICT policy documents attheir schools. There seems to be a gap between school principals' awareness of their job description documented in the *Provincial Directors' Circular Minutes Number 1 of 2016* and curriculum policy, which stipulates that all principals should secure all educational policy documents and be able to interpret and implement their given guidelines accordingly. The results are contrary to the aims of the New Curriculum Framework (2016), which aimed to develop staff and capacitate educators to superintend ICT implementation (Zimbabwe Government, 2013; Action Plan for 2014 and Beyond, 2014; Second Science Technology and Innovation Policy of Zimbabwe Draft, 2012). The results are consistent with the e-readiness survey findings that showed that most principals did not possess ICT policy documents for curriculum implementation (Farrel and Isaacs, 2011 Kabanda, 2013). Only 83 (31.9%) principals indicated they had staff development programmes for ICT infusion into their classrooms. This suggests that principals are still to prioritise staff development programmes for effective integration of ICTs into classroom instruction. Monitoring and supervision of ICT policy implementation within schools is regarded as essential (Ministry of Primary and Secondary Education, 2016). In the next section of this report, I present the analysis of the data according to the four research questions in this study.

#### **4.3 Responses to research question 1: What knowledge and perspectives do school principals have towards ICT integration in teaching and learning across the secondary school curriculum in Zimbabwe?**

##### **4.3.1 Principals' knowledge with ICTs for teaching and learning**

Table 14 presents school principals' perceptions of the knowledge that they have in the use and integration of ICTs for education, before presenting views on their perspectives. Frequency counts, mean, standard deviation and mode, describing principals' ICT knowledge and skills are illustrated in this table.

Table 14: Principals' ICT knowledge and skills

| No. | Variable   | D            | U         | A            | Mean | Standard deviation | Mode      |
|-----|--|--------------|-----------|--------------|------|--------------------|-----------|
| 1   | Using word processing for teaching                 | 112<br>43.1% | 8<br>3.1% | 140<br>48%   | 3.02 | 1.424              | 4<br>HIGH |
| 2   | Ability to use internet for educational purposes   | 115<br>44.3% | 1<br>4%   | 144<br>55.4% | 3.04 | 1.135              | 4<br>HIGH |
| 3   | Ability to use databases and spreadsheets          | 187<br>71.9% | 4<br>1.5% | 69<br>26.5%  | 2.25 | 1.055              | 2<br>LOW  |
| 4   | Ability to use presentations and emails in lessons | 212<br>81.7% | 3<br>1.2% | 45<br>17.3%  | 2.01 | 1.071              | 2<br>LOW  |
| 5   | Use of websites and WhatsApp                       | 210<br>81.9% | 3<br>1.2% | 43<br>20.2%  | 2.12 | 1.543              | 2<br>LOW  |

Source: Survey questionnaires

The results displayed in Table 14 indicate that the principals had very low levels of ICT knowledge and skills. This is evidenced by the total average mean of 2.289, but with a standard deviation of 1.191 shown in Table 16, which reveals some variations in the participants' views about their ICT knowledge. For instance, responses for items number 1 to 5 depict a generally low level of ICT knowledge and skills other than for elementary ICT applications such as word processing (140 agree; 48%), mean (M) 3.02, standard deviation (SD) 1.424 and mode of 4.

The principals had challenges in using advanced applications for educational purposes as reflected in the above table in items number 1–5. For example, most of them lacked knowledge and skills in using databases (187; 71.9%), Power Point presentations and emails (212; 81.7%) as well as websites and WhatsApp for communication (210; 81.9%) with modes of 2 and very low means (2.25 M, 1.055 S.D); (2.01 M; 1.071 S.D); (2.12 M; 1.543 S.D) respectively.

However, by merely using the means and modes, one would be misled to believe that all the principals agreed on a view. The standard deviation can show variability of responses among the respondents to discriminate between those who agree or disagree on a specific variable. Even if the mean might be high, a high standard deviation implies that the responses vary greatly from the mean, while a low standard deviation means that respondents tend to agree and hold almost similar views on an item. Thus, the use of the standard deviation was meant to cater for the limitations of the average score, which does not give a full picture of the responses

from participants. The low means and high standard deviations show a high variability and differing opinions in the way principals use the digital tools in their pedagogical practices. It therefore implies that while some were highly competent in ICT skills, others were novices in the application of these digital tools for educational purposes. The results are inconsistent with the goals of the Zimbabwe New Curriculum Framework (2016:73), which stipulates that,

All educators should have a range of basic ICT skills, and use the tools to develop, organise and utilise a wide range of basic ICTs relevant to staff and learners within the schools for school improvement.

Similarly, Kabanda (2013) observed that most educators lacked basic ICT knowledge and skills to implement the national ICT policy in schools effectively and spelt out that ICT literacy rates ranged from 5% to 80% in Zimbabwean public schools.

Table 15 shows views of participants on their use of ICTs for curricular issues. Items number 6 to 13 indicates creating a suitable environment for the integration of ICTs into the classrooms by teachers.

Table 15: Creating a positive learning culture for ICT integration (Principals' ICT knowledge)

| No.<br>A | Variable   | D            | U          | A            | Mean | Standard deviation | Mode      |
|----------|--|--------------|------------|--------------|------|--------------------|-----------|
| 6        | Creating a positive learning culture for ICT integration | 131<br>50.3% | 8<br>3.1%  | 121<br>47.6% | 1.99 | 1.300              | 2<br>LOW  |
| 7        | Prepare budgets using ICTs                               | 160<br>62.1% | 3<br>1.2%  | 94<br>36.2%  | 2.52 | 1.216              | 2<br>LOW  |
| 8        | I have received Ministry of Education training in ICTs   | 178<br>68.5% | 9<br>3.5%  | 73<br>28.1%  | 2.32 | 1.227              | 2<br>LOW  |
| 9        | Providing continuous professional development to staff   | 191<br>73%   | 14<br>5.4% | 55<br>21.2%  | 2.15 | 1.181              | 2<br>LOW  |
| 10       | Use of ICTs to manage the school curriculum              | 225<br>86.5% | 4<br>1.5%  | 31<br>11.9%  | 1.74 | 0.050              | 1<br>LOW  |
| 11       | I can use ICT to collaborate with staff and parents      | 237<br>91.1% | 5<br>1.9%  | 18<br>7%     | 1.67 | 0.851              | 1<br>LOW  |
| 12       | Ability to assess situations suitable for ICT use        | 129<br>49.2% | 7<br>2.7%  | 124<br>47.7% | 3.02 | 2.710              | 4<br>HIGH |
| 13       | I can use ICTs for evaluating instruction                | 128<br>49.2% | 14<br>5.4% | 118<br>45.4% | 2.85 | 1.374              | 4<br>HIGH |

Source: Survey data

Participants' responses for items 6 to 9 reveal variations in the way they perceived their capacities to create a positive learning culture for ICT integration within their schools. Almost half of the sample (121; 47.3%) indicated that they could create a conducive learning context for ICT use within their schools (mode=4), although slightly more disagreed (131; 50.3%) in item 6. Well over half (166; 62.1%) could not use websites to prepare school budgets and procure ICT resources for leading and managing the school programmes, with a mean of 2.52 and a high standard deviation of 1.216. Results for items 10 and 11, show very low mode of 1 and a low standard deviation which is less than 1. This shows consensus among participants with respect to their low level use of ICTs for managing the curriculum and collaborating with both parents and students. Yet, policy makers in Zimbabwe had seen it imperative to mobilise adequate resources for the implementation of the ICT national policy through sensitisation and staff development programmes done in phases from September 2012, up to January 2017, for educators, parents and the wider community (Ministry of Primary and Secondary Education, 2011).

However most principals (178; 68.5%) had not received any form of orientation in ICTs by the Ministry of Primary and Secondary Education (2.32 M; 1.227 S.D). Even responses for item 9 show that most principals (191; 73%) could not provide professional development on ICTs to their staff (2.15 M; 1.181 S.D) conflicting with the Zimbabwe National ICT Policy Framework (2016:59). This framework emphasises "the need for continuous professional development of all educators to orient and induct them to the implementation of the new curriculum framework with a bias towards development of science and technological skills within schools and country wide". Gudyanga (2017) has similar views as he studied physical science teachers' perspectives and practices on the new curriculum and found that most teachers lacked content knowledge to teach the subject. Gudyanga's (2017) study suggests the need for re-training of subject specialists to promote their content knowledge. The provision of continuous professional development training for curriculum policy implementers would therefore go a long way towards achieving ICT integration for teaching and learning. The implication is that principals should not wait for workshops facilitated by the Ministry of Primary and Secondary Education for such training (item 8).



Most participants (225; 86.5%) indicated that they did not use ICTs to manage the entire school curriculum, with a small minority (31; 11.9%) using ICTs to manage the curriculum, with a very low mean of 1.74 and low standard deviation of 0.050. Similarly, almost half of the principals (128; 49.2%) with a low mean of 1.67 and 0.857 SD and mode=1, could not utilise ICTs for staff collaboration, students and the wider community during meetings. This is confirmed as most (235; 90.4%) were unable to use websites, WhatsApp and Twitter to communicate with teachers, parents and the wider community for school improvement. Furthermore, Jita (2016a) stated that even when teachers are trained to use ICTs in teacher education programmes, they still seem to face challenges in implementing ICTs in schools during teaching practice due to a lack of ICT tools in schools. Therefore, school leaders need to support them with sufficient ICT infrastructure and resources for effective integration of the digital devices into their classrooms.

Besides using ICTs for collaborating with stakeholders, responses to items 12 show that almost half of the principals (124; 47.7%) could assess situations that were ideal for the use of the technological devices but equally, almost half could not. Responses for item 13 show that almost half of the principals (128; 49.2%) did not assess and supervise teachers' instructional practices using ICTs but with a mode of 4, there were many who could. On the other hand, with a mode of 1 for item 14, the abilities of principals to use ICTs with a view to redesign their institutions were very limited. However, it is important to note that assessment, supervision and evaluation of instruction (item 13) which scored higher, could assist principals to redesign their institutions to meet educational goals and priorities.

Table 16 shows responses of participants on the use of ICTs to manage the school curriculum. Results indicate low use of ICTs by principals to manage the school curriculum (mode for all items 14- 19 below 3). Participants showed lack of ICTs skills to redesign their schools as shown by a low mode (1) and mean of 2.28 though with a high variability of opinions of 1.269, standard deviation (item 14). The mean of 1.71, standard deviation of 0.838 and mode of 1, showed concurrence among

participants (item 15) that they lacked skills and knowledge to communicate with implementers and other stakeholders on issues pertaining to ICT plans.

*Table 16: Use of ICTs to manage the school curriculum (Principals'ICT knowledge continued)*

| No.      | Variable  | D            | U          | A           | Mean  | Standard deviation | Mode     |
|----------|---|--------------|------------|-------------|-------|--------------------|----------|
| 14       | Using ICTs for redesigning my institution                 | 178<br>68.4% | 10<br>3.8% | 72<br>27.6% | 2.28  | 1.269              | 1<br>LOW |
| 15       | Communicating ICT plans with Twitter & emails             | 235<br>90.4% | 7<br>2.7%  | 18<br>10.5% | 1.71  | 0.838              | 1<br>LOW |
| 16       | I have the ability to develop subordinates' ICT skills    | 210<br>80.8% | 12<br>4.6% | 38<br>14.7% | 1.92  | 1.121              | 1<br>LOW |
| 17       | I have enough ICT knowledge to lead educational practices | 208<br>80%   | 2<br>8%    | 50<br>19.2% | 2.04  | 1.128              | 2<br>LOW |
| 18       | I can model ICT use in lessons                            | 206<br>79.2% | 1<br>4%    | 53<br>24%   | 2.12  | 1.058              | 2<br>LOW |
| 19       | I routinely integrate ICTs in education                   | 220<br>84.6% | 11<br>4.2% | 29<br>11.2% | 1.74  | 1.119              | 1<br>LOW |
| Averages |   |              |            |             | 2.289 | 1.191              | LOW      |

Source: Survey data

Responses from items 16 to 19 indicate a general lack of ICT leadership skills among principals (210; 80.8%) to develop staff potential for the effective infusion of ICTs into the classrooms. Only a few (38; 14.7%) indicated that they could capacitate their teachers to embed digital devices into their classrooms. The mean is only 1.92, while the mode is 1. This could be mainly because most of the principals (208; 80%) did not have the ICT skills and knowledge to lead educational practices within their schools (mean 2.04, S.D. 1.121, mode 2). This scenario was linked to the inability of most principals (206; 79.2%) to model the correct ways of integrating ICT into teachers' instructional practices (mean 2.12; S.D. 1.058, mode 2). It is therefore, against this background that most principals (220; 84.6%) did not routinely integrate ICTs into their school curriculum, with only a small proportion (29; 11.2%) who were routinely infusing ICTs into their pedagogical practices (mean 1.74; S.D. 1.119 and mode 1). The results reveal that the successful integration of ICTs to promote learners' digital literacy is a major ongoing challenge within the studied public schools.

Pearson's correlation coefficient was conducted to establish the relationship between school principals' ICT knowledge and their ability to integrate ICTs into their

pedagogical practices. Table 17 presents the output data for the correlation between, “Principals’ ICT knowledge” (independent variable) and their ICT abilities, “Can integrate ICTs into instructional practices” (dependent variable).

Table 17: Pearson’s correlation coefficient between principals’ ICT knowledge and ICT integration

| Characteristics being compared for significances                   | Can integrate ICTs into instructional practices | Have enough ICT knowledge and skills            |
|--|---|---|
| Can integrate ICTs into instructional practices                    |   | $r = .701^{**}$<br>$p$ (2 tail) = .000<br>N=260 |
| Have enough ICT knowledge and skills                               | $r = .701^{**}$<br>$p$ (2 tail) =.000<br>N=260  |   |
| <b>** Correlation is significant at the 0.01 level (2-tailed).</b> |   |   |

Source: Survey questionnaire

Pearson’s correlation coefficient reveals a significant and positive relationship ( $r=0.701$ ,  $N=280$ ,  $p=.000$ ). Correlation is significant at a level of 0.01 (2-tailed). The correlation of  $r=0.701$  is very strong, confirming that principals’ ICT knowledge and skills significantly influencing the capacity to use and incorporate ICTs into their schools.

Similarly, the study found a positive relationship between, “principals’ experience” (independent variable) and their levels of incorporating ICTs into the curriculum (dependent variable) (ICTs are routinely integrated into instructional practices). The output data, showing this association is presented in Table 18, where Pearson’s correlation coefficient indicates a significant link  $r=0.226$ ,  $N=280$ ,  $p$  value=.000.

Table 18: Results of Pearson's correlation between principals' ICT experience and ICT integration

| ICT experience compared to<br>ICT integration                      | ICTs are routinely integrated<br>into instructional practices | Principals' ICT<br>experience in years |
|--|---|--|
| ICTs are routinely integrated<br>into instructional practices      |   | r = 0.226**<br>P (2 tail) .000         |
| ICT experience in years  | r = 0.226**<br>P (2 tail) .000                                |  |
| <b>** Correlation is significant at the 0.01 level (2-tailed).</b> |   |  |

Source: Survey questionnaire

The correlation is significant at a level of 0.01 (2-tailed). Although there is a positive relationship between the two variables, the correlation of  $r=0.226$  is moderate. The findings contradict Wilson *et al.* (2015) who argue that learning about ICTs is similar to asking teachers to hit a moving target because teachers will never have complete knowledge and experience about the available tools since the tools produced for use in education are always developing. Hence, continuous professional development in ICTs is required. The study also utilised Pearson's correlation coefficients between independent variables such as gender, age, qualification and existence of ICT policy documents, and found that most of these demographic characteristics had no significant relationship with the levels of ICT integration into schools. However, when paired t-tests to compare the means of these variables were conducted, different results were obtained as illustrated in Table 19.

Table 19: Paired sample test on significance between principals' gender and ICT use

| Pairs of constructs<br>being compared                | Measures of significance |                |                 |   |       |         | T   | Df   | Sig. (2-tailed) |  |  |  |
|--|--------------------------|----------------|-----------------|---|-------|---------|-----|------|-----------------|--|--|--|
|  | Mean                     | Std. Deviation | Std. Error Mean | 95% Confidence interval of the difference |       |         |     |      |                 |  |  |  |
|  |                          |                |                 | Lower                                     | Upper |         |     |      |                 |  |  |  |
| Pair 1 Gender – Can integrate ICTs                   | -1.046                   | 1.114          | .069            | -1.182                                    | -.910 | -15.142 | 260 | .000 |                 |  |  |  |
| Pair 2 Age in years – Can use databases              | .177                     | 1.318          | .082            | .016                                      | .338  | 2.165   | 260 | .031 |                 |  |  |  |
| Pair 3 Qualification – ICTs are routinely integrated | -.177                    | 1.261          | .078            | -.331                                     | -.023 | -2.262  | 260 | .025 |                 |  |  |  |

Source: Survey questionnaire

Table 19 displays paired sample tests that showed that with a *p*-value of .000, gender was a significant predictor of principals' level of use of ICTs in the classrooms at a 95% confidence interval of the difference. Age and qualification of the principals were not significant predictors at a level of 0.01, of ICT integration into pedagogy as evidenced by their *p*-values of .031 and .025 respectively and this is similar with other studies (Hutton, 2014 Tondeur *et al.*, 2007). These variables were not considered further in this study.

#### 4.3.2 School principals' leadership perspectives

The responses of school principals about their leadership perspectives are depicted in Table 20. The analysis is done in response to survey items numbers 20–60 of the questionnaire, which was divided into categories that are distributed leadership (items 20–29), transformational leadership (items 30–38) and lastly, pedagogical leadership (items 39–50) giving a total of 31 questionnaire items. Thus, the section analyses the participants' responses as per the respective different leadership perspectives presented in table 20 below.

#### 4.3.2.1 Distributed leadership perspectives

The views of school principals on distributed leadership are presented in Table 20 using the mean, standard deviation and mode to obtain a general picture of principals' distributed leadership.

Table 20: Distributed leadership perspectives of principals

| No Bi        | Distributed leadership dimensions                             | D            | U           | A           | Mean | Standard Deviation | Mode        |
|--------------|---|--------------|-------------|-------------|------|--------------------|-------------|
| 20           | Using distributed leadership for sharing digital lesson plans | 138<br>48.1% | 27<br>10.4% | 95<br>30.4% | 2.78 | 1.482              | 3<br>MEDIUM |
| 21           | Allowing teachers to develop own digital resources            | 150<br>57.9% | 14<br>5%    | 95<br>27.7% | 2.98 | 1.472              | 3<br>MEDIUM |
| 22           | Learners decide own ICTs for instruction                      | 181<br>69.6% | 19<br>7.3%  | 60<br>22.7% | 2.20 | 1.262              | 1<br>LOW    |
| 23           | Teachers are organised in subject teams                       | 182<br>70%   | 9<br>3.5%   | 69<br>26.6% | 2.26 | 1.359              | 1<br>LOW    |
| 24           | Empowering teachers through ICTs                              | 195<br>75%   | 5<br>1.9%   | 60<br>23%   | 2.31 | 1.057              | 1<br>LOW    |
| 25           | Facilitating collaboration through ICTs                       | 201<br>77.3% | 13<br>5%    | 45<br>17.3% | 2.02 | 1.438              | 1<br>LOW    |
| 26           | Distributing leadership across formal and informal leaders    | 192<br>73.8% | 12<br>4.6%  | 56<br>21.6% | 2.28 | 1.727              | 1<br>LOW    |
| 27           | Involving multiple individuals in ICT decisions               | 161<br>62%   | 9<br>3.5%   | 90<br>34.6% | 2.51 | 1.770              | 2<br>LOW    |
| 28           | Giving teachers autonomy in ICTs                              | 156<br>60%   | 13<br>5%    | 91<br>35%   | 2.53 | 1.296              | 2<br>LOW    |
| 29           | Accomplishing leadership through teachers                     | 163<br>62.7% | 16<br>6.2%  | 81<br>28.9% | 2.52 | 1.275              | 2<br>LOW    |
| Averages(DL) |   |              |             |             | 2.19 | 1.178              |             |

Source: Survey questionnaire

Generally, the results presented in Table 20 show that the items were rated low, as revealed by the modes of 1–3. Principals in this study held a range of leadership perspectives on ICT integration into education, as seen by the high standard deviations that are above 1. There is great variability among principals' perceptions of allowing teachers to develop their own digital tools for instructional purposes with a mean of 2.78 and mode of 3 but standard deviation of 1.482. This suggests that even if some principals authorise their staff members to freely acquire and produce teaching resources independently, others do not give their staff the opportunity to be resourceful. The responses for items 20–29 indicate that most of the participants did not hold distributed leadership perspectives towards the integration of ICTs for teaching and learning within their schools. This is evidenced by the overall mean of 2.19 for distributed leadership, the modes being low except in items 20 and 21 concerning participants' opinions on sharing and developing digital lesson plans, where opinion was more evenly spread.

Being resourceful is one of those ideals of a good instructor (Ottestad, 2013) that encourages ICTs to be viewed as tools with which teachers and learners can engage. However, responses to items 22 to 29 all indicate over 60% did not use a distributed leadership style to influence their leadership practices in support of the integration of ICTs for teaching and learning. The results are not encouraging when considered alongside the findings of Jita (2010: 853) in South Africa, that more successful schools tended to distribute their work among "teams of leaders such as heads of departments, subject heads, grade leaders and curriculum leaders to promote collaboration and interactions" to contribute to achieving a shared vision and mission for instructional improvement. This suggests that school leaders, who believe in instructional practices developed through teams while empowering learners and staff to use ICT, are likely to embed the tools into classrooms more successfully.

### i. Factor analysis on school principals' perspectives

Factor analysis was conducted to reduce the number of variables concerning principals' leadership perspectives. Pallant (2013) regards factor analysis as a multivariate tool that is ideal for data reduction purposes by representing a set of variables by a smaller number of variables (factors). The satisfaction index was calculated to ascertain the sufficiency of the latent variables (Rencher, 2003; Yong and Pearce, 2013).

$$\begin{aligned} \mathbf{Av} &= -|\mathbf{a}| \\ &= \underline{\quad} \\ \mathbf{Av-a} & \end{aligned}$$

Where **Av**=Grand average of averages of the latent coefficient for each factor and,  $|\cdot|$  = the modulus of the coefficients of the smallest average of the latent coefficient in each column.

$|\mathbf{A}|$  =the modulus of the largest average of the latent coefficient (Highest) in each column.

Each factor (F) was a linear average combination of the variables (questions under a given theme. The general formula for each factor (F1) is given by= $\sum_{i=1}^p b_{xi}$ .

If  $p$  variables  $X_1, X_2, \dots, X_p$ , measure on a sample of subjects then  $|$  can be written as a linear combination of the factors  $F_1, F_2, \dots, F_m$  where  $m < p$ . Thus,  $X_i = a_{i1}F_1 + a_{i2}F_2 + \dots + a_{im}F_m + e_i$  where  $a_{is}$  are the factor loading scores for variable  $|$  and  $e_i$  is part of variable  $X_i$  that cannot be explained by the latent factors. This means for each factor, if the factor loading,  $a_{ii}$  was at least 0.5 then it meant that the respective latent variable had a major influence on the theme.

### ii. Principal component method on principals' perspectives

The principal component method, which identifies factors accounting for the total variability in the original variables, was used to reduce the number of variables (Field, 2013) concerning distributed, transformational and pedagogical leadership

perspectives. Varimax rotation was also done to ensure that all the original items are loaded against one new factor, producing factors that are easier to interpret (Hall, 2012). The results of the factor analysis are presented in Table 21, showing that four components were successfully extracted using SPSS version 23.

Table 21: Factor analysis results on principals' distributed leadership

|    | Distributed leadership perspectives(Variables)                       | F1    | F2    | F3    | F4    |
|----|--|-------|-------|-------|-------|
| 20 | Using distributed leadership for sharing digital lesson plans        | -.038 | .692  | .190  | -.129 |
| 21 | Allowing teachers to develop own digital instructional resources     | .457  | .162  | .070  | .066  |
| 22 | Learners decide own ICTs for instruction                             | -.014 | .488  | .072  | .067  |
| 23 | Teachers are organised in subject teams                              | -.260 | .187  | -.562 | .297  |
| 24 | ICTs are meant to empower learners                                   | -.091 | .653  | -.048 | -.389 |
| 25 | School leaders facilitate teacher-learner collaboration in ICT plans | -.352 | -.080 | .648  | -.170 |
| 26 | Distributing leadership functions across formal and informal leaders | -.093 | .278  | -.036 | .753  |
| 27 | Involving multiple individuals in decision making on ICT use         | .885  | .000  | .114  | .016  |
| 28 | Giving teachers autonomy to implement ICT initiatives as they wish   | -.146 | .029  | .588  | .502  |
| 29 | Accomplishing leadership functions through interacting with teachers | .891  | .078  | .040  | .087  |
|    | Averages   | 1.776 | 1,345 | 1.236 | 1.255 |
|    | Overall mean   |       |       |       | 1.403 |

Source: Survey questionnaire

Four factors were identified for distributed leadership. The shaded cells indicate loadings above 0.5, showing that the item had a high positive influence on the factor. Items with no such loadings can be discounted without losing essential information.

The items have been re-categorised into four factors: F1 (Distributing leadership functions to formal and informal leaders), F2 (Involving multiple people in ICT decision making), F3 (Giving staff members' autonomy to implement ICT policy independently) and F4 (Accomplishing leadership functions through interacting with teachers). Calculating the satisfaction index for results of the factor analysis in Table: 21:

**Av - | a |**

$$\underline{\quad} = \mathbf{1.403-1.236 \ 0.167}$$

**A-a=**

$$\underline{\quad} \mathbf{X \ 100 = 30.92 = 30.9\% = Satisfaction \ Index}$$
$$\mathbf{1.776-1.2360.54}$$

The satisfaction index of 30.9% is low and reflects a negative perception about the distributed leadership perspectives of the school principals towards ICT integration in schools. The index clearly confirms and explains the low average mean of 2.19. However, the average standard deviation of 1.178 is high showing that the principals held varied opinions. These results confirm findings by scholars such as Wang. (2015) as well as Tan and Ong (2011) who also investigated distributed, instructional and transformational leadership perspectives for implementing educational reforms. The findings were that if school leaders employ such different leadership theories, they are likely to be helpful in educational environments as compared to situations when they use a single leadership model(Liljenberg, 2015; Ottestad, 2013: Razzak, 2013). However, this study found little use for distributed leadership. It might therefore be necessary for principals in Zimbabwean public secondary schools to test out those leadership theories for embedding ICTs for instructional purposes. This finding is in line with the sense that secondary schools in Zimbabwe remain in a hierarchical and bureaucratic state, based on chains of command and centralised authority, which does not promote the use of distributed or shared leadership authority. This finding, albeit with regard to the implementation of ICTs in the classroom, may add weight to calls for generalised structural reforms in Zimbabwean public secondary schools.

### **iii Paired samples test comparing distributed leadership and ICT integration**

The results of the paired t-tests, conducted to find the relationship between principals' distributed leadership perspectives and their practices, are presented in Table 22. Four attributes of distributed leadership are compared with the principals' level of ICT use and integration into school.

Table 22: Paired samples test on principals' distributed leadership and ICT use

| Distributed leadership perspective variables                           | Paired differences |                |                 |   |       | T     | df  | Sig. (2-tailed) |  |  |  |
|--|--------------------|----------------|-----------------|---|-------|-------|-----|-----------------|--|--|--|
|  | Mean               | Std. Deviation | Std. Error Mean | 95% Confidence interval of the difference |       |       |     |                 |  |  |  |
|  |                    |                |                 | Lower                                     | Upper |       |     |                 |  |  |  |
| Pair Distributed leadership – 1 ICTs integration                       | .662               | 3.564          | .221            | .226                                      | 1.097 | 2.993 | 260 | .003            |  |  |  |
| Pair Involvement– ICTs 2 integration                                   | .465               | 1.677          | .104            | .261                                      | .670  | 4.474 | 260 | .000            |  |  |  |
| Pair Autonomy to implement 3 ICTs – Accessing and adapting ICTs to all | .546               | 1.695          | .105            | .339                                      | .753  | 5.194 | 260 | .000            |  |  |  |
| Pair Leading through interaction 4 – ICTs training                     | .600               | 1.356          | .084            | .434                                      | .766  | 7.133 | 260 | .000            |  |  |  |

Source: Survey questionnaire

The t-tests reveal a significant difference in the means, which can therefore be explained by the variables. At a significance threshold level of 95% for the differences, pair 1 is significant at  $p=0.003$ , pair 2 at  $p=0.000$ , pair 3,  $p=0.000$  and pair 4 at  $p=0.000$ . The findings indicate that distributed leadership has a significant influence on principals' practices in support of ICT integration into lessons. These results differ from the descriptive quantitative analysis using means, modes and frequent counts in Table 20. The t-test views agree with who found merit in upholding distributed leadership for the implementation of educational reforms.

#### 4.3.2.2 Transformational leadership perspectives

The views of school principals on the transformational leadership perspective are depicted in Table 23. The average mean of 2.81 is moderate while the average standard deviation of 1.608 is high, showing that principals differ in their perceptions.

Table 23: Views of principals on transformational leadership perspectives

| Bii                 | Transformational leadership                           | D            | U           | A           | Mean        | Standard Deviation | Mode          |
|---------------------|---|--------------|-------------|-------------|-------------|--------------------|---------------|
| 30                  | Setting direction                                     | 130<br>50%   | 43<br>16.5% | 87<br>33.8% | 2.91        | 1.275              | 3<br>MEDIUM   |
| 31                  | Developing and communicating ICT vision               | 138<br>53.1% | 27<br>10.4% | 95<br>36.6% | 3.01        | 2.648              | 4<br>HIGH     |
| 32                  | Prioritising development of shared beliefs            | 136<br>50.1% | 28<br>10.8% | 89<br>33.5% | 3.00        | 2.033              | 4<br>HIGH     |
| 33                  | Building consensus among staff about ICT goals        | 149<br>57.3% | 26<br>10%   | 85<br>32.7% | 3.01        | 1.632              | 4<br>HIGH     |
| 34                  | Developing staff                                      | 163<br>62.9% | 13<br>6%    | 82<br>31.6% | 3.11        | 1.306              | 4<br>HIGH     |
| 35                  | Stimulating teachers about ICT integration            | 138<br>48.1% | 27<br>10.4% | 95<br>30.4% | 2.78        | 1.482              | 3<br>MEDIUM   |
| 36                  | Redesigning the organisation                          | 150<br>57.9% | 14<br>5%    | 95<br>27.7% | 2.98        | 1.472              | 3<br>MEDIUM   |
| 37                  | Holding high expectations for teachers                | 181<br>69.6% | 19<br>7.3%  | 60<br>22.7% | 2.20        | 1.262              | 1<br>LOW      |
| 38                  | Building collaborative structures for ICT integration | 182<br>70%   | 9<br>3.5%   | 69<br>26.6% | 2.26        | 1,359              | 2<br>LOW      |
| <b>Averages(TL)</b> |   |              |             |             | <b>2.81</b> | <b>1.608</b>       | <b>MEDIUM</b> |

Source: Survey questionnaire

The study revealed that items 31–34 were rated highly, with a mode of 4 and means of 3.01, 3.00, 3.01 and 3.11 respectively. However, there is high variability of opinions on how principals perceive transformational leadership for the integration of ICT into teaching and learning in their schools, since the standard deviations are also high at 2.648, 2.033, 1.632 and 1.306 respectively. A low level of adoption of transformational leadership is visible in items 37 and 38 with 181 (69.6%) not “holding high expectations about teachers” and a low mean of 2.20, mode of 1 and SD of 1.262. A similar number (182; 70%) did not see “building collaborative structures” as relevant, with a mean of 2.26, mode of 2 and SD of 1.359. Otherwise,

most principals showed a moderately positive perception of the transformational leadership dimensions, although the high standard deviation of above 1 implies that opinions were varied.

While most of the principals preferred the transformational leadership perspective, others held negative feelings about the style. The standard deviations are high for items 31 and 32 indicating some variability among principals about developing and communicating an ICT vision and prioritising the development of shared beliefs.

### **i. Factor analysis on transformational leadership perspectives of principals**

The results of the factor analysis that was done to reduce duplications in the number of factors for transformational leadership are presented in Table 24 below.

Table 24: Results of factor analysis on transformational leadership perspective

|    | Transformational leadership perspectives(Variables)                      | Component |       |       |
|----|--|-----------|-------|-------|
|    |  | F1        | F2    | F3    |
| 30 | Setting direction by developing and communicating a shared ICT vision    | .353      | -.128 | .633  |
| 31 | Developing and communicating a unified shared ICT vision                 | .332      | -.265 | .656  |
| 32 | Giving priority to the development of schools' shared beliefs and values | -.197     | -.132 | .572  |
| 33 | Building consensus about school ICT goals and priorities                 | .037      | .534  | -.058 |
| 34 | Developing staff by providing individualised support to teachers         | .483      | .505  | -.284 |
| 35 | Stimulating teachers to think about their ICT integration practices      | .600      | -.248 | -.085 |
| 36 | Re-designing the organisation by building collaborative structures       | -.189     | .671  | .039  |
| 37 | Holding high performance expectations for teachers and students          | -.554     | .011  | .194  |
| 38 | Building collaborative structures for ICT integration into teaching      | -.177     | -.369 | -.308 |
|    | <b>Averages</b>  | 1.154     | 1.710 | 1.205 |
|    | <b>Overall mean</b>  |           |       | 1.356 |

Source: Survey questionnaire

From the analysis, three out of nine components (items 30, 34 and 36; highlighted in pink) were successfully extracted using the principal component analysis method and then re-grouped into three factors, which are:

F1 (Setting direction, 4 items)

F2 (Developing staff, 4 items) and

F3 (Re-designing the organisation, 1 item).

The satisfaction index was calculated as follows:

$$\frac{Av - |a|}{A-a} = \frac{1.356-1.154}{1.710-1.154} = \frac{0.202}{0.556} \times 100\% = 36.3\% \text{ is the Satisfaction Index}$$

The satisfaction index of 36.3% accounts for variations in the participants' perception of transformational leadership in the infusion of ICTs into instruction. Although the index is higher than distributed leadership, it is still low, revealing that principals' perceptions varied from low to moderate. However, there are glimpses of principals' acceptance of transformational leadership since the average mean score shown in Table 23 is 2.81.

Table 25 shows results of the paired sample tests, which were conducted to compare transformational leadership with participants' level of ICT application into pedagogy. The satisfaction index confirms principals' views in Table 23, which hover around 30% acceptance of transformational leadership.

Table 25: Paired samples test comparing transformational leadership with ICT integration

| Pairs of constructs compared for their significance principals' ICTs use | Paired differences |                |                 |   |       | T     | df  | Sig. (2-tailed) |  |  |  |
|--|--------------------|----------------|-----------------|---|-------|-------|-----|-----------------|--|--|--|
|  | Mean               | Std. Deviation | Std. Error Mean | 95% Confidence interval of the difference |       |       |     |                 |  |  |  |
|  |                    |                |                 |   | Lower |       |     |                 |  |  |  |
| Pair 1 Developing and communicating ICT vision – ICT integration         | .154               | 2.981          | .185            | -.210                                     | .518  | .832  | 260 | .406            |  |  |  |
| Pair 2 Building consensus – ICT routinely integrated                     | .788               | 1.712          | .106            | .579                                      | .998  | 7.425 | 260 | .000            |  |  |  |
| Pair 3 Stimulating teachers – ICT accessible and adapted                 | 1.081              | 2.005          | .124            | .836                                      | 1.326 | 8.691 | 260 | .000            |  |  |  |
| Pair 4 Holding high expectation – can give ICT training                  | 1.088              | 1.987          | .123            | .846                                      | 1.331 | 8.831 | 260 | .000            |  |  |  |

Source: Survey questionnaire

The results in Table 25 reveal that pairs 2, 3 and 4 show significant relationships, ( $p\text{-value}=0.000$ ). The evidence reveals that building consensus goes with ICTs being routinely integrated, that stimulating teachers is connected to ICTs being accessible and adapted and that holding high expectations is related to the provision of ICT training. However, pair 1 shows no significant influence ( $p=0.406$ ) of a shared vision on ICTs. The results support Harris and Jones' (2015) views that transformational leaders should serve as models, offer intellectual support and motivate staff to focus on improving their instructional practices.

### 4.3.2.3 Pedagogical leadership perspectives

The views of principals on pedagogical leadership are presented in Table 26 below and responses generally reveal that the perspective is mostly preferred as compared to either distributed or transformational leadership perspectives since the overall satisfaction index is greater (59.5%).

Table 26: Views of principals on pedagogical leadership perspective

| Biii                  | Pedagogical leadership  | D            | U           | A            | Mean  | S. D  | Level       |
|-----------------------|---|--------------|-------------|--------------|-------|-------|-------------|
| 39                    | Giving individual teachers laptops                                    | 190<br>73%   | 11<br>4.2%  | 59<br>22.7%  | 2.31  | 0.057 | 1<br>LOW    |
| 40                    | Routinely integrating ICTs  | 209<br>80.4% | 10<br>3.8%  | 40<br>15.4%  | 1 .01 | 0.438 | 1<br>LOW    |
| 41                    | ICTs are accessible and adapted to all including special needs groups | 190<br>73.1% | 18<br>6.9%  | 52<br>20%    | 2.13  | 1.020 | 1<br>LOW    |
| 42                    | Defining school mission   | 160<br>61.5% | 11<br>4.2%  | 89<br>34.2%  | 2.51  | 1.670 | 3<br>MEDIUM |
| 43                    | Schedule is organised for ICT lessons                                 | 156<br>60%   | 13<br>5%    | 91<br>35%    | 1.54  | 1.095 | 1<br>LOW    |
| 44                    | Allocating funds for ICT teachers to coach others                     | 165<br>63.4% | 17<br>6.5%  | 78<br>30%    | 2.31  | 1.274 | 1<br>LOW    |
| 45                    | Managing the ICT curriculum   | 71<br>27.3%  | 42<br>16.1% | 147<br>56.3% | 3.71  | .072  | 4<br>HIGH   |
| 46                    | Assessment is done to improve learners' progress                      | 143<br>55%   | 25<br>9.6%  | 92<br>35.4%  | 3.01  | 1.647 | 4<br>HIGH   |
| 47                    | Coordinating and communicating staff progress                         | 136<br>52.3% | 21<br>8.0%  | 88<br>33.8%  | 2.87  | 0.031 | HIGH        |
| 48                    | Providing incentives for using ICTs                                   | 65<br>25%    | 20<br>7.7%  | 175<br>67.3% | 3.01  | 0.632 | 4<br>HIGH   |
| 49                    | Creating a positive learning culture                                  | 132<br>50%   | 10<br>3%    | 118<br>45%   | 2.20  | 0.306 | 3<br>MEDIUM |
| 50                    | Maintaining high visibility   | 137<br>52 %  | 12<br>4.6%  | 111<br>42%   | 3.31  | 1.006 | 4<br>HIGH   |
| <b>Averages(PL)</b>   |   |              |             |              | 2.49  | 1.512 | MEDIUM      |
| <b>Total Averages</b> |   |              |             |              | 2.497 | 1.433 |             |

Source: Survey Questionnaire

The results indicate that generally, principals preferred distributed leadership compared to pedagogical leadership perspectives since there is a moderate average mean of 2.497, despite a high standard deviation of 1.512. Results from items 45–48 and 50, have high agreements with the statements ranging from 33.8% to 67.3%

while the mean scores are between 2.87 and 3.71 and the modes are 4. Most (67.3%) principals believe in motivating staff by providing incentives for integrating ICTs into instruction, 56.3% show a willingness to manage the ICT curriculum and 42% indicate high visibility in supervising and monitoring the implementation of the ICT national policy. More than 30% agreed that it was their responsibility to assess instructional practices, to coordinate and communicate staff and learners' progress and to provide reinforcement for further improvements. Such principals are facilitators, supervisors, coordinators and instructional leaders, conscious of the need to improve instructional practices and student achievement. The results are consistent with Ottestad (2013:119) that ICT implementation was effective where principals were conscious of their leadership roles to promote "ICT for planning, developing and sharing teaching practice where student-centred pedagogy prevails and leadership actions are systematically to foster digital competence among staff". This view also agrees with the notion of a positive learning culture, with 45% agreeing on item 49 that they should create a positive learning culture for the effective implementation of school curriculum policies and provide incentives for staff integrating ICTs into their classrooms.

However, there were low levels of acceptance among participants concerning items 39 to 44 regarding the provision of laptops to individual teachers, ICTs to all groups including those with special needs and funds for mentor teachers. The survey responses reveal that most of the principals do not agree, with low modes of 1 or 2 and low means between 1.01 and 2.31. The results from interviews, documentary evidence and survey questionnaires suggest that principals and staff members do not interact collaboratively to improve instruction by setting a common vision to manage the ICT curriculum as teams. The school principals offer guidelines as agenda setters, knowledge brokers and learning motivators (Printy, 2014).

In terms of the practice of giving a laptop to every teacher, results show that teachers are not given individual laptops to use in their classrooms (2.13 mean and .990, standard deviation) which means that principals are fairly unified on this view. The results are consistent with Bukaliya and Mubika (2011) regarding the challenges facing secondary schools in utilising the gains of ICTs for education in Zimbabwe,

mainly because the lack of resources impeded the issuance of laptops to individual teachers and learners.

### **i. Factor analysis for to extract main variables on pedagogical leadership**

The results of the factor analysis conducted to extract major factors concerning pedagogical leadership perspectives are illustrated in Table 27 below. Out of twelve variables, seven were successfully selected as critical to explain the theme. The selected factors comprised of F1 (Defining school mission, 6 items), F2 (Allocating funds, 2 items), F3 (Managing the ICT curriculum, 2 items), F4 (Coordinating and communicating staff progress, 3 items), F5 (Providing incentives for using ICTs in lessons, 2 items), F6 (Creating a positive learning culture, 5 items) and F7 (Maintaining high visibility, 1 item). Table 27 represents factor analysis results on principals' views about pedagogical leadership practices, survey items number 39 to 50. F1 up to F7 are selected components constituting the key factors about pedagogical leadership enacted by principals in support of ICT infusion within their schools.

Table 27: Factor analysis on principals' views about pedagogical leadership

|                      |   | Component   |             |            |              |             |             |             |
|----------------------|---|-------------|-------------|------------|--------------|-------------|-------------|-------------|
|                      |   | F1          | F2          | F3         | F4           | F5          | F6          | F7          |
| 39                   | Giving individual teachers a laptop, training and time  | .634        | -.150       | -.142      | -.114        | .082        | .061        | .062        |
| 40                   | Routinely integrating ICTs into instructional practices | .055        | .141        | -.071      | .689         | .013        | .130        | -.022       |
| 41                   | Adapting ICTs for all, incl. those with special needs   | .304        | .112        | -.535      | .033         | .114        | .175        | .188        |
| 42                   | Defining school mission                                 | .060        | .043        | -.015      | .443         | .659        | .160        | -.020       |
| 43                   | Time to allow teachers to develop digital lesson plans  | -.541       | -.076       | .073       | -.022        | .159        | .026        | .412        |
| 44                   | Allocating funds for ICT-capable teachers to coach      | .219        | .527        | -.060      | -.043        | .107        | .100        | .320        |
| 45                   | Managing the ICT curriculum                             | .235        | .175        | .268       | -.048        | .180        | -.741       | .084        |
| 46                   | Assessment is done to improve learner performance       | .528        | -.012       | .345       | .158         | -.218       | -.085       | .050        |
| 47                   | Coordinating and communicating staff progress           | .048        | .019        | .803       | .006         | .041        | .109        | .004        |
| 48                   | Providing incentives for using ICTs in lessons          | .284        | -.584       | -.116      | -.104        | .121        | -.043       | -.208       |
| 49                   | Creating a positive learning culture                    | -.074       | .720        | -.098      | -.060        | -.024       | -.074       | -.301       |
| 50                   | Maintaining high visibility                             | -.014       | .052        | -.097      | .021         | -.056       | -.020       | .808        |
| <b>Average</b>       |   | <b>.440</b> | <b>.610</b> | <b>669</b> | <b>..689</b> | <b>.659</b> | <b>.741</b> | <b>.808</b> |
| <b>Total average</b> |   |             |             |            |              |             |             | <b>.659</b> |

Extraction method: Principal component analysis

Rotation method: Varimax with Kaiser normalisation.

a. Rotation converged in 14 iterations.

Source: Survey Questionnaire

**Index** was calculated as follows:

$$\text{Av} - |a| = .659 - .44$$

$$= 0.219$$

$$\frac{\text{Av} - |a|}{\text{A}-a} = \frac{0.219}{0.808 - 0.44} = 0.219 \times 100\% = 59.5\% \text{ is the Satisfaction Index}$$

$$\text{A}-a = 0.808 - 0.44 = 0.368$$

The satisfaction index is above average indicating the high level of acceptance of pedagogical leadership perspectives among principals. This revealed that this leadership style was the most prevalent. Shadreck (2016), who studied practices

among school leaders in Zimbabwe, found similar results, discovering that most educators preferred top-down approaches to leadership, which most closely resemble the instructional leadership style. Table 28 presents the views of participants on the effects of applying the pedagogical leadership approach to ICT integration within the schools.

Table 28: Paired samples test on pedagogical leadership and ICT use

| Pairs of constructs compared to<br>ICT use within classrooms | Paired differences |                   |                       |  |       | T      | Df  | Sig. (2-tailed) |  |  |  |
|--|--------------------|-------------------|-----------------------|--|-------|--------|-----|-----------------|--|--|--|
|  | Mean               | Std.<br>Deviation | Std.<br>Error<br>Mean | 95%<br>Confidence<br>interval of the<br>difference |       |        |     |                 |  |  |  |
|  |                    |                   |                       |  | Lower |        |     |                 |  |  |  |
| Pair ICT schedule is organised –<br>1 can integrate ICTs     | .615               | 1.657             | .103                  | .413   | .818  | 5.987  | 260 | .000            |  |  |  |
| Pair Assessment and<br>2 evaluation– ICTs are<br>integrated  | 1.373              | 1.689             | .105                  | 1.167  | 1.579 | 13.109 | 260 | .000            |  |  |  |
| Pair Coordinating staff progress<br>3 – ICTs are accessible  | 1.746              | 1.586             | .098                  | 1.553  | 1.940 | 17.756 | 260 | .000            |  |  |  |
| Pair Allocating funds – can give<br>4 teachers ICT training  | 1.404              | 1.575             | .098                  | 1.211  | 1.596 | 14.371 | 260 | .000            |  |  |  |
| Pair Providing incentives –<br>5 access to ICT resources     | .565               | 4.374             | .271                  | .031   | 1.100 | 2.084  | 260 | .038            |  |  |  |

Source: Survey questionnaire

The paired samples t-tests show that scheduling time for ICT lessons, assessment and evaluation of instructional practices, coordinating and communicating staff progress and allocating funds in support of the use of technologies all have a significant influence on educators' access to, use and infusion of ICT into pedagogy. This is shown by the p-values of 0000. However, provision of incentives did not influence access to ICTs, the p-value of .038 not being significant. The results are in line with the Zimbabwe Government (2014b) *Secretary' Policy Circular No. 1 of 2014* which cancelled and banned the issuing of incentives to educators in public schools. This study also found that principals know that assessment with ICTs is specifically meant for improvement of student performance and that the incentives, especially of

monetary value, should not be given to teachers. The directives by the Ministry of Primary and Secondary Education are meant to ensure that schools use the national ICT policy for education, following the prescribed curriculum policy that principals are mandated to interpret, facilitate and control the implementation of guidelines issued from the national centre (Zimbabwe Government, 2014a, National ICT Syllabuses, 2017). The findings are also consistent with Hallinger and Lee (2012) that the role of the leaders is to enable, facilitate and cause peers to interact in a focused manner to ensure that the curriculum policy proposals are properly implemented as directed without deviation.

**4.4 Responses to research question 2: What practices characterise the enactment of their roles in support of the integration of ICTs for teaching and learning?**

The views of the principals on the practices that characterise the enactment of their roles in support of the integration of ICTs into education are presented in Table 29. The table reveals the key roles enacted by school principals in support of the infusion of ICTs within their school contexts.

*Table 29: Responses on principals' leadership practices in support of ICT integration*

| No | Principals' leadership perspectives                                  | Mode | Mean        | Std. Deviation |
|----|--|------|-------------|----------------|
| 2  | <b>Distributed leadership practices</b>                              |      |             |                |
| 51 | Distributing leadership functions across formal and informal leaders | 1    | 2.15        | 1.993          |
| 52 | Involving multiple individuals in ICT decision making processes      | 1    | 2.31        | 1.184          |
| 53 | Accomplishing leadership tasks through interacting with teachers     | 2    | 2.45        | 1.691          |
| 54 | Giving teachers autonomy to implement the ICT policy as they wish    | 1    | 2.20        | 1.262          |
|    | <b>Averages (DL)</b>   |      | <b>2.28</b> | <b>1.533</b>   |
| 2  | <b>Transformational leadership practices</b>                         |      |             |                |
| 55 | Setting direction  | 1    | 1.74        | 1.119          |
| 56 | Developing staff   | 4    | 3.79        | 1.023          |
| 57 | Redesigning organisation   | 3    | 2.48        | 1.094          |
|    | <b>Averages (TL)</b>   |      | <b>2.67</b> | <b>1.079</b>   |
| 2  | <b>Pedagogical leadership practices</b>                              |      |             |                |
| 58 | Defining school mission  | 2    | 2.35        | 1.289          |
| 59 | Managing the school ICT curriculum                                   | 4    | 4.16        | 0.699          |
| 60 | Creating a positive learning culture                                 | 4    | 3.60        | 0.020          |
|    | <b>Averages (PL)</b>   |      | <b>3.37</b> | <b>0.669</b>   |
|    | <b>OVERALL AVERAGES</b>  |      | <b>2.72</b> | <b>1.137</b>   |

The responses on leadership practices enacted by principals in support of ICT integration are summarised in Table 29. The general story told by the statistics is that many items have a high mode of 4 and means above 3, while a few have a low mode of 1 and means below 3. In most cases, the responses reveal a high variability, as shown by high standard deviations above 1. The total averages for all the practices based on distributed, transformational and pedagogical leadership show moderate agreement with a mean of 2.72 and a standard deviation of 1.137. Further analysis of these responses is developed separately according to each leadership style, to establish the extent to which principals enact practices associated with each style.

#### **4.4.1 Distributed leadership practices**

Items 51 to 54 constitute distributed leadership practices characterising the way principals enacted their responsibilities to promote the incorporation of ICTs. The results indicate, with means below 3 and modes of only 1 or 2, that most principals made limited use of distributed leadership styles. With an average mean of 2.28 and an average standard deviation of 1.533, it is also evident that there was a range in terms of the extent to which principals enacted distributed leadership practices.

The responses to item 51 to 54 indicate that the distribution of leadership functions across formal and informal leaders was rare (mean 2.15, SD 1.99, mode 1). The involvement of staff members in decision-making processes was often minimal (mean 2.31, SD 1.184 and mode 1), interaction with staff was variable but could be improved (mean 2.45, SD 1.691 and mode 2) and the development of teacher leadership was also low (mean 2.20, SD 1.262 and mode 1). Overall, the results show that the use of distributed leadership practices in Zimbabwean public schools was limited. Principals seemed to be unwilling or unable to encourage, for example, teacher leadership (Harris *et al.*, 2014; Day and Sammons, 2013). One barrier to the development of teacher leaders might be the top-down leadership model that still pervades in public schools in Zimbabwe. Harris *et al.* (2014) contend that the development of teacher leaders depends on the willingness of school administrators to relinquish power and authority to teachers, as well as the level to which teachers accept the influence of their peers. Therefore, the effective empowerment and involvement of staff in decision-making requires structural and organisational change and the distribution of power and authority across formal and informal leaders.

#### **4.4.2 Transformational leadership practices**

The responses to items 55, 56 and 57 concern how principals enact their leadership practices in terms of transformational leadership. The average mean of 2.67 and SD of 1.079 suggest that principals used a transformational leadership style to some extent to execute their responsibility for the implementation of ICT policy, although variations exist. Items 56 and 57 reveal moderate application of a transformational leadership style, especially in developing staff members (3.79 mean, SD1.03, mode

4) and redesigning systems (2.48 mean, SD 1.094, mode 3). However, item 55 reveals that many principals did not set direction to guide staff in implementing the ICT policy proposals (mean 1.74, SD 1.119, mode 1). The results suggest that principals had challenges in framing mission and vision statements in order to guide staff, despite the significance of the visionary and inspirational tenets of transformational leadership and the charismatic role of principals to instil teamwork, a unified shared vision and collaboration (Ottestad, 2013; Razzak, 2015). The results of this study suggest the need for school leaders to work towards staff consensus on goals and priorities, communicating them to all stakeholders and establishing a strong sense of purpose.

#### **4.4.3 Pedagogical leadership practices**

The results for items 58, 59 and 60 reveal that principals were performing their instructional leadership responsibilities guided by pedagogical leadership perspectives, as revealed by high modes, an average mean of 3.37 and a relatively small standard deviation of 0.669. Principals had a high awareness of their roles and responsibilities in managing the school ICT curriculum (mean 4.16, SD 0.699, mode 4) and in creating a positive learning environment (mean 3.60, SD 0.020, mode 4), which showed almost unanimity among principals. Results correlate with Murphy *et al.*'s (2013) views that pedagogical leadership guides principals in their work.

##### **i. Paired sample test on leadership practices and level of ICT use**

The results of the paired sample t-test conducted to establish the relationship between principals' leadership practices and their level of ICT use and integration into lessons are presented in Table 30 below.

Table 30: Results of paired sample t-test on leadership practices and level of ICT use

| Three pairs of characteristics compared for their significances in ICT integration | Paired Differences |                |                 |   |       | T      | df  | Sig. (2-tailed) |  |  |  |
|--|--------------------|----------------|-----------------|---|-------|--------|-----|-----------------|--|--|--|
|  | Mean               | Std. Deviation | Std. Error Mean | 95% Confidence interval of the difference |       |        |     |                 |  |  |  |
|  |                    |                |                 |   | Lower |        |     |                 |  |  |  |
| Pair integrate ICTs – Involvement 1  | -.081              | 1.673          | .104            | -.285                                     | .124  | -.778  | 259 | .437            |  |  |  |
| Pair ICTs are routinely integrated 2 – I build consensus                           | -.788              | 1.712          | .106            | -.998                                     | -.579 | -7.425 | 259 | .000            |  |  |  |
| Pair Can use ICTs for 3 assessment & supervision – Provide CPD                     | .700               | 1.906          | .118            | .467                                      | .933  | 5.923  | 259 | .000            |  |  |  |

Source: Survey questionnaire

Pair 1 compared the extent to which principals' involvement of staff in decision-making influenced the level of use of ICTs in classrooms. The results indicate that involvement did not have a noteworthy impact on ICT use since the p-value is not significant. However, pairs 2 and 3 concerning the links between ICT use and building consensus among staff, and the provision of Continuous Professional Development (CPD) showed significant relationships with p-values that indicated effectively zero chance of these results occurring at random. The results show that it seems to be important for principals to engage with staff and to build consensus to support the effective integration of ICT into teaching and learning. The results also suggest that principals should utilise in-service training to encourage and support the use of ICTs. The findings corroborate those of Schrum *et al.* (2015) that the amount of training that principals and teachers receive can make a positive difference and that school leaders should utilise continuous professional development to enable the successful integration of ICTs into teaching and learning practices.

## **4.5 Qualitative data presentation**

The data collected through open-ended focus group interviews and documentary analysis was meant to respond to the last two research sub-questions on the “how” part of the study, which could not be adequately addressed by means of quantitative approaches. As illustrated in Table 10, the analytical framework for the study, the quantitative research dealt with the “what” part of the research questions, which specifically focused on the knowledge, perspectives and practices that characterised the enactment of principals’ roles in support of ICT integration for teaching and learning.

The 15 participants who volunteered to participate in the open-ended focus group interviews were given a full explanation regarding the purpose of the study and associated ethical issues. They were assured of confidentiality, privacy and the anonymity of their own names and of their institutions. Consent forms were also completed, to meet the ethical considerations spelt out in Chapter 3. Pseudonyms and codes were assigned, as illustrated in Table 10 of chapter 3.

Prior to the interview dates, the participants were requested to bring documentary evidence of their ICT availabilities, which were also going to be utilised for discussions to ascertain the levels at which the schools were equipped (hardware, software and network connectivity). This data enabled the researcher to understand the actual ICT integration situation from their ICT records and availabilities. Table 31 presents the participants’ demographics and technological availabilities.

### **4.5.1 Participants’ demographics and technological availabilities**

Table 31 shows the participants’ demographics and their technological availabilities. The demographics of the interviews included their gender, age, experience as principals, their ICT policy, staff development programmes, ICT budgets and others numbered up to twenty in the table. Information from these documents provided

evidence of the extent to which the principals actually integrate ICTs into their schools.

*Table 31: Informants' demographics and their ICT availabilities*

| No | Item                   | P<br>1 | P<br>2 | P<br>3 | P<br>4 | P<br>5 | P<br>6 | P<br>7 | P<br>8 | P<br>9 | P<br>10 | P<br>11 | P<br>12 | P<br>13 | P<br>14 | P<br>15 | N  | %  |
|----|------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|----|----|
| 1  | Gender                 | M      | F      | M      | M      | M      | M      | M      | F      | M      | M       | M       | M       | M       | M       | F       |    |    |
| 2  | Age                    | 42     | 56     | 40     | 39     | 48     | 60     | 48     | 47     | 51     | 46      | 50      | 61      | 59      | 55      | 49      |    |    |
| 3  | Principals' experience | 4      | 12     | 6      | 6      | 9      | 15     | 10     | 11     | 13     | 6       | 12      | 21      | 11      | 17      | 8       |    |    |
| 4  | ICT policy             | X      |        | X      | X      |        | X      | X      |        | X      | X       | X       |         | X       |         | 9       | 60 |    |
| 5  | Staff development      | X      |        | X      |        | X      |        |        | X      | X      |         | X       | X       |         | X       | X       | 9  | 60 |
| 6  | ICT budgets            | X      |        |        |        |        |        |        |        |        |         |         |         | X       |         | X       | 3  | 20 |
| 7  | ICT delegated duties   | X      |        |        | X      |        |        | X      |        |        |         |         |         | X       |         | X       | 5  | 33 |
| 8  | ICT timetables         | X      |        |        | X      |        |        | X      |        |        | X       |         |         | X       |         | X       | 6  | 40 |
| 10 | Visions/Missions       | X      |        |        | X      |        |        |        |        |        | X       |         |         |         |         | X       | 4  | 27 |
| 11 | ICT strategic plans    | X      |        |        | X      |        |        | X      |        | X      | X       |         |         |         | X       |         | 7  | 47 |
| 12 | Computers              | X      | X      |        | X      |        |        | X      |        |        | X       | X       |         |         | X       | X       | 9  | 60 |
| 13 | Computer labs          | X      |        |        | X      |        |        |        |        |        |         |         |         | X       |         |         | 3  | 20 |
| 14 | Printers               | X      |        |        | X      |        |        | X      |        |        | X       | X       |         |         | X       |         | 8  | 40 |
| 15 | Projectors             | X      |        |        |        |        |        |        |        |        |         |         |         | X       |         | X       | 3  | 20 |
| 16 | Computer room access   | X      |        |        |        |        |        |        |        |        |         |         |         |         | X       |         | 2  | 13 |
| 17 | Internet               | X      |        |        | X      |        |        | X      |        |        | X       |         |         | X       |         | X       | 6  | 40 |
| 18 | Websites               | X      |        |        | X      |        |        |        |        |        |         |         |         | X       |         |         | 3  | 20 |
| 19 | Digital camera         | X      |        |        | X      |        |        |        |        | X      |         | X       |         | X       |         |         | 5  | 33 |
| 20 | Television             | X      |        | X      |        |        | X      |        | X      |        | X       |         |         | X       |         | X       | 7  | 46 |
| 21 | Radio                  | X      |        |        | X      |        | X      | X      |        | X      |         | X       | X       | X       |         |         | 8  | 53 |

Three female (20%) and twelve (80%) male principals were purposively sampled to participate in the open-ended focus group interviews. As in the quantitative research, there was a gender imbalance. Concerning age, no principal was below the age of 39 or older than 61. Their experience as principals ranged from 4 to 21 years. This suggested that the principals had sufficient experience with the implementation of the new ICT policy to enable the researcher to obtain the necessary data and to answer the research sub-questions.

When participants were asked about the extent to which they were equipped in terms of ICT infrastructure, resources, hardware and software, the general sentiments were that schools had critical shortages of the technological resources and facilities needed to implement the ICT national policy. Approximately, 87% of the participants lamented the challenges they faced in carrying out their technological leadership responsibilities with insufficient ICT resources. This was evidenced by P3 whose records and minutes of staff development meetings showed that the school was not yet equipped with ICTs and had not started incorporating ICTs into their curriculum. One principal explained that:

The Ministry requires every school in Zimbabwe to teach all our subjects in the new curriculum like the Technical and Vocational subjects, Humanities, sciences, maths and all the 16 languages, including our indigenous languages such as Shona, Venda, Ndebele, Tswana, Sotho, Shangani, Tonga, with technology, exactly as it is written in the ICT Policy ... But working without resources, it's a challenge (2016) (S3 Minutes of the meeting held on 3 December 2016 lines 27–34).

This principal seemed aware of the requirements of the national policy and the need to implement ICTs for teaching all subjects across the school curriculum. The participant also clearly communicated this to his staff but indicated that leading and managing the implementation process was hindered by a lack of ICT resources. The inventory showed no ICT vision document, plan, budget, printer or projector, although there was a computer in the principals' office that was mostly used for administrative purposes and not for instruction.

A close analysis of other principals' inventories, stock registers, policy documents and minutes of staff development meetings that were available indicated a general scarcity of technological records and devices. In terms of evidence of the existence of ICT policies, budgets, vision and staff development programmes, only six out of fifteen (40%) principals possessed them while nine out of fifteen (60%) did not. S6's minute books showed that the school did not possess an ICT budget, vision or strategic plan and that teaching local languages with ICTs was said to be challenging since there was no software in their vernacular languages. The following extract is taken from S6's minute book:

Ladies and gentlemen, we are day dreaming, teaching Shona, Ndebele, Tonga or Tswana with computers? Where do we get the software in these languages for instruction, let's be realistic... it's not possible as of now, may be some years to come (Records for S6 and School Development Plans, 2016).

Documentary analysis indicates that schools did not have plans to teach different subjects including local languages with ICTs. P6 only envisaged the use of ICTs in "years to come". The lack of an ICT policy and the fact that the national ICT policy had not been obtained from the Ministry of Primary and Secondary Education offices showed the lack of e-readiness to give instruction with or through ICTs. While some principals showed more willingness to deal with the obstacles and to implement the ICT policy, others such as P3 and P6 felt helpless. This was revealed by the responses of 12 out 15 principals to some of their teachers who had asked them about the availability of the ICT national policy in the schools. For instance, in a staff meeting held at S11, P11 responded that:

We will have to get the ICT Policy documents from the district education offices or check with other schools because currently we do not have directions to correctly infuse these gadgets into instruction. We don't even have timetables and budgets for ICTs but that this can be possible with help from others (S11 Minutes of the meeting held on 12 January 2017, paragraph 3 lines 5-6).

At S12, the principal (P12) clarified that:

You see, ladies and gentlemen, the protocol followed in our ministry implies that we can't access the policy documents within seconds. All channels of communication should be followed from head office, provincial office, and district offices down to our schools to get the policies. Since the introduction of the ICT policy for education we have this policy document even at our district. It is still in the pipeline (S12 Minutes of the staff development meeting held on 20 February 2017, paragraph 6 lines 257-262).

The views of P11 and P12 were commonly held by two out of fifteen (80%) of the participants interviewed on this aspect confirming the scarcity of the ICT policy documents within the studied schools.

P8, in contrast to P3, P6, P11 and P12, revealed more willingness to interact and get technical support from others about the use and integration of ICTs for pedagogy. This would help them to prepare ICT budgets and time tables to facilitate infusion into classrooms. The documentary evidence showed that although school leaders are aware of the need to teach with ICTs, there was still limited use of ICT pedagogy in the classrooms as the teachers and principals lacked a clear sense of direction on how to use ICTs to enhance instructional practices. The results contrast quantitative data in Table 12, which shows that 54.6% of the participating schools had ICT policy documents while 45.4% did not have the policies. However, existence of policy documents in 54.6% of the schools did not mean they held staff development meetings with teachers mainly because 68.1% of the principals asserted that they did not conduct staff development meetings on ICTs with their teachers while only 31.9% of the participants' staff developed teachers on ICT use. The findings support suggestions given by Warren (2015) who found that without technical support, teachers become frustrated and unwilling to employ ICTs into their lessons. Further documentary evidence revealed a critical shortage in 60% of the schools, of advanced instructional software and electronic resources including data projectors, digital cameras and ICTs for digital video editing. The ICTs that had been incorporated were computers, printers, televisions, radio cassette recorders and, to a minimal extent, slide and overhead projectors. The findings are consistent with Ndawi *et al.* (2013) concerning Harare secondary schools and the very limited use of ICTs within classrooms and the low availability of ICT resources and facilities to enhance teaching and learning.

School inventories, stock registers and budgets were also scrutinised to establish the availability and quality of ICT hardware, software and network components. Only three principals out of 15 (20%) had suitable ICT budgets, computer labs, printers, projectors and websites. Only two schools (13.3%), S1 and S13, had computer room access. In terms of printers, ICT timetables and the internet, six (40%) schools possessed them while 60% had no evidence of the use of ICTs and schedules for use in the classroom. Computers and the internet were available in 40% of the schools and principals who used them agree that the resources were significant for educational purposes and promoted student achievement and school improvement. Analysis of the records also show that only four principals (27%) had ICT vision and

mission statements (P1, P4, P10 and P15), seven (46.7%) kept strategic plans and televisions, five (33.3%) used digital cameras and eight (53.3%) had radios.

The picture painted by the principals regarding ICT availability is that schools had a critical shortage of resources, with one interviewee indicating that their school lacked simple ICTs such as telephones, a digital camera or television that could be used to provide data during lessons. The critical shortage of ICT infrastructure, resources and equipment shows that schools were not e-ready, for the integration of ICTs into education. Principals are clearly struggling to carry out their responsibilities as mobilisers for acquiring the resources needed to implement the ICT policy.

However, the study found many differences in the way schools are equipped with ICT resources. While some principals (P1, P4, and P13) reported having relatively sufficient resources, more (P2, P3, P5, P6, P8, P9, P11, P12, and P14) were poorly equipped and were not e-ready. Machado and Chung (2015) found similar results, confirming school to school variations in the way ICT resources were distributed and utilised, even in the USA. To Machado and Chung (2015), a lack of ICT resources might also suggest that principals who lacked ICT resources, did not prioritise their financing or were unable to do so, given their school context and leadership perspectives and practices.

These findings indicate that none of the schools could be regarded as highly equipped, since none had more than 60% of the possible ICTs. The findings are consistent with surveys by the Government of Zimbabwe (2014) on the implementation of the national ICT policy, which found that most public sectors, including education, experienced critical shortages of ICTs. Kabanda (2013) also found that many secondary schools in Zimbabwe lacked computers, printers, scanners, cameras and projectors. This highlights a major challenge for school leadership at a time when Zimbabwe is in dire need of the effective infusion of ICTs in schools.

The 2016 national ICT policy promotes learning and embedding of ICT literacy in the pedagogy of schools and requires those in authority to provide “equitable access to ICTs enabled education in all parts of the country, including disadvantaged, and

facilitate acquisition of basic, applicable and affordable ICTs equipment" (Zimbabwe National ICT Policy Framework, December 2016:14).

#### **4.6. Findings from three open-ended focus group interviews with 15 principals**

The qualitative data analysis was mainly based on research questions 3 and research question 4 was answered by integrating all the data sources and methods to provide a full picture about the principals' perspectives and practices in support of ICT integration for teaching and learning within schools. Table 32 provided information on the themes, sub-themes and categories that emerged from the interviews. Therefore, I answered question 3 using the seven open-ended focus group interview questions and then answered question 4 by analysing data sources from the entire study, since questions 1 and 2 were dealt with using quantitative data analysis. I carried out the focus group interview sessions at education offices such Better Schools Programmes complexes.

The emerging themes were identified question by question presented in Table 32, which summarises those themes, sub-themes and categories that emerged from the study.

Table 32: Summary of themes, sub-themes and categories from interviews

| 3. How do school principals enact their practices in support of ICT integration in teaching and learning within schools? |   |   |
|--|---|---|
| Theme  | Sub- theme                                | Category  |
| 4.6.1<br>Enactment of<br>practices in<br>support of<br>ICT<br>integration  | 4.6.1.1<br>Distributed<br>leadership      | 4.6.1.1.1 Distributing functions across formal and informal leaders |
|  |   | 4.6.1.1.2 Involving multiple individuals in decisions               |
|  |   | 4.6.1.1.3 Accomplishing tasks through interaction                   |
|  |   | 4.6.1.1.4 Giving teachers autonomy                                  |
|  | 4.6.1.2<br>Transformational<br>leadership | 4.6.1.2.1 Setting direction   |
|  |   | 4.6.1.2.2 Developing staff  |
|  |   | 4.6.1.2.3 Redesigning the organisation                              |
|  | 4.6.1.3<br>Pedagogical<br>leadership      | 4.6.1.3.1 Defining school mission                                   |
|  |   | 4.6.1.3.2 Managing school ICT curriculum                            |
|  |   | 4.6.1.3.3 Creating a positive learning culture                      |

Source: Interviews (FGI)

The first set of responses was based on research question 3, revealing how principals enacted their leadership roles in support of ICT integration into schools. Ten categories are illustrated in the third column of the table, clarifying leadership approaches enacted by the participants within their schools in a bid to promote effective incorporation of technological tools to improve the quality of education across the curriculum.

#### **4.6.1 Responses to research question 3: How do school principals enact their practices in support of the integration of ICTs in teaching and learning within schools?**

Concerning responses to question 3, I coded ten categories based on the three main themes shown in Table 32 above, which are: distributed leadership practices,

transformational leadership practices and pedagogical leadership practices enacted by school principals within their different schools.

#### 4.6.1.1 Distributed leadership practices

The study found that school principals varied in how they performed their leadership roles and responsibilities within their school systems. It appears that practices were influenced by perceptions about leadership and by preferred leadership style. To explore the way principals carried out their roles and responsibilities, questions were asked about the formal and informal distribution of leadership functions, involvement of others in decision-making, interactions with teachers and giving autonomy. The interviews reveal no co-enactment between school leaders and teachers. Leadership functions were not shared or spread, counter to the views of Wang (2015) that leadership should be stretched over the work of many and tasks accomplished through the interaction of multiple leaders. Sun *et al.* (2014: 614) investigated the role of formal and informal leaders in the implementation of external reforms into schools and found that leadership functions that are “distributed across leaders with formal authority and informal leaders who are influential by their positions within the professional network of a school promote the implementation of reforms”.

Yet, when asked about the way they share their duties and responsibilities, 90% of the fifteen principals responded that they were generally guided by the policies of the Ministry of Primary and Secondary Education, which prescribed their job specifications. They emphasised a bureaucratic hierarchy of power and authority emanating from the principal, through deputy heads, senior teachers, department heads and subject teachers, eventually down to the students. However, the focus group interviews (FGIs) reveal that although principals concurred that they were guided by policy in the way they performed leadership tasks, some held different perceptions. As P1 indicated:

Yes, the duties are clear; each one knows his position in the school structure. As head of the station, I plan, supervise, evaluate and report on school programmes and progress. But ladies and gentlemen, we can't run the whole school alone, administration duties should be shared, we don't have to be power hungry. I normally task teachers to do some of my duties especially, on this new curriculum which prioritises use of technologies which are new to us; other teachers can help (P1, January 2017)

In another FGI, P15 expressed his views differently by saying:

The Permanent Education Secretary for Ministry of Primary and Secondary Education Policy Circular used for promoting principals is the one that force us to execute our duties and responsibilities as stipulated. If you remember we, the heads, oversees the school and are responsible for designing and providing a relevant curriculum, management of financial and material resource, interpretation and implementation of Policy Circulars name it....and we remain accountable to the ministry. Sharing our roles with teachers is unfortunate (P15, 21 February 2017, line 1756).

A close analysis of these reflections and document evidence show that principals were very clear about their duties and responsibilities that according to P1 included planning, supervising, evaluating and reporting on school progress. Principals were also aware of the education policies that guided them in their practices. Some ICT policy documents were also noted in this analysis. P15 further highlighted that the design and provision of a suitable curriculum, resource mobilisation and policy interpretation were key responsibilities of the principals that could not be shared with teachers. P15 was quite opposed to the idea of distributing leadership responsibilities to subordinates. To him, this was “unfortunate”. The issue of accountability poses worries to P15 who felt that teachers might lack the knowledge and skills to perform leadership roles and that if teachers performed shoddy work on behalf of the school leadership, the principal would have to answer.

This view contrasts that of P1 who felt comfortable to share some of his leadership powers, being conscious of the fact that certain responsibilities require expertise that some leaders might be lacking and with which expert ICT teachers could help. The results indicate that while some principals' practices were shaped by the distributed leadership theory (P1), others (P14) were influenced by pedagogical leadership assumptions. The findings confirm the nature of the Zimbabwean Government Ministry of Primary and Secondary Education's centralised system whereby policies are disseminated from the top and “implemented” by means of top-down approaches posing challenges to any notion of the distribution of duties and responsibilities among educators at school level (Provincial Education Directors' Policy Circular Number 1 of 2017: 2). Thirteen (13) out of fifteen (15) participants concurred that

there is a hierarchy of authority and chain of command within their schools, whereby the principal is right at the top and does not consult teachers but simply passes instructions to them through intermediaries: deputy principal, senior teachers and heads of departments. For instance, when participants were probed about how ICT policy decisions were arrived at within their schools, P10 replied that:

The hierarchy of authority is clear. I am the highest authority in the school and teachers know that they follow instructions I give them through their immediate superiors like deputy head, senior teachers or heads of departments in that order, on implementing school reforms such as teaching with computers within classrooms. I consult from my superiors at the district if there is anything to ask not teachers. No! No! (P10, 23 February 2017, lines 2114-2117).

P14's sentiments, which are supported by 12 participants, indicate that instructional leadership practices were commonly enacted by most of the participants in the studied schools. During discussions on the strategies used by principals to promote the use of ICTs for instruction within schools, P14 was quoted to have said:

When we were appointed to principal ship, we were given policy circulars comprising all duties and responsibilities of school heads. Look at Principal Directors' Circular No. 1 of 2017 concerning our duties. We command these teachers, we direct, control and strictly supervise them on how to use ICTs with learners. This is what we do holistically to improve teachers' performance and students' achievement (P10, 27 February 2017 lines 3245–3250).

These views show that the common practice enacted by principals to enhance teacher's instructional activities was to apply guidelines received from the superiors without alteration to improve student achievement. Teachers' decisions are therefore, not valued in this case.

### **i. Involving multiple individuals in ICT decision-making processes**

The principals had varied opinions when asked for their views on the involvement of multiple individuals in ICT decision-making processes. Approximately 73.3% of the school principals executed their leadership roles individually, without involving their subordinates in making unified and shared ICT decisions. The principals argued that school leaders have the mandate to decide, interpret policy circulars, plan, organise

and implement strategic plans according to their own visions and mission, which teachers must follow and apply, as dictated by their superior. P6 justified his dislike of shared decisions by asserting that:

Really, there is no way subordinates can be absorbed in the decision-making structure on the use of the digital tools for teaching. It's our key duty of as principals to determine school mission goals and objectives as provided for by ministry without any deviation. I think these consultations you want would cause confusion and delays in real implementation of ICTs in the lessons. It's fast when teachers are just asked to teach with computers as directed by superiors (P6, February 2017 lines 4578–4583).

Principals did not consider the value of teamwork in implementing new reforms. The major reasons cited, according to P6, P7, P10, P11 and P12 included fear of being found deviating from policy. Additionally, the participants felt that the top-down approach to policy implementation was fast and expedient, while consulting individual staff members would create confusion and derail the implementation of policy reforms including ICT use. The hierarchical structure, starting with the Zimbabwe Ministry of Primary and Secondary Education, is based on power and authority, with the school principal right at the top. According to Printy (2014), while such a hierarchical structure and control paradigm may reject distributed leadership, it may be more practical to adopt shared leadership defined by Printy (2014) as a product of ongoing processes of interaction and negotiation among all school members as they construct and reconstruct a reality of regularly working productively and compassionately together. In either case, the principal is expected to "let go" the notion that leadership is hierarchically distributed and to value community and relationships in an ethical type of distributed leadership based on empowering individuals through recognition of their work as human beings.

The views of most of the principals confirm Alyami (2014) and Ottestad's (2013) studies that the cooperation among all actors and team-based endeavours be utilised to focus on the student and the learning process, producing strong communities of practice between practitioners and school leaders. Razzak (2015) suggests that teams might comprise the principal, ICT coordinators, teacher leaders and competent instructors to deploy their knowledge and skills in instruction, training

and even in challenging the roles of teachers. Bektaş (2014) goes further, contending that school systems and leaders should confer greater professional autonomy on teachers to enhance the attributes and effectiveness of their profession, while bringing a sense of belonging, value and achievement.

## **ii. Accomplishing leadership through interaction with various teachers**

Most principals agreed that healthy interactions among staff promoted higher levels of trust, togetherness and cooperation resulting in more effective implementation of the school policies. However, a quarter of the principals performed their leadership roles by trying to interact harmoniously and collaboratively with staff and other stakeholders. Three participants emphasised the need for all principals to distribute their leadership responsibilities so that members, including those that are not ICT savvy, would share the ICT knowledge and expertise. For instance, P13 said:

The technological age, demands a lot of coordination, teamwork and creation of ICT structures, which can help school leaders to quickly understand the new tools and implant them into our lessons, sharing ICT skills, resources, advising each other on the best methods to apply the tools. At our school, we have ICT committees comprising myself, deputy head, senior teachers, heads of various departments and we invite ICT technicians, help on technical issues. School development committees are also involved. Community members support our ICT programmes. But the problem is how some duties can be perfectly shared (P13, February 2017).

P14 supported that:

Interaction among teachers and their school principals facilitates effective use of computers for in the lessons. I noticed it ladies and gentlemen when I encouraged my teachers to mentor each other in ICTs and observe each other while teaching with these new tools. Some teachers could lead others and I gave them leadership posts (P14 February 2017)

These principals recognised the notion that, “sharing leadership responsibilities more widely in school is noble and acceptable because leadership of contemporary schools is too much for any one person” but other principals such as P3 and P5 queried whether all duties could be shared. They found it unfeasible, especially in schools operating in a hierarchical paradigm. For example, P3 and P5 argue that the

top-down approach to leadership that characterise the country's education system tends to impede power sharing because the top leadership would be answerable when subordinates perform leadership roles not as expected by the Ministry of Primary and Secondary Education. P3 said:

I disagree with the idea of sharing leadership roles with teachers because they won't stand before the ministry to account for lack of use of the new technologies. I as head of school will be answerable (P3, February 2017).

In support of P3's view, P5 questions that:

How can everyone become leaders or principals? Teachers should remain in their positions of teaching learners and be ready to be supervised by us school principals. That is what a chain of command means (P3, February 2017)

It appears that P3 and P5 do not hold distributed leadership perspectives but their leadership practices are influenced by instructional leadership theories, which are based on maintaining the status quo and sticking to institutional rules and regulations that rely on the leadership of one school principal per school. The ideas are supported by Harris *et al.* (2014) who agree with the use of pedagogical leadership approaches describing leadership as an influential process effected through authentic relationships that do not lend themselves to distribution, especially in a hierarchical and/or control paradigm. The data demonstrates that few participants enacted their practices through interactions and collaborative team structures that might have helped them to incorporate ICTs through coordinated team efforts.

### **iii. Giving teachers autonomy to implement the ICT policy as they wish**

When asked to give their opinions about the practice of giving teachers autonomy to implement the ICT policy as they wish, more than 80% of the principals indicated that they did not empower staff in this respect. The major justification given for this stance was that the tools are new and require close control and supervision in case the teachers and learners might abuse the technologies, for example, to play games and music. P2 vehemently complained that:

We can't allow a situation whereby teachers and students misuse and abuse these tools. I was surprised last week when I found the ICT teacher and girl students

enjoying themselves viewing films for entertainment while other boys were playing music using technology, no learning was going on. You know how internet connectivity is expensive; schools can't afford such wastages and abuses of facilities (P2, February 2017 lines 5789–5792).

Such worries hinder principals from empowering staff to utilise ICTs independently and as necessary. The major challenge for principals, such as P2, was to control the use of ICTs. One solution is for constant supervision by heads of departments and teacher-leaders, while professional development on the role of ICTs in education may also help. Razzak (2015) found that institutions, in the early phase of ICT implementation, tend to adopt a top-down management style, while leadership encompassed multiple leaders during later phases; the principal not necessarily being the key leader (Ottestad 2013:1212). Day *et al.* (2010) and Printy (2014) view the role of the principal as complex, to the extent that it is unrealistic to expect one person to perform the role without assistance from teaching and non-teaching staff. It is therefore important that principals consider redesigning their schools to accommodate distributed leadership practices, not least for the effective integration of ICTs.

#### **4.6.1.2 Transformational leadership practices of school principals**

The principals alluded to a variety of practices that they performed in support of ICT integration into teaching. Less than half of the principals used purely transformational leadership practices, many tending to use or combine with other practices, depending on the context. In terms of setting direction, developing staff and redesigning the organisation, the data revealed mixed views. Table 33 shows effective transformational leadership practices enacted by interviewees.

Table 33: Proposed effective transformational leadership practices

| Item | Leadership practices (N=15)                                    | Do not enact | Enact |
|------|--|--------------|-------|
| A    | SETTING DIRECTION  | 25%          | 75%   |
|      | 1. Building a shared vision                                    | 56%          | 44%   |
|      | 2. Developing consensus about goals and priorities             | 64%          | 46%   |
|      | 3. Creating high performance expectations                      | 22%          | 78%   |
| B    | DEVELOPING PEOPLE  | 51%          | 49%   |
|      | 4. Providing individualised support                            | 54%          | 46%   |
|      | 5. Offering intellectual stimulation                           | 67%          | 33%   |
|      | 6. Modelling important values and practices                    | 52%          | 48%   |
| C    | REDESIGNING THE ORGANISATION                                   | 45%          | 55%   |
|      | 7. Building a collaborative culture                            | 49%          | 51%   |
|      | 8. Creating and maintaining shared decision-making processes   | 58%          | 42%   |
|      | 9. Building relationships with parents and the wider community | 45%          | 55%   |

Source: Qualitative FGI (interview data)

Responses from the fifteen participants were converted into percentages, where N=15(100%). The percentages of principals who either enacted or did not enact the suggested effective transformational leadership practices shown in Table 33 were calculated and presented as indicated in Table 33. As indicated in Table 33, approximately 75% of the principals felt that they were responsible for determining the school mission, its objectives and for designing and providing a suitable curriculum. The views of participants on their enactment of transformational leadership practices are presented in Table 33 below. The majority (75%) of principals agreed that setting direction for ICT integration into teaching and learning was their key responsibility while twenty-five percent (25%) did not enact that practice.

P9 supported the idea of setting direction for school operations:

On visions and missions, we can't compromise our school standards by asking these young ladies and gentlemen to do it for us, it is our obligation to set standards, create a vision of the type of school we should lead and ensure that all teachers work towards achieving it. I framed mine and it is appealing to teachers except for a few who are always resistant, they do not support me (P9, January 2017, lines 1578-1586).

Identifying and articulating a vision was viewed as one of the key roles that could not be delegated. P9 thought involving teachers might compromise standards, since experience or training is needed to produce sound mission statements. The

development of a mission statement, while aimed at identifying new opportunities, can also unify staff around a shared goal (Leithwood *et al.*, 2010). This may enhance cooperation and collaboration. Ironically, the results of this study indicate that over half (56%) did not build a unified shared ICT vision or mission.

However, the results suggest that approximately 78% of the principals established performance standards, which are known to promote effectiveness among staff and to improve learner outcomes (Ng, 2015). When the principals were probed about their perceptions about developing people, 65% indicated that they agreed with providing individual support to staff, especially by offering them professional development and training on the integration of ICTs into pedagogy. Almost half (48%) modelled the use of ICTs but only one-third (33%) provided individual support for staff members. P7 described his support for individuals as such:

I inspire staff members at our school by giving them training skills whenever there is an innovation like these computers which should be infused into subjects. I take them to Zuma Lodge Hotel for a staff development workshop, invited resource persons and ICT consultants. I offer them transport and subsistence allowances when going for ICT workshops. I lead them by example in ICT use and e-tools are being embedded at my school, believe me or not, teachers are highly inspired (P7, January 2017, lines 890–895).

P7 was fully aware of how to motivate teachers using consultants, favourable places and subsistence allowances so that individual needs were considered. The participant felt that it was important to model the use of ICTs in the school for teachers to emulate. The idea was strongly supported by 11 out of 15 principals who stress that facilitating staff development training of teachers at hotels would enhance effectiveness and inspiration among members. This implied respect for staff and a concern for their personal feelings and training needs. Bellibas and Liu (2018) and Spillane *et al.* (2015) deem this important in their studies on principal leadership and its influence on teachers' instructional practices. During the FGIs, principals shared their sentiments on redesigning systems. The results displayed in Table 33, indicate that 55% had redesigned their mission and vision as well as restructuring their systems and processes. Almost half felt that creating and maintaining shared decision-making structures and processes improved effectiveness, including with

respect to the infusion of ICTs into their schools. Building relationships with the wider community was viewed by 55% of the principals as key to the process of coordination and resource mobilisation, since input from parents and other stakeholders was essential. Such practices are in line with the requirements of the policies governing the duties and responsibilities of school principals in Zimbabwe. For instance, one of the key roles of the school principals, stated in the Provincial Director's Policy Circular Number 1 (2017: 3) on promotions is "public relations and communication with stakeholders: parents, students, responsible authority, government ministries, donors and others". P8 explained that it was necessary to build relationships of mutual stimulation and elevation that converted followers into leaders and change agents, especially with the advent of new reforms such as ICTs. To quote the actual words of P8, she argued:

When reforms like these ICTs are introduced into our schools, we can't doubt the need for re-training of staff for new roles, re-structuring our administration, subject departments and the overall school goals and purposes, delegated responsibilities should be clarified who becomes ICT coordinator, teacher or ICT leadership...to improve learner achievement. (P8, January 2017, lines 987–996).

The responses show that the principal was aware of the merits of enhancing student learning through redesigning the shared mission and vision, fostering a collaborative culture towards agreed group goals, communicating high performance expectations to teachers and learners, providing appropriate role models, individual support and intellectual stimulation and promoting participation in the entire institution. The need for a new design and reallocation of duties to carry out the leadership's new roles and technical responsibilities emanating from the ICT policy was emphasised, in line with Ramorola (2014) who stressed the importance of proactive change in this respect. These roles would need to be supported by the provision of staff development training to ensure the building of a productive school climate and opportunities for teachers to learn. According to the study, leadership needs to be reconsidered as serving and enabling others to lead themselves, celebrating differences in capacities and backgrounds. These findings confirm the views of Ng (2015) as well as Leithwood and Sun (2012) who contend that transformational leadership should be utilised, since it offers opportunities for teachers to be inspired and become motivated towards instructional duties and to produce good results.

Ottestad (2013) likewise finds that some principals motivated their staff by enacting transformational leadership practices and offering incentives for teaching and learning with ICTs.

#### **4.6.1.3 Pedagogical leadership practices**

Compared to the responses regarding distributed and transformational leadership practices, principals were generally more inclined towards pedagogical leadership practices within their institutions. For instance, a very high percentage (86.7%) defined the school mission and managed the school ICT curriculum. Table 34 summarises how principals described their use of pedagogical leadership. Percentages presented in table 34 were obtained after quantifying the number of participants who either enacted or did not enact pedagogical leadership practices shown in table 34, where (N=15).

Table 34: Pedagogical leadership practices

| No | Categories (N=15)   | Enact % | Do not enact % |
|----|---|---------|----------------|
| 1  | DEFINING SCHOOL MISSION<br>. Designing school ICT goals<br>. Managing ICT instructional programmes<br>. Communicating ICT strategic plans   | 13.3    | 86.7           |
| 2  | MANAGING THE SCHOOL ICT CURRICULUM<br>. Supervising, assessing and evaluating instructional practices<br>. Coordinating and communicating curriculum progress<br>. Monitoring students' performance | 27.7    | 73.3           |
| 3  | CREATING A POSITIVE LEARNING CULTURE<br>. Protecting teaching time<br>. Promoting professional development<br>. Maintaining high visibility<br>. Providing incentives                               | 40      | 60             |

Source: FGI (interview data)

When probed about the instructional activities that principals perform in support of ICT integration into education, there was a high level of agreement among participants (86.7%) who concurred that school leaders were directly responsible for defining the school mission and vision for all school programmes. P1 asserted:

Surely, setting the pace for instruction is the key mandate of the school head and no one else. I ensure that before the beginning of the year, my school mission, vision and core values are in place to direct teachers on where we are going (P1, 21 October 2016 lines 56–58).

The role of the leader, according to P1, is that of setting direction by means of creating and sharing a common goal, as determined by the leader. However, the responses suggest that principals defined school goals, manage ICT instructional programmes and communicated ICT strategic goals without consultation. Leadership did not involve multiple individuals in goal setting, which consequently, could negatively influence the implementation process because staff might not feel ownership of the plans. For example, P6 vehemently complained about the non-involvement of staff in school decision making processes and argued that the major role of the leaders:

Should be to uphold commonly shared beliefs and values for the school so that the shared beliefs and values for ICTs might promote implementation of the ICT curriculum policy, teachers, parents and even students should decide on the school development plans which affect them (S6, October 2016 lines 67–69).

However, according to documentary evidence, P1 is amongst the most successful instructional leaders whose school was well stocked with ICT equipment and had effectively incorporated ICTs into education. According to the participant, principals' pedagogical role entails stimulating teachers in their professional duties and responsibilities and being responsible for teachers' professional development so that learners receive an education to enable them to reach the goals set by the principal. The school principal revealed a well-designed school mission, vision and core values that were directly linked to the requirements of the ICT policy directions as stipulated in the ICT National Policy. P1 adopted the vision and mission directly from the National ICT Policy Framework (Zimbabwe Government, 2016:15) without a single alteration, as follows:

**Vision 2020:** To transform Zimbabwe into a knowledge-based society by the year 2020.

**Mission:** To accelerate the development and application of ICT in support of sustainable socio-economic growth and development in Zimbabwe (School Development Plans for S1, dated 11 January 2017).

When instructional leadership practices are enacted as per the policy directives from higher offices, this offers limited chances for principals and teachers to innovate and adjust plans in accordance with their school needs and context. The findings are consistent with those of Bektaş (2014) that the critical educational leadership functions of principals are those that include the principal as a resource, communicator, strategic planner, quality controller and a visible presence. However, the study recognised that the wide range of demands placed on the principals as instructional leaders prevents them from giving adequate time and attention to their educational roles. McLeod (2015) also argues that the multifaceted roles of school administrators negatively affects their ability to implement school reforms; hence, the importance of delegating duties and responsibilities to teacher-leaders and ICT experts in various subject teams. It remains clear that school leaders must ensure the involvement of all stakeholders in decision making if ICTs are to be successfully utilised by staff in delivering the school curriculum.

Even though there are policy circulars stipulating a school principal's job description, the study found that some of the principals (13.3%) did not perform all of these responsibilities. Those who enacted their roles in this regard followed the Provincial Education Director's Policy (Zimbabwe Government, 2017: 2–3) in a literal sense in that their duties and responsibilities include "Determination of school mission goals and objectives, interpretation and implementation of Policy Circulars, provision and development of co-curricular activities". The results of this study corroborate the views of McLeod (2015) who stressed that principals are required to have a well-defined vision that should be clearly communicated to all implementers and stakeholders.

The results summarised in Table 34 show that most of the principals (73.3%) practised their role of managing the school curriculum. Approximately a quarter (27.3%) did not perform this duty. A close analysis of FGI narratives reveals that supervision, assessment and evaluation of instructional programmes were one of

their most significant functions. Principals generally understood that ICT integration called for thorough supervision and assessment to control and check on the delivery of the policy and for the provision of continuous professional development training programmes. P10 claimed that:

If we don't monitor these staff members we might be shocked one day to find that they are not sticking to the syllabi or not even incorporating technologies into their lessons. I mean, assessments, supervisions and reports should be our areas to improve our children's' outcomes. We must monitor their operations but we should leave room for innovations. We can't dictate everything to them; they need empowerment, autonomy to be creative (S10 February 2017, lines 1355-1359 P10).

By close monitoring and supervision, P10 played a pedagogical leadership role but in giving teachers autonomy and permitting them to innovate, P10 showed traits of distributed leadership practices. When probed further about the extent to which schools were implementing ICTs into the curriculum, 75% were still at a basic level. In all three FGIs, 85% of the participants concurred that the teachers and learners required support in assessing and utilising the various ICTs available within their localities. This is critical because, according to P5:

Lack of assessment and control of the ICT curriculum policy implementation might pose a danger that the current policy could be inconsistent with what is being practised within the classrooms (P5, October 2016, lines 113–115).

P5 indicated that instructional supervision, monitoring and evaluation required knowledge, skills and judgement in ICT matters in order to ascertain when ICTs might be useful, how to source and utilise them and how to analyse their use in pedagogical practices. Tondeur *et al.* (2012) emphasise that pedagogical leadership points to the need for principals to be fully involved in teachers' instructional practices by observing, counselling and implementing professional development when required. Other researchers have interpreted pedagogical leadership as a top-down and directive theory, specifically where it focuses on "turn around schools" in dire need of urgent reforms, such as ICT policy initiatives (Ottestad, 2013). The principals in this study accepted pedagogical leadership as an idea that refuses to go away, even if poorly defined (Orlando, 2013).

The duty of “supervision and staff development” is stated as duty number 7 in the Provincial Education’s Director Policy Circular Number 1 (2017: 2). The results of the study suggest that most principals created a positive learning environment. For instance, the FGI narratives reveal that 86% of the participants attempted to create a conducive environment by providing resources to support the infusion of ICTs into the classroom, despite facing many challenges. Different opinions were presented about possible measures to deal with the challenges, some of which are outlined in Figure 20. The results confirm the views of Alshahrani and Cairns (2016) that any form of leadership and management of reforms should be directly connected to the culture of the teaching and learning process. Figure 20 illustrates some of the suggestions advanced by participants to achieve effective implementation of the ICT policy within the schools.



Figure 8: Forms of support that principals provide for ICT integration

Many of the participants highlighted the provision of staff development, although most (65%) indicated that few, if any, ICT workshops had been organised in their schools. For the remainder (35%) who had been able to offer workshops, the training had been fruitful up to a point but failed to address the most pressing issues because

trainers misjudged the needs. This implied that there was limited needs analysis beforehand. P13, who bemoaned his own inability to use ICTs for pedagogical activities, was quick to say:

It's high time the ministry organises ICT workshops for us, the tools are new to us we need to have their knowledge to help our staff teach with them. Without training we won't go anywhere (P13, February 2017, lines 2211–2213).

According to P13, the need for conducting staff development workshops is long overdue. Similar to other principals who confirmed not receiving any training, P13 requires training to facilitate ICT infusion into teaching. The study found that most participants showed awareness of the value of these workshops, which according to P12, included raising awareness about the role and use of ICTs for education, increasing ICT confidence for leaders and staff and general improvement in staff competencies. Jita and Mokhele (2014) obtained similar findings and recommended training of teacher leaders, coordinated into teacher clusters, which can enhance their professional development. This is likely to develop staff so that they would share knowledge and expertise and serve as ICT supporters:

I offer workshops to staff members who have interest in ICTs use. I provide ongoing and timely staff professional development which centres on teaching and learning through computers (P14, February 2017, lines 2214–2216).

The provision of ongoing and timely professional training by P14 enables him to model the use of ICTs and increases opportunities for staff to embed ICTs into lessons. However, P14 provided workshops to interested teachers only. P15 differed greatly as he argued that all staff members should receive ICT training. The findings show that staff development programmes were perceived as highly significant but there was also great variability in actual provision, as indicated by the quantitative data. The perceived need for training is supported by Tella *et al.* (2015) as well as Konyana and Konyana (2015) in that professional development is key to the successful infusion of computers into instruction. Alenezi (2015a) also finds that inadequate training prevents teachers from effectively utilising ICTs for teaching and learning. However, in practice the results of this study reveal few training workshops were taking place. School leaders must therefore provide ICT training for all staff.

The study also found that the provision of financial and material resources for the implementation of ICTs in the classrooms was viewed by 75% of the participants as critical. For instance, P1 suggested to other participants that:

Ladies and gentlemen, you should offer WiFi networks at the schools such that every classroom is connected, adequate airtime to classroom staff to meet educational needs, hire school-based ICT teachers to act as project facilitators and use computer logins to understand usage patterns. All this means mobilising financial and ICT resources to enable our teachers to cope with challenges faced in trying to teach without basic resources (P1, 30 October 2016, lines 523–527).

P1 realised the role of the principal in mobilising resources to implement ICT reforms. His school, as shown from documentary evidence, is highly equipped with ICTs and is at an advanced stage of using ICTs for education. The results are consistent with observations made by Tondeur *et al.* (2012) as well as Machado and Chung (2015) who found that principals needed to play their role of equipping their schools with adequate, high quality ICT hardware and software. Similarly, Hutton (2014) and Hutton (2018) stress the significance of making ICT resources available for lessons as well as the presence of a strong technology leadership. The provision of resources and instructional support is likely to foster shared responsibilities and teamwork. This indicates the need for principals to ensure that sufficient finances and resources are available to staff on time to implement the ICT policy. In circumstances where all of the essential elements such as electricity, internet connectivity, hardware, software and financial resources are available when needed, the literature reveals that ICT integration can be a resounding success (Wastiau *et al.*, 2013; Waxman *et al.*, 2013).

During the focus group discussions, some participants reported deep concerns over the reliability of ICT equipment, internet connectivity, as well as the need for projectors and printing facilities to be serviced. P4 lamented that:

We have a serious challenge with technical issues about these computers. We don't have technical knowhow to deal with breakdowns, network issues and other faults, our machines are now 10 months without attention, no funds to hire technicians yet teachers should use them (P4, October 2016, lines 45–48).

The school had serious challenges, also encountered in other schools, which hindered teaching with ICTs due to incessant technical faults. In the current study, 13 out 15 principals agreed that technical problems were a barrier to the effort to embed ICTs into their schools. P1, whose school offers Computer Studies for all forms including examination classes, complained bitterly about electricity load shedding, power cuts and poor ICT resources, especially when examinations were in progress. There is clearly a great need for leaders to ensure that technical support is provided in schools. Similarly, Alshahrani and Cairns (2016) call for school leadership support in employing technical assistants for maintenance work, to ensure that ICT infrastructure is linked with software and for the implementation of updates and upgrades. Coordinators, teacher activists and technicians are required to stay abreast of ICT developments for pedagogical purposes, decide on ICT integration and organise appropriate staff development. The issue is that, software should be chosen or designed to suit teaching strategies as well as the level of competence of learners and staff across the various subjects. The study clearly shows that the availability of technical support differed from school to school. However, ICT technicians and expert teachers were cited as people who regularly offered valued support, suggesting perhaps that schools might all benefit from having local ICT technicians to assist them.

The majority of the participants in the study (98%) held a common view that principal leadership is pivotal to teachers' effective infusion of ICTs into instruction. Ten out of the 15 principals concurred that it was incumbent upon them to provide suitable leadership to enhance teachers' integration of ICTs into their lessons. Chigona *et al.* (2014:4) confirm that when teachers are embedding ICTs "they expect their lessons to be completed without any disturbances, be it technical or from power failure" and argue that school leaders should do everything possible to support teachers in ICT policy implementation. During the discussion, many principals (82%) recognised teachers' endeavours and proposed that they also needed to be praised whenever they perform excellently. P11 recommended:

Promoting them to positions of teacher leaders or mentors and even increase their salaries (P11, November 2016, lines 1177–1178).

Moral support and encouragement by principals, alongside the provision of training workshops and resources, were regarded as a further important type of support for ICT integration into schools. Razzak (2015), for example, examined school leadership in Bahrain and found benefit in incentivising teachers who excelled in integrating ICTs.

Approximately 69% of principals suggested that observing lessons could inspire teachers as well as highlight any challenges staff are encountering, especially regarding time limitations. P8 made the point:

At times, it's good for us to visit teachers' classes and interact with them sharing ICTs experiences and help them to deal with challenges these teachers might be overloaded and facing problems of inadequate time for ICTs, where our schedules need adjustments (P8, February 2017).

The suggestion is that regular meetings with staff are likely to encourage teachers to make time to integrate ICTs and seek out new ICTs for teaching and learning. The results confirm Winkelmann and Weiß.s (2011) studies on the impact of time as a factor in implementing ICTs in lessons, which revealed that the amount of time provided for teachers and learners in ICT use within classrooms is crucial. This implies that principals need to give adequate time for teachers and learners to enable them to learn how to prepare and utilise ICTs in their pedagogy.

#### **4.7 Responses to research question 4: How can the principals' perspectives and practices in support of ICT integration in Zimbabwean schools be understood and/or explained?**

Responses to question 4 were based on the findings obtained from all the data sources, which included reviewed literature that was related to the themes being explored, the survey data, documentary evidence and focus group interviews. The focus group interviews (FGIs) revealed that principals' leadership perspectives significantly influenced the way they enacted their leadership roles in support of the integration of ICTs in the teaching and learning of different subjects across the school curriculum. Abdullah *et al.* (2013:795) also found that school leadership perspectives could explain leadership practices. It is on this understanding that the

current study further explored principals' leadership perspectives as a means of explaining how they approached their roles and responsibilities in support of ICT infusion into pedagogy.

#### **4.7.1. Linkages between perspectives and practices of school principals with reference to the question, themes, sub-themes and categories**

The analysis done to compare links between the perspectives and practices of school principals was done with reference to the research questions, themes, sub-themes and categories as illustrated in Table 35 below. Each of the data sets and methods used in the study were closely analysed to get a vivid picture and explanation of the school principals' leadership perspectives and practices in support of ICT integration within the schools. Table 35 presents the major themes and categories that emerged from literature and quantitative data analysis. The survey question data provided major themes derived from factor analysis procedures that were conducted through SPSS Version 23. There appeared to be close association between the principal leadership perspectives in Table 35 section 4.7.1 and principal leadership practices presented in section 4.7.2.

Table 35: Understanding principals' perspectives and practices in support of ICT integration

|   |   |   |
|---|---|---|
| 4. How can principals' perspectives and practices in support of ICT integration in Zimbabwe be understood and/or explained? |   |   |
| 4.7.1<br>Principals'<br>perspectives  | 4.7.1.1<br>Distributed leadership         | 4.7.1.1 .1Distributing functions to formal and informal leaders |
|   |   | 4.7.1.2 .2Involving multiple individuals                        |
|   |   | 4.7.1.3 .3Accomplishing tasks through interaction               |
|   |   | 4.7.1.4 .4Giving teachers autonomy                              |
|   | 4.7.1.2<br>Transformational<br>leadership | 4.7.2.1 .1Setting direction                                     |
|   |   | 4.7.2.2 .2Developing staff                                      |
|   |   | 4.7.2.3.3 Redesigning the organisation                          |
|   | 4.7.1.3<br>Pedagogical leadership         | 4.7.3.1.1 Defining school mission                               |
|   |   | 4.7.3.2 .2Managing school curriculum                            |
|   |   | 4.7.3.3.3 Creating a positive learning culture                  |
| 4.7.2   | 4.7.2.1                                   | 4.7.2.1.1 Distributing function across formal and               |

|                       |  |   |
|-----------------------|--|---|
| Principals' practices | Distributed leadership                     | informal leaders                                      |
|                       |  | 4.7.2.1.2 Involving multiple individuals in decisions |
|                       |  | 4.7.2.1.3 Accomplishing tasks through interaction     |
|                       |  | 4.7.2.1.4 Giving teachers autonomy                    |
|                       | 4. 7.2.2<br>Transformational<br>leadership | 4.7.2.2.1 Setting direction                           |
|                       |  | 4.7.2.2.2 Developing staff                            |
|                       |  | 4.7.2.2.3 Redesigning the organisation                |
|                       | 4.7.2.3<br>Pedagogical leadership          | 4.7.2.3.1 Defining school mission                     |
|                       |  | 4.7.2.3.2 Managing school curriculum                  |
|                       |  | 4.7.2.3.3 Creating a positive learning culture        |

Source: Reviewed literature and questionnaire survey data

The data used to develop the themes for Table 35 suggests that there is a very close relationship between leadership perspectives and practices. For instance, the categories for distributed leadership perspectives are synonymous with those of the distributed leadership practices of school principals, as shown Figure 21 below.

#### 4.6.1 Perspectives



4.6.1.1. Distribution of functions

4.6.1.2 Involvement of multiple leaders

4.6.1.3 Interaction

4.6.1.4 Autonomy

#### 4.6.2 Practices



4.6.2.1 Distributing leadership across formal & informal leaders

4.6.2.2 Accomplishing leadership through interaction

4.6.2.3 Accomplishing leadership through interaction

4.6.2 .4 Giving teachers autonomy

Figure 9: Comparison between perspectives and practices (Distributed)

Source: Interview data and documentary evidence

Distributed leadership perspectives and practices show a striking resemblance in the sense that a participant who held positive perceptions in the distribution of leadership

functions across formal and informal leaders utilised the practice of distributing responsibilities across school administrators, including those with formally designated positions as well as those without formal positions, such as subject teachers. Therefore, by examining perspectives we can comprehend practice, and vice versa. For example, P6 did not hold a distributed leadership perspective, arguing:

There are no ways subordinates can be absorbed in the decision-making process. It is our duty as principals to determine school mission and goals.

This indicates that the principal alone designed school goals for S6 without involving teachers. Similarly, P15 asserted that “sharing our roles with teachers is unfortunate”, revealing that he did not distribute or share his duties and authority.

Similar comparisons would assist in understanding the relationships between principals’ transformational and pedagogical leadership perspectives and practices. The match is evident as viewed by Dogan and Almus (2014) in that the beliefs and perspectives correlate with actions and practices.

In this study, multiple data sources such as open-ended focus group interviews (FGIs), documentary evidence and surveys were used to determine principals’ leadership perspectives and practices concerning ICT use within schools. To explore emerging themes in detail, probing questions were asked in the FGIs to encourage discussion and to identify their perspectives and practices. By analysing principals’ initiatives and roles in support of ICT integration within their secondary schools in Zimbabwe, according to the themes, sub-themes and categories of the theoretical framework, we can perhaps understand and explain their leadership perspectives and practices.

#### **4.7.2 A summary of ICT leadership roles, perspectives and practices in ICT integration in schools**

The initiatives or roles of school principals, their perspectives and practices, concepts and descriptors are presented in Table 36 below. Al-Mulhim (2014) argues

that workers' beliefs and perspectives are critical to the successful implementation of reforms. As suggested by these authors, the study uses these elements to understand principals' perspectives and practices in relation to the distributed, transformational and pedagogical leadership theories that frame the study.

Table 36: Summary of ICT leadership roles, perspectives and practices

| <b>Item</b> | <b>Initiatives/Roles</b>  | <b>Perspectives</b>                            | <b>Concepts</b>  | <b>Descriptors</b>   |
|-------------|---|--|--|--|
| 1           | Distributed leadership tasks across formal and informal leaders | Distributed                                    | Shared leadership<br>Teacher leaders   | Delegating duties<br>Develop teacher leaders   |
| 2           | Involving multiple individuals in ICT decisions                 | Distributed<br>Transformational                | Involvement<br>Teamwork<br>Participatory   | Involving various people in decision making  |
| 3           | Accomplishing leadership through interaction                    | Distributed                                    | Interaction<br>Consultation<br>Shared vision   | Promoting interaction and coordination among staff   |
| 4           | Giving teachers autonomy  | Distributed<br>Transformational                | Empowerment<br>Autonomy  | Empowering staff<br>Offering freedom for innovation and creativity   |
| 5           | Setting direction   | Pedagogical<br>Distributed<br>Transformational | Goals/Strategic plan<br>Vision/Mission<br>Shared values & beliefs<br>Expectations                | Building a shared ICT vision<br>Developing consensus about ICT goals<br>Creating high expectations                   |
| 6           | Developing staff  | Pedagogical<br>Distributed<br>Transformational | Individualised support<br>Intellectual stimulation<br>Modelling                                  | Promoting individualised support<br>Offering intellectual stimulation<br>Modelling important values and practices    |
| 7           | Redesigning the organisation                                    | Pedagogical<br>Transformational                | Team structures<br>Collaborative structures<br>Coordination<br>Shared decisions<br>Sound rapport | Building collaborative culture<br>Creating and maintaining shared decision-making structures and processes           |
| 8           | Defining school mission   | Pedagogical<br>Transformational                | Goals/objective<br>Vision/mission  | Designing ICT goals<br>Managing ICT instructional programmes<br>Communicating ICT strategic plans                    |
| 9           | Managing school ICT curriculum                                  | Pedagogical<br>Transformational                | Goals/objective<br>Communication<br>Coordination<br>Assessment/supervision<br>Monitoring         | Supervising/<br>Assessing<br>Evaluating instructional practices<br>Coordinating<br>Communicating curriculum Progress |

|    |                                      |                              |   | Monitoring staff and learner performance  |
|----|--------------------------------------|------------------------------|---|---|
| 10 | Creating a positive learning culture | Transformational Pedagogical | Resource management<br>Continuous professional development<br>High visibility<br>Motivation | Protecting teaching time<br>Promoting professional development<br>Maintaining high visibility<br>Providing incentives |

Source: Adapted from literature, Abdullah *et al.* (2013)

As depicted in Table 36, which summarises the tenets that help us understand and explain leadership perspectives and practices, the emerging themes in relation to distributed, transformational and pedagogical leadership perspectives were found to be influencing school leaders' support for ICT integration. The eight leadership roles linking leadership perspectives, practices and ICT integration can be identified in Table 36 as: creating collaborative teams (1–3), empowering staff members (4), setting direction (5), developing staff (6), redesigning the organisation (7), defining the school mission (8) and creating a positive culture (10). The themes align with the leadership practices proposed by Hallinger (2013) and Wei (2016) in support of the implementation of curriculum reforms. The study reveals that each leadership practice, role or initiative is directly linked to its related perspectives, concepts and descriptors. This gives a fuller explanation of the school principals' perspectives and practices as they interacted with staff members, learners and other stakeholders. The findings confirm the views of Haßler *et al.* (2016a) who found that teachers' prior values, attitudes and practices might significantly shape their responses to experiences with educational programmes that involve ICTs.

A close analysis of the perspectives and practices illustrated in Table 36 shows that principal leaders did not rely on a single perspective or practice in their endeavours to promote ICT integration. For example, when setting direction for ICT implementation, the results of the study reveal that all three leadership perspectives were used. The findings support the general view in the literature that nothing is a so-called "best leadership perspective" (Bektaş, 2014:37). This shows that every school requires a style that suits its context. Therefore, this can explain the variability of responses for the quantitative and qualitative data found in this study. The study

results also suggest that principals exhibited managerial and leadership skills while adopting distributed, transformational or pedagogical leadership perspectives as dictated by the existing situational needs. The findings are consistent with the views of Ghamrawi (2013) in that leadership does not prescribe the best style but each one is suitable for every unique context.

## **4.8 Integration of quantitative and qualitative results**

### **4.8.1 Principals' knowledge and perspectives in ICT integration into school**

The quantitative findings reveal that although the principals acknowledged the importance of ICTs for instructional purposes, most were not knowledgeable in ICT use and integration into the curriculum. This is shown by the low means in items 5 (use of websites), 8 (recent training) and 16 (ability to offer training) of 2.12, 2.32 and 1.92 respectively in Table 16, indicating that ICT skills were not generally honed to a level suitable for pedagogical purposes. While the results reveal a statistically significant relationship between principals' ICT knowledge and ICT integration ( $r=0.701$ , Table 13), age, qualification and number of years of experience with ICTs (Table 14) were not statistically significant predictors of ICT integration. In terms of leadership perspectives, principals had low perception scores for distributed leadership with only 30.9%, compared to 36.3% for transformational leadership and 59.5% for pedagogical leadership (factor analysis results tables 20, 24 and 27).

The quantitative results are confirmed by the qualitative interview results, which indicate that more than 60% of the principals lacked sufficient ICT technological knowledge and skills for them to promote ICT integration into the school curriculum. Results from the focus group interviews reveal that most of the principals rarely adopted distributed and transformational leadership approaches to support the integration of ICTs.

#### **4.8.2 Principal leadership practices in support of ICT integration**

The quantitative results of this study showed quite a high variability in principals' leadership practices. For instance, the findings documented in Table 20 showed principals' preferences in terms of distributed leadership practices, with higher mean scores for sharing lesson plans and allowing teachers to develop digital resources. The findings in Table 23 regarding transformational leadership showed that developing and communicating an ICT vision, developing shared beliefs and developing staff had high means and some modes of 4, showing agreement to model ICT use and to build collaborative structures and teams.

The qualitative analysis showed that the principals believe their practices influence the motivation of staff and can either hinder or enable the effective implementation of ICTs in schools.

The qualitative findings, however, showed pedagogical leadership as the most prevalent perspective in these Zimbabwean secondary schools. This is evidenced by over 80% of the principals preferring its use to define school missions, manage the ICT curriculum and redesign the organisation in accordance with policies, albeit without empowering staff or giving them autonomy. The satisfaction indexes of 59.5% for pedagogical leadership, 36.3% for transformational leadership and 30.9% for distributed leadership prove the case. These inconsistencies were also found by Albugarni and Almed (2015) who found many variations in leadership practices among technological leaders in schools and that leadership practices tended to be applied situationally. This might help to explain why the implementation of ICTs varied so much from school to school.

#### **4.8.3 Principals' enactment of roles in support of ICT integration into schools**

The quantitative results reflect that the support provided by principals for integrating ICTs for teaching and learning within their school contexts is critical. This support includes principals' provision of ICT resources, individualised support, facilitating ICT

programmes, the creation of teams and an enabling environment as indicated by the high scores for items 12-13 in Table 15. These findings are in line with the views of Razzak (2015) as well as Nikolopoulou and Gialamas (2016) that, at school level, provision of support, funding, training and ICT facilities promote the effective infusion of ICTs for education.

#### **4.8.4 Understanding principals' perspectives and practices in support of ICT integration**

The study found a close relationship between leadership perspectives and practices, which principals enact in support of ICT integration into the curriculum. Abdullah *et al.* (2013) assert that the perspectives of principals determine their leadership practices. By analysing the emerging themes, sub-themes and categories from the study, it is possible to understand and explain principals' leadership perspectives and practices enacted in support of ICT integration into education. The quantitative and qualitative analyses provide evidence in support of the eight key leadership roles and responsibilities of principals in implementing ICTs in schools. Table 36 explains the link between each of the eight practices and leadership perspectives, which are aligned with the sub-themes and categories presented as concepts and descriptors. The study, therefore, showed that the distributed, transformational and pedagogical leadership perspectives, which frame this study, all influence the way school leaders enact their roles in support of ICTs in schools. The views of Ottestad (2013) that principal leadership centred on the theory of distributed, technological, pedagogical and transformational leadership are directly linked to principals' use of ICTs for pedagogy.

#### **4.9 Summary of the chapter**

This chapter presented, interpreted and analysed the data to respond to the four research questions. The quantitative data was presented through descriptive statistics such as the mean, mode and standard deviation, while inferential statistics such as factor analysis, t-tests and Pearson's correlation coefficient were used to infer meaning from the data. Qualitative data from open-ended focus group

interviews were presented in themes and categories. In line with the requirements of the sequential explanatory mixed-methods approach, quantitative and qualitative data were analysed separately (Creswell, 2014a) and then combined at the interpretation stage where the qualitative findings were used to either support or reject the quantitative findings.

The literature was also used to confirm the study results where there were similarities or contradictions. Even though comparison between quantitative and qualitative analysis revealed some contradictions, the findings showed that school principals played significant roles in the integration of ICTs for teaching and learning across the secondary school curriculum in Zimbabwe. A close link was noted between the principals' distributed, transformational and pedagogical leadership perspectives and their practices in support of ICT integration within their different school context. The study found that the ICT integration process was still at a basic level in most of the schools studied and that ICT use varied per principal. Studies conducted by Leithwood *et al.*, (2010) and Hallinger and Heck (2011b) found that the variations between high performing and low performing school leaders can be attributed to various levels of their leadership distribution. In Chapter 5, the findings of the study and some conclusions will be presented, together with a summary of the study before giving recommendations and implications for policy and practice.

## **5. CHAPTER 5: DISCUSSION OF FINDINGS, CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS**

### **5.0 Introduction**

In the previous chapter, I presented, analysed and interpreted the qualitative and quantitative results of the study thematically in response to the research questions. Based on the results highlighted in Chapter 4, this chapter discusses the key findings obtained from the empirical evidence according to the theoretical base of related literature presented in Chapter 2 as well as findings from other scholars. The chapter provides a summary of the study and highlights key methodological issues in relation to the techniques discussed in chapter 3. Conclusions will be drawn, based on key findings, before making recommendations and identifying the implications of the study for policy, practice and future research. Concluding remarks will be given after highlighting the limitations of the study.

### **5.1 Summary of the study**

The study aimed at exploring the roles that school principals play in the integration of ICTs in teaching and learning in public secondary schools in Zimbabwe and how these roles are enacted in practice. A large body of research argues that principal leadership plays a pivotal role in setting the stage for effective infusion of ICTs into the school curriculum (Bektaş, 2014; Day *et al.*, 2010; Spillane *et al.*, 2011). This study was thus meant to provide more insights into the roles of these leaders in the incorporation of technologies into instructional practices for school improvement and learner achievement. In a bid to investigate the ways in which principals enacted their leadership roles, three different leadership theories comprising distributed leadership, transformational leadership and pedagogical leadership perspectives (Figure 4 chapter 1) were utilised to frame this study focusing specifically on their usefulness in the integration of ICTs for teaching and learning within the schools. With regard to the principals' distributed leadership roles and responsibilities, a large body of literature drawn from the works of Harris *et al.* (2015), Spillane *et al.* (2003) as well as Spillane and Healey (2010) was essential in framing the study in order to

establish the extent to which the practices of principals were influenced by distributed leadership perspectives. Transformational leadership (Day and Sammons, 2013) was used alongside the notion of pedagogical leadership (Hallerger *et al.*, 2013) to complete the trio of leadership perspectives guiding this study. This provided different theoretical frameworks within which to conduct the research. The use of these three different theoretical frameworks was justified based on the understanding that there is no so-called best leadership perspective (Salleh and Waxman, 2014) because every school context and situation requires a specific leadership perspective to be demonstrated by school principals. Day and Sammons (2013) contend however, that the leadership perspectives of school principals play a significant role in influencing ICT integration into teaching and learning. As illustrated in Figure 4 (chapter 1) school principals have the choice to blend these perspectives so that they complement each other, depending on the requirements of the school situation. Day *et al.* (2010) and Hargreaves *et al.* (2014) suggest that a combination of the three perspectives may well be effective in ensuring the successful infusion of ICTs for teaching and learning. The literature indicates that the approaches are not mutually exclusive (Ottestad, 2013).

Firstly, the study examined school principals' knowledge and perspectives of ICT integration in teaching and learning of different subjects across the secondary school curriculum in Zimbabwe. Jita (2016a) and Maboya (2014) argue that there is a strong link between ICT knowledge and its adoption by educators, and that the lack of knowledge and skills on how to embed ICTs with pedagogy can hinder effective implementation of the ICT vision plans. The question to be answered is: What knowledge of ICTs do school principals have and what are their perspectives of ICT integration in teaching and learning of different subjects across the curriculum in secondary schools in Zimbabwe? Studies in Zimbabwe have tended to focus on the use of ICTs by teachers and students without giving specific attention to the school principals (heads). Therefore, this research was significant in establishing the level of principals' ICT knowledge and the nature of their leadership perspectives in support of teachers and students' ICT incorporation. Figure 22 depicts the three theoretical frameworks that were used to frame studies that explore school leadership and ICT integration in education.

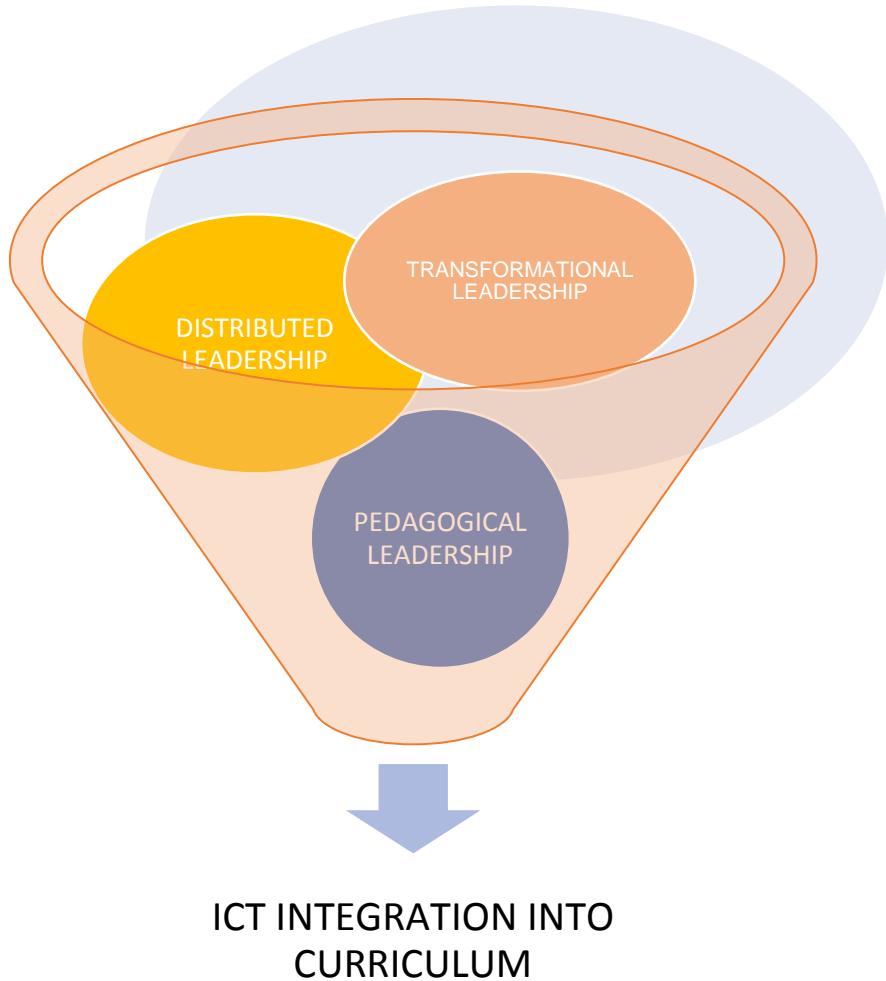


Figure 22: The theoretical frameworks used to frame the study

Source: self-illustration (Theory adapted from Ottestad, 2013)

Secondly, the study analysed the practices that characterise the enactment of principal roles in support of the integration of ICTs for teaching and learning (section 4.7.1). Moore (2016) and Bhat and Beri (2017) assert that it is critical for principals to understand their roles clearly in support of instilling ICTs into pedagogical practices. The question asked is what practices characterise the enactment of their roles in support of ICT integration in teaching and learning? Thus, the answer to this question was meant to clarify the key duties and responsibilities that school principals perform to promote the infusion of ICTs into their pedagogical practices and thereby improve the effectiveness and efficiency of teachers and of student achievement. This was necessary because most studies conducted in Zimbabwe have tended to focus on the general roles and responsibilities of school leaders in the implementation of the school curriculum with very limited literature on principal

leadership of ICTs. Scholars such as Shadreck (2016) analysed Zimbabwe's national ICT policy implementation without focusing on principals' roles, while Kabanda (2013) explored the use of ICTs in education, although limited reference was made to principal leadership roles in ICT infusion into secondary schools. Even the Zimbabwe Government (2017) Principals' Directors' Circular Number 1 (2016), which provides for secondary school heads' duties and responsibilities, does not particularise principal leadership functions in ICT integration.

Thirdly, the study established the way school principals enacted their practices (Figure 20, section 4.7.1) in support of embedding technologies into the school curriculum, focusing on the type of support offered by these principals for effective implementation of the ICT national policy for education in their different school contexts. The question raised was how do principals enact their practices in support of the integration of ICTs in teaching and learning within the schools? It appears that previous studies in Zimbabwe by Bukaliya and Mabika (2012), Konyana and Konyana (2013) and Jita (2016) focused on pre-service teachers' use of ICTs and challenges experienced by educators in implementing the national ICT policy but did not tackle the support that school heads provide for successful infusion of ICT gadgets in pedagogy. The focus of previous research had been on the challenges experienced by teachers in integrating ICT tools in classrooms and the government's support for ICT policy implementation in schools.

However, providing empirical evidence on the type of support offered by principals in integrating ICTs into the classrooms is significant in illustrating the successful infusion of the digital devices to improve the quality of education in schools. This is in line with the views of Razzak (2015) and Alenezi (2017a) that principals' clear understandings of the type of support needed for ICTs infusion into education is important for them to be able to promote the use and integration of these tools into their classrooms successfully.

Fourthly, the study re-examined the links between principals' perspectives of ICT integration in Zimbabwean schools and their supporting practices (Table 36) with a view of providing a clear understanding of their leadership perspectives. This would further explain how their perspectives in support of implementing ICTs in schools

influence their practices. The question to be responded to is how can the principals' perspectives and practices in support of ICT integration in Zimbabwean schools be explained and/or understood? There is insufficient literature on Zimbabwe to facilitate a clear understanding of the relationship between the perspectives and practices of principals in support of the use and integration of ICTs in schools. Yet, previous studies reveal that there is a close link between leadership perspectives and practices (Li *et al.*, 2015); hence, a clear understanding of the roles and responsibilities of school principals can help explain leadership perspectives as depicted in Table 36. By combining the findings obtained from different data sources, which include the survey, documentary evidence and open-ended focus group interviews, it was possible to obtain a vivid picture of how principals' perspectives influence their leadership practices in support of the implementation of the ICT national policy.

To respond to the research questions adequately, a sequential explanatory mixed-methods study was conducted. A closed-ended questionnaire was used to collect quantitative data and to build a general picture of the knowledge and perspectives that principals have towards ICT integration into instruction (Theme 1, sections 4.1.1–4.1.3). The same instrument was used to establish the distributed, transformational and pedagogical leadership practices in support of embedding ICTs into education (sections 4.1.2.1–4.1.2.3). The follow-up qualitative focus group interviews helped to explain the quantitative findings and to provide an interpretation of the survey results. Additionally, interviews and documentary evidence (Table 31 section 4.6.1) helped to build a deeper understanding of leadership perspectives and practices in support of ICT integration in schools, in line with Li *et al.* (2015) and as summarised in Table 36.

The findings were based on the following lines of inquiry:

1. Examining school principals' knowledge and perspectives of ICT integration in teaching and learning of different subjects across the public secondary school curriculum;

2. Analysing practices characterising the enactment of principals' roles in support of the integration of ICTs for teaching and learning;
3. Establishing the way principals enact their practices in support of ICT integration in teaching and learning in schools;
4. Understanding the principals' practices in support of ICT integration in Zimbabwean schools.

The themes emerged during the survey, documentary analysis and open-ended focus group interview phase of the research.

## **5.2 Discussion of key findings of the study**

This section discusses the major findings as guided by four research questions and presented in themes and categories presented in Table 32.

### **5.2.1 Research question 1: What knowledge and perspectives do school principals have towards ICT integration for teaching and learning across the secondary school curriculum in Zimbabwe?**

The first overarching research question inquired into and analysed principals' knowledge and perspectives towards ICT integration into the school curriculum. The responses to the survey questionnaire (Appendix A and B) were intended to provide insights into the principals' self-perceived knowledge and expertise of ICTs as well as the leadership perspectives that influence them in integrating ICTs into their pedagogical practices in their school contexts. Documentary evidence (Table 31) gave a vivid picture of how the principals perceived their individual school's e-readiness for ICT integration considering the available ICT infrastructure, equipment and other resources. In addition, the three focus group interviews, where principals freely interacted during the discussions to share their opinions on the knowledge that they had and their perspectives of ICT infusion into schools, provided data to respond to this critical question.

### **5.2.1.1 School principals' knowledge of ICT use and integration in schools**

Generally, the findings of this study suggest that there have been substantial variations among school principals' knowledge and perspectives of integrating ICTs in teaching and learning in public secondary schools. Quantitative results showed that the ICT literacy rate for principals ranged from 2% to 65% in some schools, indicating a range of limited to substantial e-learning knowledge. This is further confirmed by results in Table 31, which indicate that only 6.5% (17 out 280 principals) were ICT experts, while 54 (20.8%) were intermediate and most (189 or 72.7%) were novices. The low average mean score of 2.289 and a high standard deviation of 1.191 confirm that participants were at a wide range of levels in terms of ICT implementation but showed a high positive perception in using the new technologies for education.

The development of ICT knowledge and expertise among principals was generally low. This explains the low level of ICT integration in many of the 280 secondary schools investigated. The evidence showed that ICT use in the classrooms was not frequent. Similarly, documentary evidence showed that only 3 out of 15 schools had reached an advanced stage in using ICTs for pedagogy, while others were still struggling to learn basic ICT applications such as word processing, use of the internet, emailing and creating PowerPoint presentations, let alone how to infuse ICT tools into pedagogy. P6 confirmed that computers were still new to him, while P8 confessed: "I don't know anything about computers, typing is done by clerks and secretaries" and P3 admitted: "we haven't started using them for instruction". Li *et al.* (2015) also note that principals have not really become ICT knowledgeable enough to collaborate with other stakeholders and keep pace with the fast development of innovation in ICT. The authors argue that school principals need to acquire assessment and supervision skills to reorganise their schools for the successful infusion of technological tools within lessons. Afshari *et al.* (2012) find a weak relationship between ICT competence and transformational leadership in integrating ICTs into instruction, but still note that ICT competent leaders were generally found to be effective implementers of ICT programmes. The most critical factor for effective ICT infusion into the curriculum might therefore lie in the technological leadership

practices of school leaders, as argued by Abdullah *et al.* (2013), who found principal leadership practices and styles as key determinants of ICT integration within schools.

Thus, the findings indicate that principals without ICT knowledge and expertise felt uncomfortable in using and integrating ICTs for teaching and learning in their school contexts. On the other hand, ICT-competent principals such as P1 were found to be effective and efficient in ICT use and integration into the school curriculum. In contrast to ICT leadership expectations, the school principals in this study were not generally knowledgeable enough to keep pace with the fast pace of technological change or to be optimistic about ICT integration. Gomba (2016) and Shadreck (2016) criticise the lack of such elementary ICT applications. They argue that word processing, internet, email, file navigation, spreadsheets, presentation software and database management systems are basic qualifications that every 21<sup>st</sup> century education practitioner or leader should possess to improve pedagogical practices and learner achievement, implying that educational authorities need to help teachers to expand and elaborate their knowledge systems. In contrast to these views, Ertmer and Ottenbreit-Leftwich (2010:260) argue that, “knowing how to use technology hardware such as digital camera, science probe, software, presentation tools, social networking site...is insufficient to enable teachers to use ICTs effectively in their lessons”. The authors assert that teaching with and through ICTs require educators to expand their knowledge of instructional practices across multiple elements of planning, leading, organising, implementing and evaluation processes. The lack of these ICT-related management and leadership skills hinders technological infusion into schools.

Thus, it can be understood from these findings that many principals were worried about their lack of knowledge in ICTs in the context in which they are expected to champion, lead, manage and support ICT integration in teaching and learning in all subjects across their school curriculum. This matches the findings of Alenezi (2017b) and Ramorola (2014) that school principals lacked the essential ICT knowledge, vision and experience to manage and lead ICT integration programmes in their schools, and that the lack of ICT leadership skills was viewed as a barrier to the use of ICTs for instruction. Konyana and Konyana (2013) obtained similar findings when

they surveyed schools to establish the ICT literacy levels of teachers in Zimbabwe, in that despite ICTs being available to most public schools through the Presidential Computerisation Programme, there was less evidence of the use of ICTs. It appears that a gap still exists between policy and practice in terms of ICT integration into the curriculum.

The findings are consistent with Bukaliya and Mubika (2011) who explored “teacher competences in ICT and its implications for computer education in Zimbabwe secondary schools”, finding that practitioners lacked the necessary skills and knowledge to interact and share with other stakeholders concerning ICT resources which they could embed in their pedagogy. Evans (2014) and Fabros-Tyler (2014) emphasise the importance of this in proposing that principals should carry the technology banner, interact and communicate the values of technology to the staff, learners and community to mobilise ICT resources and enhance student learning experiences with ICTs in the classrooms. Chigona *et al.* (2010) obtained similar findings when they studied factors that hindered educators’ use of ICT pedagogy in Khanya schools of South Africa, finding that insufficient training and a lack of access to ICT facilities were major obstacles to teachers’ ICT integration efforts in their classrooms.

These findings further confirm previous studies by Fu (2013), that although ICTs may be available, they were not yet fully embedded into instructional practices. Similarly, Kabanda (2013) found remarkable variations in the ways ICTs were used and infused into instruction. Kabanda (2013:445) observed that the “literacy levels of educators in Zimbabwean schools ranged from 5% to 80% in certain schools with little evidence of e-learning into curriculum subjects”. Yet, Iaquinta (2015) found that principals with a full understanding of ICT knowledge could promote ICT use in schools. This means that ICT competent leaders can easily enhance ICT learning to improve teacher effectiveness and learner outcomes. This is strongly supported by Khalid and Nyvang (2014), who found that some schools made significant progress in ICT integration into the classrooms while others continue to lag. This study found a striking correlation between the principals’ level of ICT knowledge, perspectives and their ICT leadership practices. This matches studies by Haßler *et al.* (2016b)

who concluded that educators' prior knowledge, values, attitudes and practices influence their practices and experiences with educational reforms, including ICTs.

The findings of this study are significant in establishing the necessary level of ICT competence for principals, showing that a lack of ICT capacity results in ICT decisions being based on financial and technical considerations at the expense of real instructional goals of schools. The study has also confirmed the need for principals to update their ICT knowledge and expertise urgently, as well as transform their leadership roles to become competent ICT leaders. It is evident from these findings that principals' awareness and understanding of ICTs, including knowing what to look for in the classroom in terms of supervision, monitoring, controlling and evaluating the performance of teachers and learners, is important to enhance the effective infusion of ICTs into the curriculum. Razzak (2015) and Seyal (2012) view staff development as the panacea for the challenges faced in integrating ICTs into education. However, the results suggest that the impact of ICTs in schools has so far been limited because principals lack a full appreciation of the nature of ICTs suited to pedagogical practices. The findings are consistent with those of Ndawi *et al.* (2013) who found that although principals were aware of the merits of using ICTs in education, they had limited knowledge of ICTs and lacked a clear sense of direction on how to integrate the tools into the curriculum.

### **5.2.1.2 Perspectives of principals**

Using the three different models of principal leadership combining the distributed, transformational and pedagogical leadership perspectives to investigate and understand the way principals enacted their practices in support of ICT integration, the quantitative data (Appendix B) exposes variations in principals' leadership perspectives. While a few principals opted for distributing their leadership roles and responsibilities, some preferred modelling and inspiring staff, while others adhered to the use of formal authority, imposing decisions from the top. Transformational leadership, likewise, was applied patchily, with high average scores for modelling, holding high expectations and building collaborative teams but also with high standard deviations.

Principals' perspectives therefore varied greatly in terms of ICT integration. The overall average mean score is 2.557 (on a scale of 1 to 5) but the average standard deviation is 1.631, which shows widely varying views about leadership perspectives. Very low scores for distributed leadership indicated that this was the least preferred style of leadership. This is evidenced by the results in Table 37, extracted from Table 20.

Table 37: Views of principals on distributed leadership dimensions

| Item | Dimension of leadership perspective               | Mean | SD    | Mode |
|------|---|------|-------|------|
| 23   | Accomplishing tasks through interactions          | 2.31 | 1.727 | 1    |
| 24   | Giving autonomy to staff                          | 2.26 | 1.359 | 2    |
| 25   | Involving multiple individuals in decision making | 2.20 | 1.262 | 1    |
| 26   | Building collaborative teams/committees           | 3.11 | 1.306 | 1    |

Table 37 indicates that principals had no strong preferences for distributed leadership in support of ICT integration into the school curriculum, although their opinions on using this perspective varied as shown by the high standard deviation of above 1. Further probing during the FGIs revealed that the choice of leadership perspective is governed by the structure of the school system.

The study found that distributed leadership was difficult to apply in highly formalised and structured school systems such as Zimbabwe, where curriculum planning and implementation follows a top-down model and directives are disseminated from the top to bottom for school leaders and teachers to implement. P3 indicated that school heads follow Ministry of Primary and Secondary Education policies about curriculum issues and then direct decisions downwards for teachers to implement. P2 cited examples of policy documents, syllabi, and schemes of work and lesson plans to be adopted as per the new curriculum framework 2015–2022. These observations demonstrate that giving autonomy and empowering staff might be problematic in the Zimbabwean context. Similar findings were echoed in a study of distributed leadership conducted by Day and Sammons (2013), which concluded that cultural and structural barriers operating in schools militated against the implementation of distributed leadership practices.

Focus group interview data also revealed variations in principals' leadership perspectives. To confirm the quantitative findings, in their discussions, principals identified different leadership models that they felt would suit their different contexts, citing contingency or situational leadership, transformational and instructional leadership theories most frequently, while distributed leadership was mentioned sparingly. Principals in the first FGI contended that transformational leadership has the potential to encourage creativity, open-mindedness, team spirit and a context conducive to ICT infusion by teachers who would be inspired to high standards. Against this, McLeod (2015) and Spillane *et al.* (2015) found a case for distributing the roles of ICT leaders to heads of departments, senior teachers, ICT expert teachers and subject specialists. Harris and Jones (2015b) likewise argue that a distributed framework, which involves a cast of others, should be preferred to share ICT knowledge and expertise and to assist those who have challenges in the implementation of educational reforms.

The narratives from the three focus group interviews reveal that they all recognised the ability of principals to choose a suitable leadership model for their specific context. To apply it effectively was a significant leadership decision that could significantly influence the integration of ICTs. Principals' perspectives of ICTs were found to be influential on their decision-making for setting the school mission and vision, strategic plans and ICT infrastructure plans. It is clear from the findings that school principals' leadership style can either enable or hinder teachers' ICT integration efforts. This is in line with Antoniou (2013) and Moore (2016), who assert that principals' perspectives play a pivotal role in leading and managing ICT infusion into teaching. In addition, Godwin *et al.* (2015) and Mingaine (2013a) noted that possessing and demonstrating leadership capacities are strongly determined by the principals' individual perspectives, which is a critical predictor of the successful infusion of ICTs. The meta-analysis carried out by Harris *et al.* (2014) also suggests that the effect of pedagogical leadership is nearly four times that of transformational leadership and distributed leadership perspectives.

### **5.3 Research question 2: What practices characterise the enactment of roles by principals in support of ICT integration in teaching and learning?**

The question sought to establish the practices that characterise the enactment of roles by principals in support of ICT incorporation into teaching and learning. The quantitative and qualitative data indicate that school principals play substantial roles in support of ICT integration in teaching and learning, although there are still variations in the way they enact their leadership. The average mean score of 2.557 and standard deviation of 1.631 in Table 18 suggest substantial variations.

#### **5.3.1 Distributed leadership practices in support of ICT integration**

The study found a strong link between principals' leadership perspectives and their practices. The study identified dimensions of distributed leadership practices (Table 34) that were enacted by less than 30% of principals and which were removed in the factor analysis, leaving only one factor "teachers are organised into teams" for distributed leadership. The extraction score of 0.552 shows that principals played a role in team building by creating teams for integrating ICTs into education. Principals also appreciated the significance of creating teams and committees to promote interactions and to share knowledge and expertise. Interview data shows that principals believe the centralised nature of the school system in Zimbabwe inhibits them from giving autonomy to staff to implement policy as they wish (P2, 27 January 2017). However, delegation was found to be a common practice, although the principal remained right at the top of the school hierarchy, followed by the deputy, senior teachers, heads of departments and teachers, at least in terms of the supervision of instructional practices.

The study findings also suggest that school size and characteristics shaped principals' leadership practices. This confirms the views of Tan and Ong (2011) that variations in leadership practices are related to the size and complexity of ICT integration, while Al shahrani and Cairns (2015) agree that ICT leadership practices correlated with school characteristics. The creation of subject departments led by HODs was determined by the structure of the local school system and the number of

departments was found to depend on the number of subjects offered. During the open ended focus group discussions, it manifested that, the school principal was the highest official in authority at school level. However, the focus group interviews (FGIs) further revealed that a principal's authority alone is considered insufficient to institute changes in an institution effectively, as was also found by Bectaş (2014:1). At the same time, the discussions showed that it is important for everyone to know their duties to avoid conflict (although the duties might overlap, especially for the deputy principal and the principal), and if they are to reap the rewards and benefits of team, collaborative and collective work to implement reform. Bectaş (2014) also notes that teamwork, collective effort and collaborative decision-making in setting school mission and strategic plans are crucial in facilitating the sharing of expertise and ideas for successful policy implementation. According to Goodwin *et al.* (2015), distributed leadership is a prime mechanism for effective ICT integration within schools.

### **5.3.2 Transformational leadership practices for ICT integration**

The quantitative and qualitative results showed that principals valued the use of transformational leadership for ICT integration into pedagogy. The mean scores and standard deviations showed that principals moderately enacted transformational leadership practices in support of ICT integration into instruction. Some mean scores were above 3 while standard deviations above 1 showed variations in the enactment of transformational leadership practices. The qualitative findings also confirm that the principals played three major roles including setting direction, developing staff and redesigning the organisation (Table 34).

The study's findings suggest that most principals enacted transformational leadership practices mainly because it was people-centred, paying more attention to human needs through individual consideration, inspiration and intellectual stimulation. However, the study also found that the principals needed to be competent role models in ICTs so that staff members would emulate them. The findings support Ottestad (2013) and Alenezi (2017a) that transformational

leadership practices have the potential to motivate staff to perform beyond expectations, since the principal would have inspired them to meet high standards.

### **5.3.3 Pedagogical leadership practices in support of ICT integration**

In this study, pedagogical leadership practices were found to be the most prevalent actions undertaken by principals. The quantitative results shown in Table 21 indicated high mean scores in many items that hinged on pedagogical leadership practices enacted in support of ICT infusion into the curriculum. The modes are 4 while the means range from 3.58 to 3.98, showing a high agreement on the roles of school leaders as strategic planners, facilitators, supervisors, team builders, resource mobilisers and supporters in the incorporation of technologies for instructional purposes. At 2.365, the standard deviation was also high, showing variations in the enactment of pedagogical leadership in support of ICTs in their different school contexts. The qualitative results shown in Table 34 summarised the dimensions of pedagogical leadership practices, which were identified by 86.7% of the principals in the focus group interviews. The study found defining the school mission, managing the school ICT programme and creating a positive learning culture were key roles played by school principals to promote the effective integration of ICTs into education.

However, the present study found that there is a lack of technological leadership in public secondary schools in Zimbabwe, hindering the effective integration of ICTs. From the quantitative and qualitative analysis, 65% of the principals did not have ICT visions, missions, strategic plans, budgets or evidence of assessment and evaluation reports for ICTs. The documentary evidence (Table 31) also indicates that most schools were still at their infancy in terms of ICT availability and use. This situation confirms findings by Sun *et al.* (2014) who concluded that no principal has the ability to plan, fund, organise, implement and control successful ICT integration programmes without collaborative teams, unified and clearly communicated visions, technical expertise and the support of all stakeholders, including teacher leaders and the entire community. Hallinger (2012) also recognised these leadership practices, falling under three categories of principals' leadership. In addition, Hallinger *et al.*

(2014) claim that every instructional leader should define a suitable school mission to guide the operation, use all possible dimensions of management and leadership and be able to create a conducive climate with the participation of different departments for the attainment of school goals. This is also supported by Liasidou and Antoniou (2015) who contend that variations in pedagogical leadership practices in ICT are strongly determined by principals' vision for and comprehension of the role of ICTs in education, as well as their individual role in promoting ICTs use and infusion in classrooms. Similarly, the findings of this study confirm the view by Lindqvist (2015) as well as Machado and Chung (2015) that principals, as role models in ICT proficiency and competency, should create sound ICT visions and missions, promote innovation and experimentation and invoke support from all stakeholders who include ICT coordinators and expert teachers with technological content and pedagogical knowledge.

#### **5.4 Research question 3: How do principals enact their practices in support of ICTs in teaching and learning in the schools?**

The major finding was that almost all the principals exhibited a clear understanding of the need to support ICT integration in their institutions but the lack of financial, material, technical and staff development in ICTs hindered their efforts. The principals seemed not to have completely come to terms with the idea that their roles should be transformed from mere school administrators to the multifaceted role of curricular and ICT leaders capable of redesigning the curriculum to implement ICTs, which the vast majority of the principals recognised as necessary.

The study found that although the availability of ICT resources may be important in schools, ICT leadership is even more critical. The findings of the survey, documentary analysis and focus group interviews as well as literature all suggest that ICT can only be effectively implemented in schools if principals actively support it, learn about ICTs and their use and offer sufficient continuous professional development training and support for staff.

However, the quantitative data from the schools' demographics (Table 31) indicated that the provision of ICT infrastructure, resources and professional development training was limited, explaining why their ICT competencies ranged from low to moderate. In terms of the provision of continuous professional development training in ICT, of the 280 school principals surveyed, 54.6% of the schools had ICT policy documents while 45.4% did not. Similarly, 68.1% of the schools surveyed and 66.6% of the principals in the FGIs did not have evidence of professional development programmes for ICTs. The low average mean score of 2.289 and a high average standard deviation of 1.191 demonstrates variable support by principals for ICT use in schools alongside limited provision of professional development focused on ICTs, either at school level or by the Ministry of Primary and Secondary Education. Petko *et al.*(2018) also concluded that continuous professional development programmes should be conducted for teachers to enhance ICT integration, since teachers need to learn the skills and develop an understanding of how and when to incorporate ICTs into their lessons. In view of the observed limited and slow rate of ICT integration into the classrooms in the studied schools, there is a great need for school principals to mount school based supervision programmes where principals, Heads of Departments, teacher mentors and peer coaches can carry out ICT lesson supervision and demonstrations to promote successful implementation of the national ICT policy in public secondary schools. Razzak (2015) also suggests that administrators, heads of department and peer coaches should conduct ICT lesson observations and demonstrations to ensure the successful infusion of ICTs into classrooms.

Narratives from interviews confirm the findings where 78% of the principals lamented their need for staff development training, which they claimed they get from the responsible ministry. Technical, financial and moral support were also limited in these schools as shown by the complaints of the principals on critical shortages of ICT infrastructure, resources, funds, incentives, time, technical expertise and motivation for teachers to embed ICTs for instructional practices effectively. The findings corroborate those findings by Tsakeni and Jita (2017) who concluded that where school leadership failed to provide the needed support for the incorporation of technologies, teachers became demoralised and failed to implement school reforms effectively. Jita and Mokhele (2014) found that when teacher clusters work together

they improve their performance through continuous professional development, thereby increasing learner outcomes in various subjects.

The principals from all three focus group interviews reiterated that infusion of ICTs into the curriculum was heavily constrained by unavailability and irregular electricity supply, insufficient ICT infrastructural equipment and resources, inadequate and inappropriate hardware and software to link with local culture, language to teach indigenous languages such as Shona, Tonga, Ndebele, Tswana, Shangani and other new curricular subjects. The constraints were said to be worsened by the slow speed of ICT development due to unaffordable access to internet connectivity with enough bandwidth. The service providers such as Econet, Telecel, Net One and Tel One were said to be charging unaffordable rates for schools (Interview, 3 in February 2017) to access the internet and website services within their school. It is in this area where the study found that some principals seemed to be oblivious of their supportive roles in ICT use within their schools; hence, they expect the ministry to give all the needed support for them to infuse ICTs in schools. Documentary evidence (Table 32) shows that schools S2, 6, 7, 10, and 11 did not possess staff development plans and ICTs were insufficient as compared to S1.

The findings confirm those of Razzak (2015) that it is the key responsibility of the school leaders to provide all the necessary support for educators to embed ICTs effectively into their classrooms. P11 stated that, “I think Ministry of Primary and Secondary Education should do something to ensure that we get those skills”.

Upon further probing about the support that principals provided for ICT integration into schools, responses revealed that principals were still to learn and understand the ICT policy and find how they should enact their roles to support the effective incorporation of ICTs into the school curriculum. This confirms findings by Ndawiet *et al.* (2013) that critiques the national ICT policy. They argue that Zimbabwe adopted a national ICT policy in 2005 that was informed by Harvard University, guided by an e-readiness survey and it included abstract references to ICTs in education without making special reference to how the ICTs were to be integrated in teaching and learning across the school curriculum.

From this claim, the country adopted an ICT policy in 2005, reviewed it several times in 2012, 2014 and 2016 but the education department did not have a specific one providing them with guidelines on ICT use and integration in various schools, leaving principals with the discretion to infuse or not to embed the tools into their instructional practices. This might explain why there were so many variations on how school principals in this study varied in their opinions about integrating digital tools into education.

The study also found a striking link between ICT leadership and ICT infrastructure, school context and the type of training and time spent on training, all of which could be strategic to ICT related changes across subjects and educational levels in Zimbabwean schools. It was noted that teachers might be hindered from effectively integrating ICTs into their classrooms if they lack all these necessary types of support that should be offered by all school principals in their schools as identified in this study. On the other hand, the study found out that principals, who created a school vision for successful ICT integration and offered staff continuous professional development training that was supportive of ICT infusion into pedagogy, were found to be most successful as exemplified by P1 in Table 4.20. This confirms the views of Gustafson (2014) and Waxman *et al.* (2013) that it is crucial for principals to provide all the essential support needed by staff to infuse ICTs into their lessons effectively. Day and Sammons (2013) argue that school leadership is pivotal in guiding teachers' efforts in infusing ICTs, for example, through providing ICT resource centres with easy access to online services. In contrast to P13, P14 had received ICT training and had been organising similar school-based workshops with his staff. The results confirm Howard *et al.*'s (2015) findings in Kenya on "Teachers' willingness to integrate ICTs in the classrooms", that educators' competencies and mastery in ICT predicted their willingness to integrate ICTs within their instructional leadership activities to improve student achievement.

### **5.5 Research question 4: How can the principals' perspectives on and practices in support of ICT integration in Zimbabwean schools be explained and/ or understood?**

The research question sought answers to understand and explain the principals' perspectives and practices in support of ICT integration in schools. The study utilised three different leadership perspectives to frame the study on principal leadership and ICT integration in teaching and learning in public secondary schools and found that principals' leadership perspectives influence their practices and teachers' effectiveness in integrating ICTs into their instructional practices. The study unveiled findings that suggest that teachers' effectiveness and efficiency would in turn influence student achievement and efficiency of the entire school. The answers for the fourth critical question could be easily obtained after analysing and synthesising all findings from the first three overarching questions 1, 2 and 3. That means, all the data sources which included literature, questionnaire survey, the three open ended focus group interviews and document analysis were closely examined and re-examined to clearly explain and understand school principals' leadership perspectives and practices in support of ICT integration for teaching and learning. The emerging themes of the quantitative and qualitative research displayed in Table 32, which were further explored by means of documentary analysis and the three FGIs, provided more insights to help understand the problem being studied.

A clear interpretation of the link between these variables, as illustrated in Table 35, reveals that principal leadership affects the effectiveness of instructional practices indirectly through teachers and their ICT knowledge and expertise when principals perform the identified eight leadership roles and practices shown as categories. These include setting and communicating a unified ICT vision and managing the ICT curricular programmes, creating collaborative teams and creating a positive learning culture. It is clear from Table 35 that each of these leadership roles and responsibilities are directly connected to specific leadership perspectives such as the distributed, transformational and pedagogical theories that were adopted as a lens to guide the study. A large pool of literature suggests that strong leadership is pivotal to effective ICT-based school innovations because principals' leadership is closely

connected to their incorporation of ICTs into their schools, as argued by McLeod (2015). It can be discerned from the analysis of findings in Table 36 that the principals' roles are ever changing because of the multifaceted roles of curriculum, technological and transformational leaders; hence, principal leadership needs to reconsider redesigning and adapting their leadership perspectives to the new leadership practices that they are expected to perform as ICT leaders.

Scholars such as Abdullah *et al.* (2013:795) share similar views, arguing that principals' perspectives, attributes and behaviours can be used to explain their actions (practices) in policy implementation. Hence, the present study found principals' perspectives to be a significant factor in their integration of ICTs for teaching and learning in their schools.

A close analysis of the perspectives and practices illustrated in Table 36 shows that principal leaders did not rely on a single perspective or practice in their endeavours to promote integration processes of ICTs in education. For example, when setting direction for ICT implementation, the results of the study reveal that all three leadership perspectives, namely distributed, transformational and pedagogical models were used. This finding supports literature that indicates that there is no so-called best leadership perspective (Spillane *et al.* 2015; Harris *et al.*, 2015). This shows that every school requires a convenient style that suits its context. This can explain the variability of responses for the quantitative and qualitative data found in this study.

The study findings reveal that school principals enact various leadership practices that show traits of distributed, transformational or pedagogical leadership perspectives or all the styles. The adopted leadership styles seemed to be influenced by the existing environments. These findings tally with the views of Spillane and Coddren (2015) and Leithwood *et al.* (2010) who concur that there is no best leadership style but each one is only suitable for a particular situation. The findings confirm previous studies by Chang *et al.* (2016) on monitoring ICT use for students' learning outcomes in secondary schools where school leaders and teachers lacked the ICT leadership skills to be able to infuse the tools into education. Tshelane (2015) and Zhang (2014) recommend the development of principal

leadership abilities to assess and monitor the extent to which the infusion of ICTs is being realised. This confirms that the situation calls for urgent professional development and leadership programmes to enable staff to share their ICT expertise and support teachers' efforts (Chang, 2014; Louis *et al.*, 2014).

## **5.6 Conclusion**

Understanding principal leadership perspectives and practices towards ICT integration, their knowledge and level of ICT integration in schools might help to improve the situation where the pace is slow. In accordance with key findings of this study, the status and context surrounding the level of ICT integration in the schools sampled from the country's ten provinces were established. The thesis showed that perspectives of principals influence their practices, which in turn influences teachers' ICT use and integration of ICTs into the school curriculum as well as student achievement. Principal leadership, therefore, plays pivotal roles in setting the stage for successful integration of ICTs in teaching and learning in schools. Furthermore, principals affect students' performance indirectly through teachers. Principals are thus expected to articulate a school ICT vision or mission, implying the need for visionary, distributed, transformational and instructional leadership capacities.

The major principal leadership roles enacted by participants in this study include defining the school mission, managing educational programmes and instruction, creating a positive learning climate, setting direction, developing staff, redesigning the organisation, building a collaborative team, developing teacher leaders, giving staff autonomy and empowerment and involving multiple individuals in decision-making. According to Alenezi (2017a) and Day and Dragoni (2015), the school principals' leadership perspectives governed the enactment of each of these practices. The most prevalent leadership perspective was the pedagogical, followed by transformational leadership while distributed leadership was least preferred and constrained by the centralised nature of the Zimbabwean school system, which relies on top-down models of policymaking. This confirms Hallinger *et al.* (2014) and Day and Sammons' (2013) studies, which concluded that the effect of pedagogical leadership is nearly four times that of transformational and distributed leadership.

This gives limited autonomy to teachers and principals to make decisions, share authority and develop teacher leaders.

However, the study concluded that there was very limited use of these leadership roles and responsibilities by the school leaders, especially for technological integration into the school curriculum, mainly because principals lacked the requisite ICT knowledge and expertise. In addition, principals lacked ICT vision and ICT leadership potential and experience to manage and lead ICT programmes within their institution as per the ICT national policy proposals, a situation that Jita (2016b) and Presby (2017) perceived as a major barrier to the implementation of the ICT policy into education. Principals held mixed feelings about their roles in supporting ICT integration in their schools.

School principals still need to update their ICT leadership skills and knowledge for them to transform the identified leadership roles and become competent and effective ICT leaders. This is because ICT integration requires strong leadership that can facilitate teachers' access to resources. It also requires capacity to lead the efforts of staff members motivating them to work towards achievement of a unified shared ICT vision or mission. Despite the formal leadership training for school leadership, there is a wide gap in formal ICT leadership training for school principals in Zimbabwe.

The study concludes that the pace of ICT integration in public secondary schools in Zimbabwe is still very slow. This was confirmed by the lack of ICT policy documents, visions, staff development programmes, strategic plans, ICT budgets and limited use of ICTs in schools, among principals studied in this research. A close analysis of various data sources ranging from the questionnaire survey, documentary evidence, focus group interviews and literature suggested that schools were still using more of their traditional teacher centred instructional approaches in the classrooms, with little or no application of ICTs into lessons. The availability of school level technical, financial, and moral and staff development training programmes differed from school –to- school. ICT technicians and expert teachers in the areas studied offered voluntary ICT technical support when needed. However, there are remarkable strides being made in some of these schools to infuse ICTs in education. This was

illustrated by efforts made by schools to install websites, WiFi through services providers such as Econet, Net One, Telecel and Teeline, among other internet providers, specifically for instructional practices. Furthermore, principals highlighted the need to be capacitated to become ICT competent leaders who can evaluate ICT programmes and speed up the rate of ICT infusion into classrooms. In view of this scenario, holistic approaches for integrating digital and non-digital resources as well as continuous professional development training that are aligned with a shared vision across all stakeholders are essential.

The principals' vision and ability to mobilise resources, collaboration with staff and other stakeholders to facilitate ICT integration, can increase the rate of ICT use, which is currently slow. As a deputy secondary school principal, working in similar contexts in which the study was conducted, I learnt a lot about how my leadership perspectives can influence my practices in the implementation of educational reforms such as the ICT national policy for education. This has implications in that suitable leadership models are required to match with the existing school situations and requirements. I must readjust and redesign my leadership perspectives and apply them appropriately, according to their relevance to the existing school contexts. I have discovered that although there is no best leadership model that has been prescribed so far, the model that inspires staff to work collaboratively and collectively towards achievement of a common unified and well-communicated vision is preferred. Maximum coordination and support for successful infusion of ICTs was viewed as significant.

The study findings enlightened me on the need to have continuous professional staff development training programmes for acquisition of ICT leadership skills essential for use in the 21<sup>st</sup> century of information technology to improve school effectiveness and efficiency. I realised that it is important to further conduct a needs analysis to establish the gap between available skills and expectations using analysis techniques such as SWOT (Strengths, Weaknesses, and Opportunities and Threats) as well as PESTEL (Political, Economic, Social, Technological, Environmental and Legal) factors. This would enable me to understand the requirements and feasibility of undertaking and applying a strategy in the implementation of new reforms such as the ICT policy for schools.

Finally, I have realised the significance of delegating ICT duties and responsibilities to expert teachers who can act as teacher leaders, mentors and coaches to assist ICT novices in effectively integrating ICTs into education. I tend to concur with Razzak (2015) and Alenezi (2017a) who argue that principals might not necessarily be ICT leaders or assume ICT leadership roles in the integration of technologies for teaching and learning within schools.

## **5.7 Implications and recommendations for practice, policy and future studies**

Based on the key findings and conclusions in this study, the following implications and recommendations are made, specifically focusing on:

1. Principal leadership practice
2. Curriculum policy
3. Future studies

### **5.7.1 Implications and recommendations for practice**

This study has implications for the school leadership practice in ICT integration in schools. It might be significant in guiding school leaders on key roles that they should play in support of the implementation of the ICT national policy for education as well as other policy proposals in educational institutions. It is important for principals to realise that implementation of ICTs in the classrooms is not a once-off process. Thus, a pragmatic, design engineering-based research approach might offer a way of iteratively developing a robust design that can be sustainably implemented in the classrooms, as proposed by Haßler, *et al.* (2016b)

In the first place, the development of the ever-changing roles and responsibilities of school principals because of the fast growth of the information age implies that these principals need to reconsider their leadership perspectives to match them with the new requirements of the current practice. In this regard, the most critical role of the school principal would be to guide staff and facilitate the improvement of their effectiveness through ICT innovations.

In addition, the study acts as a specific reference for school leaders concerning their different leadership and management strategies in support of ICT integration into the school curriculum. Principal leadership should not merely focus on the provision of ICT infrastructure resources but on the application of ICTs in teaching and learning different subjects across the school curriculum. It is imperative for principals to give staff the opportunity to learn how to use technological tools for instructional practices for them to meet school ICT goals. Therefore, schools must design a long-term ICT mission with a vision and goal for the whole system. Schools need to provide complete support and opportunities for all members to learn ICTs and their use in education.

Schools should have strong mechanisms of assessing, monitoring and evaluating themselves and their staff members to control their implementation procedures to meet the set targets. There is also a need for schools to develop collaborative structures and teams that share ICT knowledge and expertise for successful infusion of ICTs into schools.

Even though principals who participated in this study revealed positive perceptions on the use and integration of ICTs for pedagogy, there appears to be a wide gap between their ICT knowledge and expectations as well as their leadership practices and theory. This implies that there is a general need for principals to be provided with all the support to enhance their knowledge and leadership practices in support of ICT integration in their schools. This support includes continuous professional development training in ICTs and their use in education, which can be done through the efforts of teacher leaders as proposed by Jita and Mokhele (2013) as well as Jo *et al.* (2015).

Another option might be to develop online professional learning communities (OPLCs) in ICT training for principals and teachers that Hatlevik *et al.* (2015) view as critical for implementing new reforms. This may also be organised at school, cluster, district, provincial and/or national levels for specific subjects as per the new curriculum policy. This means that teachers and principals in different disciplines such as humanities, sciences, technical and vocational subjects, languages and mathematics may be grouped and trained to become ICT resources people who

would coach and mentor other staff members at their schools. The use of these professional collaborative teams and ICT committees might help principals and teachers to interact informally and formally, sharing ICT knowledge. This creates relevant leadership practices to support the embedding of the digital tools into their instructional practices and to groom teacher leaders who would coach and mentor colleagues in the ICTs integration programmes.

### **5.7.2 Implications and recommendations for policy**

Considering the key findings of the study, the following implications and recommendations can be submitted to decision makers, policy makers and educational authorities responsible for the education system in Zimbabwe and similar school contexts:

Since the study has revealed school-to-school variations in the way principals understand and implement the ICT national policy for education, it therefore, implies that there is a lack of clarity in the way the ICT policy should be implemented in all schools. Therefore, the study recommends that the Ministry of Primary and Secondary Education provide clear policy guidelines on the roles and responsibilities of school leaders and the implementation of the ICT policy in schools.

More relevant continuous professional development training programmes should be organised at various educational levels to equip teachers and principals with requisite ICT knowledge and expertise to be utilised in support of ICT infusion into pedagogical practices.

Findings of this study suggest that curriculum policy designers have not given principals enough orientation to enable them to facilitate the integration of ICTs in teaching and learning. This is confirmed by the fact that most schools did not have the ICT national policy and those with the policy documents showed little knowledge in interpreting them. This created a gap in the way teachers and learners could effectively integrate the technologies into the curriculum as per policy (Zimbabwe

Government, 2015), which recognised ICTs as a cross-cutting theme to be infused in all the subjects.

Furthermore, the teaching of local subjects such as Shona, Ndebele, Tonga, Shangani and others using ICTs was a challenge. Principals complained that they lacked appropriate software to teach local languages. The point was also echoed by Albugami and Ahmed (2015) and Mingaine (2013b) who noted that more communication and re-designing of the policy to suit the local context was necessary, since the policy was guided by an external supplier using the Harvard e-readiness survey without considering their relevance to the local environment. The implication is that policy makers and curriculum designers need to collaborate and work towards producing a contextual ICT policy that is applicable to the Zimbabwean school systems. This might also require consultations and input from other stakeholders such as implementers at the point of service delivery, that is, the educators and their school leaders. It might be important to collaboratively work with implementers of an innovation by including them in all decisions about ICTs so that they accept it and understand its implementation procedures from its inception up to the end.

In terms of dealing with financial constraints, the study recommends that the Ministry of ICT and Courier Services work in collaboration with the Ministry of Primary and Secondary Education to set up support structures and an ICT revolving fund for schools. This may bridge the technological divide that exists between urban and rural schools due to lack of funds, ICT infrastructure, equipment, internet connectivity, technical challenges and quality of hardware and software components.

### **5.7.3 Implication for future studies**

The study provided insight into several routes for future research that include the following:

Firstly, since most of the participants showed a lack of clear understanding of the key roles that they should play in support of the integration of ICTs into the curriculum;

more research is needed to determine the relationship between leadership perspectives and leadership roles in the integration of ICTs into education.

Secondly, to understand the principals' perspectives and practices in support of integration of ICTs in teaching and learning in schools better, more large-scale studies are required. This is mainly because large sample sizes would enable the inquirers to establish any significant links and patterns that might be underestimated in small-scale studies such was the case in this cross-sectional thesis.

Thirdly, researchers have tended to conduct quantitative and qualitative studies on the use of ICTs in education as well as challenges experienced by teachers and students in using ICT tools. However, more research, using mixed-methods designs, is required on principals' ICT knowledge and their leadership perspectives towards ICT integration in primary and secondary schools, including public and private institutions.

The study utilised three different leadership perspectives to frame the study; hence, there is a need to field test a single theory such as the distributed, transformational or pedagogical theories to determine their applicability separately in the Zimbabwean school context.

In addition, future research might be essential to explore further the relationship that exists between school leaders' perspectives and their practices using a longitudinal study.

## **5.8 Limitations of the study**

The study achieved its set objectives in responding to the four critical questions asked in the study. The results of this study increase our understanding of the school principals' leadership vis-a-vis the integration of ICTs in teaching and learning in schools. However, there are important limitations to the study that must be acknowledged.

Firstly, the study relied on self-reporting by the 280 selected participants using various research instruments such as structured questionnaires, open-ended focus group interviews and documentary evidence. Of the expected number of participants, 92.9% completed the questionnaire and 15 volunteered to participate in the three focus group interviews (FGI). The same FGI participants provided me with their documentary evidence on ICT availability and integration into education for triangulation purposes. These participants had different ICT knowledge and perspectives as well as individual demographics such as academic, professional and ICT experiences and expertise posing challenges to compare their ICT integration performances. However, participants were purposively selected to ensure that only information rich sites with relevant data could be used to answer the four research questions for the study.

Another limitation lies in the population type, which were 280 substantive principals from public secondary schools during the period 2010–2016. Findings of the study may not be generalised to other populations such as principals from private and primary schools. However, results of the study could be very fruitful to similar contexts such as public secondary schools in Zimbabwe and elsewhere. The study contributes greatly towards the growing body of scholarship in comparative studies on principal leadership and their enacted roles and responsibilities in support of ICT integration for teaching and learning. The study is therefore important in guiding further inquiry about principals' technological leadership roles in support of teachers' endeavours in embedding the digital devices into their lessons. Other school principals, curriculum designers and policy makers might come up with best approaches to promote the infusion of ICTs into education and student achievement being guided by recommendations suggested in this study.

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## 7. APPENDICES

### APPENDIX 1: ETHICAL CLEARANCE



Faculty of Education

18-Aug-2016

Dear Mrs Rosemary Guvhu

Ethics Clearance: Principal leadership and the integration of information and communication technologies for teaching and learning in Zimbabwe  
Ethics Clearance Number: UFS-HSD2016/1013

Principal Investigator: Mrs Rosemary Guvhu

Department: School of Education Studies (Bloemfontein Campus)

#### APPLICATION APPROVED

With reference to your application for ethical clearance with the Faculty of Education, I am pleased to inform you on behalf of the Ethics Board of the faculty that you have been granted ethical clearance for your research.

Your ethical clearance number, to be used in all correspondence is: UFS-HSD2016/1013

This ethical clearance number is valid for research conducted for one year from issuance. Should you require more time to complete this research, please apply for an extension.

We request that any changes that may take place during the course of your research project be submitted to the ethics office to ensure we are kept up to date with your progress and any ethical implications that may arise.

Thank you for submitting this proposal for ethical clearance and we wish you every success with your research.

Yours faithfully

A handwritten signature in black ink.

Dr. Juliet Ramohai

Appendix 1: Ethical Clearance

## APPENDIX 2: EDITING REPORTS

*Appendix 2: Editing Report*



MASVINGO

### Department of Languages and Literature

25 July 2017

**To whom it may concern**

This serves to certify that Rosemary Guvhu's PhD thesis entitled 'Principal leadership and the integration of information and communication technologies for teaching and learning in Zimbabwe' was edited by an experienced editor. I have edited the thesis and advised the author to effect various changes in the mechanics of language, formatting of text and referencing style. I have worked as an Editor for PhD and MPhil theses for various Universities' students including the Zimbabwe Open University, UNISA and Great Zimbabwe University from 2011 to date. I also edit journals such as the issues of the Journal of African Indigenous Languages and Literature by the Africa Institute for Culture, Peace, Dialogue and Tolerance Studies.

Thank you.

A handwritten signature in blue ink, appearing to read "Isaac Mhute".

Isaac Mhute (PhD)

Zimbabwe Open University

P. O Box 1210, Masvingo

0772856351 / 0738618366

isaacmhute@gmail.com

Home

PO Box 443

Willow Acres Estate

Pretoria, South Africa

0095

Work

Waterford Kamhlaba United World College

Mbabane, Swaziland, H100

12 Nov 2017

**To Whom It May Concern: Editing for Rosemary Guvhu**

This letter serves to confirm that the PhD thesis titled "PRINCIPAL LEADERSHIP AND THE INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES FOR TEACHING AND LEARNING IN ZIMBABWE" has been edited for language.

Over the last four years I have edited approximately twelve Masters and five PhD theses in the fields of Business, Education and Social Science.

Obvious corrections were made in the text, of which there were literally thousands, generally to do with clarity of expression at the sentence level and the need for formal/academic language. More major issues to do with flow, meaning and content were referred back to the author to decide and act upon. The author was also advised to check references for accuracy and consistency, especially where authors had contributed to multiple sources, often in the same year.

Some advice was provided on tabulation and presentation of data but the content remains solely that of the author. After the author had worked on my initial suggestions, the thesis was given a brief final check on 12 November on which day it was emailed back to her.

Yours faithfully



R A Alexander BSc, PGCE, CertMgt, MEd

00268 76155909, [richardalexander@hotmail.com](mailto:richardalexander@hotmail.com)

## **APPENDIX 3: REQUEST TO MOPSE FOR PERMISSION TO CARRY OUT A RESEARCH STUDY**

*Appendix 3: Request to carry out research*

GUVHU Rosemary 2015321512 PHD Management 2016 Cohort 2 University of the Free State

Zaka High School  
P.O. Box 230  
Jerera  
15 July 2016

The Permanent Secretary  
Ministry of Primary and Secondary Education  
P. O. Box 121 CY  
Causeway  
Harare  
ZIMBABWE

**RE: MINISTRY OF EDUCATIONS' LETTER OF PERMISSION TO CONDUCT A RESEARCH STUDY**

Dear Sir/Madam

I hereby request for permission to carry out a research study in your schools. My name is Rosemary Guvhu and I am studying for a Doctoral (PhD) degree with the University of the Free State. As part of my Doctoral programme, I am required to conduct research on an aspect of interest with a view to contributing to our knowledge and understanding of the issues under study. The title of my thesis is:

***Principal leadership and the integration of information and communication technologies (ICTs) for teaching and learning in Zimbabwe***

Your schools from the ten provinces have been chosen to participate by voluntarily contributing suggestions which can assist in guiding the direction and depth of the research. The study explores the roles which school principals play in the integration of ICTs for teaching and learning of different subjects in Zimbabwe's rural schools and how these roles are enacted. The study also examines the knowledge, perspectives and practices which characterise the enactment of their roles in support of the integration of ICTs for teaching and learning within schools.

Your schools have been identified as some of those schools which are implementing the new ICT curriculum policy whose curriculum implementation strategies and practices I would like to observe and learn from. The study has the potential to benefit the entire ministry of education, teachers, learners, policy makers and other principals who are implementing the ICTs curriculum policy, by pointing out the successes, challenges and needs for supporting curriculum implementation in Zimbabwe.

By participating, your schools will benefit from first-hand knowledge of the ongoing research, and be able to test relevant aspects sooner instead of later, while providing feedback. Of equal significance, participants will also be able to influence the direction and outcome of the

research through their contributions. During our initial interview, informants will review a questionnaire survey which in which they will have the choice of completing while we are together or at their convenience.

The study will also involve 3 by 5 participants per group, participating in open ended focus group interviews at a time that is convenient to them; documentary analysis of their ICTs records such as school's vision and mission statements; strategic plans; ICTs policies and implementation plans; annual survey reports; minutes of administrative committee and subject departments; budget plans and school organisational chart as well as archival records of professional development activities and use of ICT facilities and tools in order to understand aspects of ICTs integration into teaching and learning in the school. As per the research protocols, during the open-ended focus group interviews, a recording device will be used with permission from the participants. You will be asked to freely express your views concerning ICTs integration into teaching and learning from the perspective of school leadership and professional development. The interviews are expected to last no more than 45 minutes per session.

To validate the interview, they will be asked to reflect on their leadership perspectives and practices. Such reflection will likely provide us with their invaluable insights concerning the way they would enact their leadership practices in support of ICT integration into teaching and learning within the schools.

Please be assured that our communications and interactions will be risk free and entirely discrete. All data collected from questionnaire survey, documentary analysis and interviews will be treated confidentially, and all the information obtained will be used specifically for research purposes only. At no time will the names of participants be divulged, as per protocol all participants will be assigned a code. Participation is completely voluntary which means that, one can stop or withdraw at any time without negative consequences. I would appreciate your participation, and look forward to your confirmation via the attached consent form. If you want to know the rights of a research participant, please contact my supervisor at the University of the Free State, Faculty of Education E-mail Address [/JitaLC@ufs.ac.za](mailto:/JitaLC@ufs.ac.za) Cell number [+27829083369](tel:+27829083369).

If you have any questions about the research, please feel free to contact me E-mail Address: [rosemaryguvhu@gmail.com](mailto:rosemaryguvhu@gmail.com) Cell no. [+263776102317](tel:+263776102317)

If you understand the contents described above and agree to participate in this research, please complete the attached consent form. Your help is much appreciated.

Yours Sincerely  
Rosemary Guvhu (Principal researcher)  
Faculty of Education: University of the Free State

## APPENDIX 4: PERMISSION GRANTED BY MOPSE TO CARRY OUT RESEARCH

All communications should be addressed to  
"The Secretary for Primary and Secondary Education"  
Telephone: 799914 and 705153  
Telegraphic address : "EDUCATION"  
Fax: 791923



**Reference:** C/426/3 Harare  
Ministry of Primary and Secondary Education  
P.O Box CY 121  
Causeway  
Harare

26 September 2016

Rosemary Guvhu  
Zaka High School  
P.O Box 230  
Jerera

### RE: PERMISSION TO CARRY OUT RESEARCH AT PUBLIC SECONDARY SCHOOLS: 10 PROVINCES

Reference is made to your application to carry out a research at the above mentioned school in 10 Provinces on the research title:

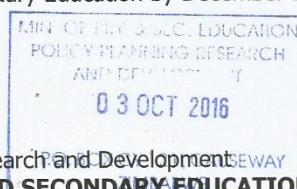
#### "PRINCIPAL LEADERSHIP AND THE INTERGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES FOR TEACHING AND LEARNING IN ZIMBABWE"

Permission is hereby granted. However, you are required to liaise with the Provincial Education Directors who are responsible for the schools which you want to involve in your research. You should ensure that your research work does not disrupt the normal operations of the school. You are required to seek consent of the parents/guardians of all learners who will be involved in the research.

You are required to provide a copy of your presentation and a report of what transpired to the Secretary for Primary and Secondary Education by December 2016.

*F. Fundira*  
F. Fundira (Mrs)

**Acting Director:** Policy Planning, Research and Development  
For: SECRETARY FOR PRIMARY AND SECONDARY EDUCATION  
cc: PED – 10 Provinces



All communications should be addressed to  
"The Secretary for Primary and Secondary Education"  
Telephone: 799914 and 705153  
Telegraphic address : "EDUCATION"  
Fax: 791923



**Reference:** C/426/3 Harare  
Ministry of Primary and Secondary Education  
P.O Box CY 121  
Causeway  
**Harare**

26 September 2016

Rosemary Guvhu  
Zaka High School  
P.O Box 230  
Jerera

**RE: PERMISSION TO CARRY OUT RESEARCH AT PUBLIC SECONDARY SCHOOLS: 10 PROVINCES**

Reference is made to your application to carry out a research at the above mentioned school in 10 Provinces on the research title:

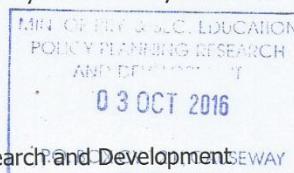
**"PRINCIPAL LEADERSHIP AND THE INTERGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES FOR TEACHING AND LEARNING IN ZIMBABWE"**

Permission is hereby granted. However, you are required to liaise with the Provincial Education Directors who are responsible for the schools which you want to involve in your research. You should ensure that your research work does not disrupt the normal operations of the school. You are required to seek consent of the parents/guardians of all learners who will be involved in the research.

You are required to provide a copy of your presentation and a report of what transpired to the Secretary for Primary and Secondary Education by December 2016.

F. Fundira (Mrs)

**Acting Director:** Policy Planning, Research and Development  
For: SECRETARY FOR PRIMARY AND SECONDARY EDUCATION  
cc: PED – 10 Provinces



## **APPENDIX 5: REQUEST TO SCHOOL TO CARRY OUT A RESEARCH STUDY**

*Appendix 5: Request to carry out research in a school*

Zaka High School  
P.O. Box 230  
Jerera  
ZIMBABWE  
15 July 2016  
The Principal  
Xxx Secondary School (Name of school and address)  
Xxx-----

### **RE: PERMISSION TO CONDUCT A RESEARCH STUDY**

Dear Sir/Madam

I hereby request permission to conduct research in your school. My name is Rosemary Guvhu and I am studying for a Doctoral (PhD) degree with the University of the Free State. As part of my Doctoral programme, I am required to conduct research on an aspect of interest with a view to contributing to our knowledge and understanding of the issues under study. The title of my thesis is:

***Principal leadership and the integration of information and communication technologies (ICTs) for teaching and learning in Zimbabwe***

You have been chosen to participate by voluntarily contributing suggestions which can assist in guiding the direction and depth of the research. The study explores the roles which school principals play in the integration of ICTs for teaching and learning of different subjects in Zimbabwe's public secondary schools and how these roles are enacted. The study also examines the knowledge, perspectives and practices which characterise the enactment of their roles in support of the integration of ICTs for teaching and learning within schools.

You have been identified as one of those school leaders commonly known as school heads who are implementing the new ICT curriculum policy whose knowledge and leadership approaches I would like to observe and learn from. The study has the potential to benefit you and other principals who are implementing the ICTs curriculum policy, by pointing out the successes, challenges and needs for supporting curriculum implementation in Zimbabwe. I am also requesting for permission to interact with you as the school principal commonly known as head to further enhance the quality and scope of the research.

By participating you will benefit from first-hand knowledge of the ongoing research, and be able to test relevant aspects sooner instead of later, while providing feedback. Of equal significance, you will also be able to influence the direction and outcome of the research through your contributions. During our initial interview, you will review a questionnaire survey which you will have the choice of completing while we are together or at your convenience.

The study will also involve open ended focus group interviews at a time that is convenient to you; documentary analysis of your ICTs records such as school's vision and mission statements; strategic plans; ICTs policies and implementation plans; annual survey reports;

minutes of administrative committee and subject departments; budget plans and school organisational chart as well as archival records of professional development activities and use of ICT facilities and tools in order to understand aspects of ICTs integration into teaching and learning in the school. As per the research protocols, during the open-ended focus group interviews, a recording device will be used with permission from the participants. You will be asked to freely express your views concerning ICTs integration into teaching and learning from the perspective of school leadership and professional development. The interviews are expected to last no more than 60 minutes per session.

To validate the interview, you will be asked to reflect on your leadership perspectives and practices. Such reflection will likely provide us with your invaluable insights concerning the way you would enact your leadership practices in support of ICT integration into teaching and learning within the school.

Please be assured that our communications and interactions will be risk free and entirely discrete. All data collected from the questionnaire survey, documentary analysis and interviews will be treated confidentially, and all the information obtained will be used specifically for research purposes only. At no time will your name be divulged, as per protocol all participants will be assigned a code. Participation is completely voluntary which means that, you can stop or withdraw at any time without negative consequences. I would appreciate your participation, and look forward to your confirmation via the attached consent form. If you want to know the rights of a research participant, please contact my supervisor at the University of the Free State, Faculty of Education E-mail Address [/JitaLC@ufs.ac.za](mailto:/JitaLC@ufs.ac.za) Cell number [+27829083369](tel:+27829083369).

If you have any questions about the research, please feel free to contact me E-mail Address: [rosemaryguvhu@gmail.com](mailto:rosemaryguvhu@gmail.com) Cell no. [+263776102317](tel:+263776102317)

If you understand the contents described above and agree to participate in this research, please complete the attached consent form. Your help is much appreciated.

Yours Sincerely

Rosemary Guvhu (Principal researcher)

Faculty of Education: University of the Free State

**CONSENT FORM:**

- I hereby give free and informed consent to participate in the above-mentioned research study
- I understand what the study is about, why I have been appointed to participate
- I understand what the potential benefits and risks are.
- I give the researcher permission to make use of the information collected from my participation for research purposes only.

Participant's Signature----- Date-----

Researcher's Signature----- Date-----

*ALL communications should be addressed to  
"The Provincial Education Director for Primary and Secondary Education"*  
Telephone: 263585/264331  
Fax: 039-263261



ZIMBABWE

Reference: C/426/3

Ministry of Primary and Secondary Education  
P O Box 89  
Masvingo

Rosemary Guvhu  
Zaka High School  
P. O. Box 230  
Jerera

|   |                  |
|---|------------------|
| MINISTRY OF PRIMARY & SECONDARY EDUCATION | 07 November 2016 |
| PROVINCIAL EDUCATION DIRECTOR - PRIMARY   |                  |
| 07 DEC 2016                               |                  |
| P.O. BOX 89, MASVINGO                     |                  |
| ZIMBABWE                                  |                  |
| TEL: 039-263243                           |                  |

**RE: PERMISSION TO CARRY OUT AN EDUCATIONAL RESEARCH IN ALL SECONDARY SCHOOLS IN MASVINGO PROVINCE**

Reference is made to your application to carry out a research at the above mentioned schools in Masvingo Province.

Please be advised that the Secretary for Primary and Secondary Education has granted permission to carry out your research on;

**"PRINCIPAL LEADERSHIP AND THE INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES FOR TEACHING AND LEARNING IN ZIMBABWE".**

You are also advised to liaise with the District Schools Inspector who is responsible for the schools which are part of the sample for your research.

*Z. M. Chitiga*  
Provincial Education Director,  
**MASVINGO PROVINCE**

*Z. M. Chitiga*

|   |             |
|---|-------------|
| MINISTRY OF PRIMARY & SECONDARY EDUCATION | 07 DEC 2016 |
| PROVINCIAL EDUCATION DIRECTOR             |             |
| MASVINGO                                  |             |
| P.O. BOX 89, MASVINGO                     |             |
| ZIMBABWE                                  |             |
| TEL: 039-264331                           |             |
| FAX: 039-263261                           |             |

*B. Chitiga*

|   |             |
|---|-------------|
| MINISTRY OF PRIMARY & SECONDARY EDUCATION | 13 MAR 2017 |
| D.E.O. ZAKA DISTRICT                      |             |
| MASVINGO PROVINCE                         |             |
| P.O. BOX 239, JERERA                      |             |
| TEL: 034-2652                             |             |

## **APPENDIX A: QUESTIONNAIRE**

### **THESIS TITLE: PRINCIPAL LEADERSHIP AND THE INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES FOR TEACHING AND LEARNING IN ZIMBABWE**

#### **ABOUT THIS QUESTIONNAIRE:**

Zimbabwean public secondary schools are currently experiencing the implementation of the new ICT curriculum policy among other curriculum areas. It is on this understanding that, the researcher would like to survey principals about their knowledge, perspectives and practices in the integration of information and communication technologies in teaching and learning of different subjects across the curriculum. The responses are meant to assess school principals' views about the roles which they play in the ICTs integration process within the schools. This information will be used to contribute to the knowledge base about teaching and learning of implementing the ICTs curriculum policy in the Zimbabwean public secondary school context. Additionally, the information may help contribute to the curriculum improvement for ICTs educational issues in public secondary schools.

#### **CONFIDENTIALITY**

Please note that all the information collected through this questionnaire and /or other data collection instruments will be treated confidentially. You are also guaranteed that your name or that of your institution will not be divulged. Codes and pseudonyms will be used instead. Taking part in this study is entirely voluntary and any participant is free to withdraw at any moment if they so wish.

#### **CONTENT OF THE QUESTIONNAIRE**

The questionnaire seeks information about principals' knowledge, perspectives, practices and understandings in the integration of ICTs for teaching and learning in schools.

You should be able to complete this questionnaire in about 45 minutes.

When in doubt about any survey item, or if you have any comments and/or suggestions, do not hesitate to contact the researcher on +263776102317 or my supervisor Professor L C Jita at (051)4017522 or [jitalc@ufs.ac.za](mailto:jitalc@ufs.ac.za)

If you understand the contents described above and agree to participate in this research, please complete the attached consent form. Your help is much appreciated.

#### **CONSENT FORM:**

- I hereby give free and informed consent to participate in the above-mentioned research study
- I understand what the study is about, why I have been appointed to participate

- I understand what the potential benefits and risks are.
- I give the researcher permission to make use of the information collected from my participation for research purposes only.

Participant's Signature----- Date-----

Researcher's Signature----- Date-----

**Thank you in advance for your acceptance to participate in this survey!**

#### **Demographic and organizational characteristics of the respondents**

**N.B.** May you please provide your responses by putting a tick in the appropriate box which corresponds to your answer in the table (Appendix A Section A i-viii)

| <b>Demographic features</b>          | <b>Category</b>                  | <b>Frequency</b> | <b>Percentage</b> |
|--------------------------------------|----------------------------------|------------------|-------------------|
| Gender                               | Male                             |                  |                   |
|                                      | Female                           |                  |                   |
| Age                                  | 25–34                            |                  |                   |
|                                      | 35–44                            |                  |                   |
|                                      | 45–54                            |                  |                   |
|                                      | 55–64                            |                  |                   |
| Experience as a principal            | 1–5                              |                  |                   |
|                                      | 6–10                             |                  |                   |
|                                      | 11–15                            |                  |                   |
|                                      | Other                            |                  |                   |
| Principals' qualification            | Certificate/Diploma in Education |                  |                   |
|                                      | Certified University Graduate    |                  |                   |
|                                      | PhD                              |                  |                   |
| Principals' experience with ICTs     | 1–5                              |                  |                   |
|                                      | 6–10                             |                  |                   |
|                                      | 11–15                            |                  |                   |
|                                      | 16+                              |                  |                   |
| Principals' ICT expertise            | Novice                           |                  |                   |
|                                      | Intermediate                     |                  |                   |
|                                      | Expert                           |                  |                   |
| Existence of ICT policy documents    | Yes                              |                  |                   |
|                                      | No                               |                  |                   |
| Staff development programmes for ICT | Yes                              |                  |                   |
|                                      | No                               |                  |                   |

**Thank you very much for your contribution in this survey!**

| 1 A | Principals' ICTs  | knowledge | and | Skills |   |     |
|-----|---|-----------|-----|--------|---|-----|
| No. | Variable  | SA        | D   | U      | A | S A |
| 1   | Ability to use word processing for teaching and learning                    | 1         | 2   | 3      | 4 | 5   |
| 2   | Ability to use internet for educational purposes                            | 1         | 2   | 3      | 4 | 5   |
| 3   | Ability to use databases for instruction                                    | 1         | 2   | 3      | 4 | 5   |
| 4   | Ability to create and send emails for educational business                  | 1         | 2   | 3      | 4 | 5   |
| 5   | Use of WhatsApp messages to communicate with staff on administrative issues | 1         | 2   | 3      | 4 | 5   |
| 6   | I can prepare school programmes and time tables using ICTs                  | 1         | 2   | 3      | 4 | 5   |
| 7   | Use of web sites make budgets and purchase resources for the school         | 1         | 2   | 3      | 4 | 5   |
| 8   | I have received Ministry of Education training in ICTs for instruction      | 1         | 2   | 3      | 4 | 5   |
| 9   | I can provide Continuous Professional Development on ICTs to teachers       | 1         | 2   | 3      | 4 | 5   |
| 10  | Sharing ICTs with colleagues in education                                   | 1         | 2   | 3      | 4 | 5   |
| 11  | I can use ICT for collaborating with staff, students and community          | 1         | 2   | 3      | 4 | 5   |
| 12  | Ability to assess situations suitable for ICTs use in classrooms            | 1         | 2   | 3      | 4 | 5   |
| 13  | I can use ICTs for assessment and staff supervision to improve instruction  | 1         | 2   | 3      | 4 | 5   |
| 14  | Select and suitably use ICTs as pedagogical tools                           | 1         | 2   | 3      | 4 | 5   |
| 15  | I can give teachers ICTs training   | 1         | 2   | 3      | 4 | 5   |
| 16  | Use ICTs for management and leadership practices                            | 1         | 2   | 3      | 4 | 5   |
| 17  | I have enough ICTs skills and knowledge                                     | 1         | 2   | 3      | 4 | 5   |
| 18  | I can integrate ICTs into instructional practices                           | 1         | 2   | 3      | 4 | 5   |

| 19    | I can routinely integrate ICTs into the curriculum            | 1                 | 2        | 3         | 4     | 5              |
|-------|---|-------------------|----------|-----------|-------|----------------|
|       | AVERAGES  |                   |          |           |       |                |
| No.Bi | Distributed leadership dimensions                             | SD                | D        | U         | A     | SA             |
| 20    | Using distributed leadership for sharing digital lesson plans | 1                 | 2        | 3         | 4     | 5              |
| 21    | Allowing teachers to develop own digital resources            | 1                 | 2        | 3         | 4     | 5              |
| 22    | Learners decide own ICTs for instruction                      | 1                 | 2        | 3         | 4     | 5              |
| 23    | Teachers are organised in subject teams                       | 1                 | 2        | 3         | 4     | 5              |
| 24    | Empowering teachers through ICTs                              | 1                 | 2        | 3         | 4     | 5              |
| 25    | Facilitating collaboration through ICTs                       | 1                 | 2        | 3         | 4     | 5              |
| 26    | Distributing leadership across formal and informal leaders    | 1                 | 2        | 3         | 4     | 5              |
| 27    | Involving multiple individuals in ICT decisions               | 1                 | 2        | 3         | 4     | 5              |
| 28    | Giving teachers autonomy in ICTs                              | 1                 | 2        | 3         | 4     | 5              |
| 29    | Accomplishing leadership through teachers                     | 1                 | 2        | 3         | 4     | 5              |
| Bii   | Transformational leadership                                   | Strongly disagree | Disagree | Undecided | Agree | Strongly Agree |
| 30    | Setting direction   | 1                 | 2        | 3         | 4     | 5              |
| 31    | Developing and communication ICT vision                       | 1                 | 2        | 3         | 4     | 5              |
| 32    | Prioritising development of shared beliefs                    | 1                 | 2        | 3         | 4     | 5              |
| 33    | Building consensus among staff about ICT                      | 1                 | 2        | 3         | 4     | 5              |

|      | goals  |                    |            |            |       |                |
|------|--|--------------------|------------|------------|-------|----------------|
| 34   | Developing staff   | 1                  | 2          | 3          | 4     | 5              |
| 35   | Stimulating teachers about ICT integration                           | 1                  | 2          | 3          | 4     | 5              |
| 36   | Redesigning the organisation   | 1                  | 2          | 3          | 4     | 5              |
| 37   | Holding high expectations for teachers                               | 1                  | 2          | 3          | 4     | 5              |
| 38   | Building collaborative structures for ICTs integration               | 1                  | 2          | 3          | 4     | 5              |
| Biii | Pedagogical leadership   | Strongly disagreed | Disagree   | Undecided  | Agree | Strongly Agree |
| 39   | Giving individual teachers laptops                                   | 1                  | 2          | 3          | 4     | 5              |
| 40   | Routinely integrating ICTs   | 1                  | 2          | 3          | 4     | 5              |
| 41   | ICTs are accessible and adapted to all includingspecial needs groups | 1                  | 2          | 3          | 4     | 5              |
| 42   | Defining school mission  | 1                  | 2          | 3          | 4     | 5              |
| 43   | Schedule is organised for ICT lessons                                | 1                  | 2          | 3          | 4     | 5              |
| 44   | Allocating funds for ICTs teachers to coach others                   | 1                  | 2          | 3          | 4     | 5              |
| 45   | Managing the ICT curriculum  | 1                  | 2          | 3          | 4     | 5              |
| 46   | Assessment is done to improve learners' progress                     | 1                  | 2          | 3          | 4     | 5              |
| 47   | Coordinating and communicating staff progress                        | 1                  | 2          | 3          | 4     | 5              |
| 48   | Providing incentives for using ICTs                                  | 1                  | 2          | 3          | 4     | 5              |
| 49   | Creating a positive learning culture                                 | 1                  | 2          | 3          | 4     | 5              |
| 50   | Maintaining high visibility  | 1                  | 2          | 3          | 4     | 5              |
| 2    | Practices enacted by   | Principals         | In support | Of ICT use |       |                |
| No   | Variables  | Strongly disagree  | Disagree   | Undecided  | Agree | Strongly Agree |
|      | Distributed leadership practices                                     |                    |            |            |       |                |

|    |  |   |   |   |   |   |
|----|--|---|---|---|---|---|
| 51 | Distributing leadership functions across formal and informal leaders     | 1 | 2 | 3 | 4 | 5 |
| 52 | Involving multiple individuals in ICT decision making processes          | 1 | 2 | 3 | 4 | 5 |
| 53 | Accomplishing leadership tasks through interacting with various teachers | 1 | 2 | 3 | 4 | 5 |
| 54 | Giving teachers autonomy to implement the ICT policy as they wish        | 1 | 2 | 3 | 4 | 5 |
|    | Transformational leadership practices                                    | 1 | 2 | 3 | 4 | 5 |
| 55 | Setting direction  | 1 | 2 | 3 | 4 | 5 |
| 56 | Developing staff   | 1 | 2 | 3 | 4 | 5 |
| 57 | Redesigning organisation   | 1 | 2 | 3 | 4 | 5 |
|    | Pedagogical leadership practices   |   |   |   |   |   |
| 58 | Defining school mission  | 1 | 2 | 3 | 4 | 5 |
| 59 | Managing the school ICT curriculum                                       | 1 | 2 | 3 | 4 | 5 |
| 60 | Creating a positive learning culture                                     | 1 | 2 | 3 | 4 | 5 |

## APPENDIX B: DOCUMENTARY EVIDENCE PROTOCOLS

| No | Item                   | P<br>1 | P<br>2 | P<br>3 | P<br>4 | P<br>5 | P<br>6 | P<br>7 | P<br>8 | P<br>9 | P<br>10 | P<br>11 | P<br>12 | P<br>13 | P<br>14 | P<br>15 | N | % |
|----|------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---|---|
| 1  | Gender                 | M      | F      | M      | M      | M      | M      | M      | F      | M      | M       | M       | M       | M       | M       | F       |   |   |
| 2  | Age                    |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |   |   |
| 3  | Principals' experience |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |   |   |
| 4  | ICT policy             |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |   |   |
| 5  | Staff development      |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |   |   |
| 6  | ICT budgets            |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |   |   |
| 7  | ICT delegated duties   |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |   |   |
| 8  | ICT timetables         |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |   |   |
| 10 | Visions/Missions       |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |   |   |
| 11 | ICT strategic plans    |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |   |   |
| 12 | Computers              |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |   |   |
| 13 | Computer labs          |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |   |   |
| 14 | Printers               |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |   |   |
| 15 | Projectors             |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |   |   |
| 16 | Computer room access   |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |   |   |
| 17 | Internet               |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |   |   |
| 18 | Websites               |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |   |   |
| 19 | Digital camera         |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |   |   |
| 20 | Television             |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |   |   |
| 21 | Radio                  |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |   |   |

## APPENDIX C: FOCUS GROUP CODES

### OPEN-ENDED FOCUS GROUP INTERVIEW (FGI) Pseudonyms and codes:

| Secondary School | Focus Group            | Pseudonyms | Duration     |
|------------------|------------------------|------------|--------------|
| S1               | ONE (5 Interviewees)   | P1         | 55.1min<br>s |
| S2               |                        | P2         |              |
| S3               |                        | P3         |              |
| S4               |                        | P4         |              |
| S5               |                        | P5         |              |
| S6               | TWO (5 Interviewees)   | P6         | 51.3min<br>s |
| S7               |                        | P7         |              |
| S8               |                        | P8         |              |
| S9               |                        | P9         |              |
| S10              |                        | P10        |              |
| S11              | THREE (5 Interviewees) | P11        | 54.5min<br>s |
| S12              |                        | P12        |              |
| S13              |                        | P13        |              |
| S14              |                        | P14        |              |
| S15              |                        | P15        |              |

**THESIS TITLE:** Principal leadership and the integration of information and communication technologies for teaching and learning in Zimbabwe

**Time of interview:** Convenient to the participants.

**Date:** Different dates for the three groups

**Interviewer:** Rosemary Guvhu

**Interviewees:** School Principals

**Position of interviewer:** Principal Investigator

#### Introductory section

Introductory session (researcher and interviewees introduce each other, thanking the participants for accepting to participate in the focus group interviews. I further clarify to the participants the purpose of the study, assuring them of anonymity of names and confidentiality of their responses.

### **CONSENT FORMS:**

If you understand the contents described above and agree to participate in this research, please complete the attached consent form. Your help is much appreciated.

- I hereby give free and informed consent to participate in the above-mentioned research study
- I understand what the study is about, why I have been appointed to participate
- I understand what the potential benefits and risks are.
- I give the researcher permission to make use of the information collected from my participation for research purposes only.

Participant's Signature \_\_\_\_\_ Date \_\_\_\_\_ Phone number \_\_\_\_\_

Participant's Signature \_\_\_\_\_ Date \_\_\_\_\_ Phone number \_\_\_\_\_

### **Asking participants about their demographic characteristics**

Researcher asks the respondents their background information which includes their years of teaching experience, how long they have been at their stations and their technology availabilities within their schools.

### **Principals' leadership knowledge and perspectives in ICTs integration**

1. Which ICTs applications are you able to apply in your instructional activities within your school?
2. How much training have you acquired about the use and integration of technologies for teaching and learning into the school curriculum?
3. To what extent do you think your school is adequately prepared, in terms of ICT skills and resources for using and incorporating ICTs for teaching learning in the daily lessons?
4. (a) Which leadership approaches do you prefer to use in support of the integration of ICTs for teaching and learning in of different subjects across the school curriculum?  
(b) Could you please highlight the reasons for your preferred leadership strategies?

### **Principals' leadership practices in ICTs integration into schools**

5. In your opinion, what major duties and responsibilities do you normally perform in support of the integration of ICTs into the school curriculum?

6. How do you as a principal, support your staff in their efforts to use and incorporate ICTs for teaching and learning within their classrooms?

### **Understanding principals' leadership perspectives and practices**

7. Verifying, triangulating and integrating all data sources used in the study to establish the linkages between principals' perspectives, practices and their implementation of ICTs into pedagogy
8. Checking and analysing evidence from literature, survey data, interviews and documentary evidence to establish beliefs, attitudes, leadership and actions of principals towards ICT integration into teaching and learning? The full story of the study was clearly shown after deeply analysing all data sources; hence no specific questions were asked in question 4.

N.B Feel free to ask any question or comment on the issues which we have discussed.

**THANK YOU FOR YOUR TIME!**