High achievers in the Integrated Quality Management System (IQMS) and their perceptions of the role of Information and Communication Technologies (ICT) in their teaching.

by

LORRAINE NOMBUYISELO MABITSELA

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Supervisor: Dr G Lautenbach

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I, Lorraine Nombuyiselo Mabitsela, declare that the work in this mini-dissertation is original (except where citations and acknowledgements indicate otherwise). No part of this work has been, or will be, submitted in any form as part of another degree at this, or any other University.

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AUGUST 2010
DEDICATION

This mini-dissertation is dedicated to my husband

ARTHUR GOPOLANG MABITSELA

My heartfelt and deepest gratitude goes to my husband, Arthur Gopolang, for his belief in me and his understanding throughout my studies and the completion of this dissertation.

My husband you compromised your own studies so that I can pursue this degree and understood how important it was for me to finish this degree. You spent sleepless nights assisting me with typing and printing of my work. This degree drained us financially but you kept on encouraging me not to give up. I could not have come this far had it not been for your love and support

You took full responsibility of our son Arthur Gopolang Jnr when I was deeply buried in my work. I appreciate all the sacrifices you made so that I could complete my study and once more, thank you for being there.
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CHAPTER 1

1.1 INTRODUCTION

Changes in the South African education system, following the transition to a more representative democracy, were influenced largely by political and economic factors aimed at helping the country to compete in the global economy. Transformation from a non-democratic to a democratic dispensation made it necessary for the South African Department of Education to review existing policies in order to transform schools into high performing organisations. One example of such legislation, which was aimed at transforming education into a high performing system, is the South African School Act no 84 of 1996. This act stipulates that the country requires a national system which will provide education of a progressively high quality to lay a strong foundation for the development of all learners.

A new revised curriculum that aimed at making the learning process more interesting for both teachers and learners was introduced in 2002. This revised curriculum was influenced by the principles and practices of democracy which encapsulates the vision for teachers and learners who are knowledgeable and multifaceted. This curriculum will give birth to learners who will be able to bring different skills including computer skills and learning styles to the learning process (Chan, 1995, in Semple). Before then, teachers were mainly concentrating on preparing learners for examinations (teaching towards examinations) instead of focusing on instructional content and objectives (Dutt, 2009: online). This meant that the quality of education was hugely compromised. Serious attention had to be given to the curriculum and as a result the South African Qualifications Authority (SAQA) was tasked to establish the National Qualifications Framework (NQF). This framework specifies the outcomes to be achieved in all education and training programmes. Therefore a shift was expected away from the teacher-centred system of education to a more learner-centred one which is guided by the constructivist principles. According to Chapman and Mahlk (2006, p298) teacher-
centred activities are moved to a more student-centred as this is supportive of the constructivist learning theory where students are expected to research information, analyse data and draw their own conclusions.

This revised curriculum has constructivist strands in it because learners are more involved in their learning. The new curriculum no longer treats learners as recipients of knowledge from their teachers but focuses on learners as individuals who are able to construct their own knowledge. The teacher is expected to recognise and support appropriate learning environments according to the child’s cognitive state so that learners can construct their own knowledge (Semple 2000, online). This curriculum expects an educator to take the role of guiding and facilitating rather than be the director of instruction. Constructivist theory is based on the knowledge that the teacher provides supportive framework for the student to acquire skills by accessing appropriate resources. Thereafter the teacher gradually removes this support in a process of encouraging the learner to become increasingly independent in solving problems (Semple 2000, online). Collins further explains that learning takes place in a context relevant to the learner. Therefore an educator in this new curriculum must plan according to contextual factors so that a learner can make meaning out of that information, as knowledge resides in the mind of the learner.

Within this framework, it became necessary to focus attention on the low motivation level of educators which was impacting negatively on learner performance. There was a growing need for the introduction of a system that would uplift the morale of the teaching fraternity. The proposed system was to be responsible for the assessment of educator competence, the provision of incentives for good performance, and the provision of support where needed. Performance assessment of this nature for educators was meant to help provide feedback to employees and encourage improvement in performance by setting measurable goals (Grote, 2002, p5). The purpose of assessing educators in this way was to promote accountability in meeting the educational needs of learners. According to Bush and West-Burnham (1994, p311) teachers should be accountable for the learning outcomes and the processes leading to those
outcomes. In other words, educators need to be responsible for the quality of their work and be aware of the huge impact of their interventions on the learning outcomes.

The need for quality education in South Africa, therefore, resulted in the introduction of the Integrated Quality Management System (IQMS) which was informed by a schedule of the Employment of Educators Act, No 76 of 1998. In this act, the Minister of Education is required to determine performance standards for educators who are subjected to evaluation. This can be seen as a planned action for growth and development as envisaged in the Education Labour Relations Council (ELRC) Collective Agreement No 8 of 2003. The IQMS consist of three programmes which focus on developing both the school and the educator. IQMS assures quality education which the country desperately needs. Accordingly, the main aim of the IQMS is to determine competence, evaluate strengths, make recommendations on areas that need development, provide accountability for the overall effectiveness of the institution, and to promote professional growth of educators.

As part of this professional growth, the individual educator is now expected to evaluate the quality of his or her work. Quality Management (QM) means that educators are faced with the task of evaluating and improving the quality of their work which has a huge impact on how they manage their teaching. Blyth (in Bush & West-Burnham 1994, p123) declared that teachers must always remember that children’s learning is more important than teacher’s teaching. Thus it is the responsibility of each individual educator to ensure that they achieve quality through continuous improvement (Bush & West-Burnham 1994, p127). Improving quality involves different areas, not only teaching. Record keeping and planning demand that the educator must now review the way he/she manages work in order to improve overall quality. It might be viewed as a great challenge by many educators, but the fact remains that educators have to continuously improve their practice and keep up to date with modern trends in education.
1.2 THE BACKGROUND OF THE STUDY

As an educator who achieved a first position in the category of Excellence in Primary School Teaching at the National Teacher Awards in 2007, I was approached by my school to fulfil a leadership role when the question of teacher quality arose. With the implementation of the IQMS for the first time in 2004, schools were expected to democratically elect their School Development Team (SDT). I was subsequently elected to take up the responsibility of a coordinator of the SDT. The main responsibility of the SDT as stated in ELRC (2003, p12) is to coordinate the development cycle and ensure that the IQMS is applied consistently. As the coordinator of the SDT, I was to ensure that a needs analysis of the institution was conducted in order to identify areas that needed attention. Educators received training on the implementation of the IQMS and several workshops were then conducted.

There are numerous pull and push factors associated with the IQMS programme. The push factors include a teacher’s need to be accountable and take responsibility for their work. The grade 12 results are still the main push force for high schools that are judged according to learner performance at this level. The pull factors include monetary incentives. Monetary incentives are given in the form of a one percent salary progression if the educator exceeds the following scores: Post level one educators, 56; post level two educators, 84; post level three and four educators, 104 (ELRC 2003, p20). This kind of performance evaluation involves judging the educator, through an internal or external formative process designed to provide feedback on the total impact and value of a project or activity (Bush & West-Burnham 1994, p58). Teacher unions are playing a major role in ensuring that educators are not exploited during the IQMS process. According to Nxesi (2005, online) the aim of the IQMS, developed with the assistance of the unions, is to appraise teachers regularly in order to identify and address their weaknesses, to reward good performance and to provide the minister of education with a measure of the health of the schooling system.
1.3 THE PROBLEM STATEMENT

Teachers in my school have started to notice the importance of computers in their teaching. From personal observations, it appears that one of the challenges facing most educators is the lack of information and communications technology (ICT) skills, which in turn has a negative impact on their teaching and, I argue, on their scores during the IQMS appraisal. High achievers on the IQMS appraisal, on the other hand, seem to be better equipped with ICT skills. The purpose of this study is, therefore, to determine how high achievers on the IQMS perceive the role of computer technology in their practice as teachers. Against this background, the research question can be phrased as:

How do high achievers on the IQMS perceive the role of computer technology in their teaching?

1.4 THE AIM AND OBJECTIVES OF THIS STUDY

The main aim of the study is: To establish how high achievers on the IQMS perceive the role of computer technology in their teaching

To link IQMS performance standards with ICT competences
To determine, during the empirical component of this inquiry, how high achievers on the IQMS appraisal perceive the role of ICT in their teaching
To represent individual stories of ICT integration in the format of traditional African stories that may be more relevant to the broader African public.

1.5 RESEARCH DESIGN

In this study, a qualitative research approach will be used. Qualitative studies usually aim for depth that gives a clear and detailed account of actions and representations of actions. This inquiry is conducted in a setting bound by the theme of the inquiry (Henning, Van Rensburg & Smith, 2004, p3). Qualitative
research involves going into the field, into the real world and getting close enough to the people and circumstances there to capture what is happening. As a qualitative researcher, I believe that meaning is “socially constructed by individuals in interaction with their world” (Merriam, 2002, p3). The main reason for choosing a qualitative approach is that it will allow me as researcher to capture participants’ views on the role of technology in their work as educators. This qualitative research involves my interpretation of the participants’ responses and how I interpret or understand the phenomenon (Merriam, 2002, p25). As a qualitative researcher, I will be the primary instrument for data collection and analysis.

1.6 THE MULTIPLE CASE STUDY

The design of this study is a multiple case study; it will look at multiple cases of six educators, each one practicing within their own unique context at their school and engaging with the tools of ICT. In this multiple case study, each case may present a different thematic finding as the research progresses. The cases will provide a detailed description of the theme under study (Creswell 1998, p 63). The six cases involve individual teachers. Each case, in turn, is an intensive description and analysis of an individual (Patton 2002, p297; Merriam 2002, p3) which will be presented as a story. The six educators will tell their own stories based on their experiences with ICT tools. Storytelling as cultural representation and sociological text emerges from many traditions, and it is becoming more common in the line of work called narrative inquiry (Stake, in Denzin & Lincoln 2003, p144). I will take elements of traditional stories and combine them into a new narrative for each participant. Stake supports this notion and concurs that each person will tell their own story, but the researcher can decide what will be included in the story.

The stories will be told in the style of traditional South African storytelling, popularised by well known figures such as Gcina Mhlope and Credo Vusamazulu Mutwa. These storytellers have become famous for their documentation of Africa’s rich cultural history which has been passed down verbally over the ages (Hlatswayo, 2010). The stories I will use are unique, but the most interesting part about them is how they will be communicated. In African culture, such stories are
usually narrated by elders of the family sharing them with grandchildren. They are often used to teach morals and values using characters such as animals and ancient figures. This oral tradition is passed from one generation to the next. These stories, rich in idiom and poetry, are difficult to translate into languages such as English, but in this inquiry I will merely use the rough story outlines to illuminate the issue of ICT integration into teaching and learning. I will do this in order to make stories of ICT integration more accessible to the African ‘man in the street’.

According to Clandinin and Connelly (2000) stories are told according to how humanity experiences the world. Each participant in this inquiry, individual teachers who have scored highly on the IQMS evaluation, will tell their own story in individual interviews that will be analysed and reconstructed into stories with a traditional theme. Their narrated stories, will be social constructions (created through collaboration with individual participants) that I will use to shed light on the role of ICTs in the teaching and learning of the six participants.

The aim of telling these stories is to emphasize the use of ICTs within the unique social context of the Gauteng school. These stories will benefit other African teachers (and other interested parties) who want to learn more about the use of ICT in teaching and learning. Narratives can be seen as a determinant of meaning that will be used to search for construction and maintenance of the directive discourses in the narrative texts (Lautenbach, 2005; Henning et al, 2004, p42 Merriam, 1998, p158). For this reason, I see these narratives as potentially useful research tools to complement the use of a multiple case study design.

Choosing a multiple case study design will afford me the opportunity to meet various participants and collect data through interviews, observations and document analysis. This in turn will help with understanding the environment in which the high achieving teachers are working and how they perceive the role of educational technologies on their performance as educators.
1.6.1 Sampling

Sampling is a term normally associated with quantitative research and is defined as the means to make a selection from a sampling frame, in order to identify people or issues to be included in the research (White 2003, p114). Purposive sampling will be used in this study to select information rich cases that would illuminate the question under study. **The participants of this study will be six educators who achieved high scores during the IQMS process in 2005, 2006 and 2007.** Some of the teachers in this study have extensive knowledge of computers while others only know computer basics, but all participants are computer literate. The overarching criterion for selection, however, is the **high score on the IQMS.**

This study includes participants from two Districts, namely Johannesburg West (D12) and Johannesburg South (D11). It will include teachers from one primary school and three high schools. A further criterion used in the deliberate selection of these individuals is that they all have access to computer centres that are utilised by both educators and learners.

1.6.2 Data Collection

**Interviews, informal observations** and **document analysis** will be used in this study as methods of collecting data. Patton (2002, p248) emphasizes the advantage of using multiple methods for data collection in which different types of data provide cross–data validity checks. Triangulation of method strengthens a study by combining different methods. As researcher, I will attempt to gather information `through the use of a variety of sources to further increase the reliability of the data (Patton, 2002, p247; White, 2005, p89).

According to White (2005, p14) an **interview** provides access to what is inside a person’s head, and makes it possible to measure what a person is thinking. Salkind (1997, p214) further explains that one can note the interviewee’s non-verbal behaviour, the setting and other information that might prove valuable. Open ended interviews with individual participants will be conducted so that each
participants can freely tell his/her own story without feeling intimidated by the other
participants responses. Open-ended interviews require careful wording of each
question before the interview (Patton, 2005, p344). Since the six participants will
be interviewed separately, all questions will be asked using similar wording for
each interviewee. During the interview process, I will create a positive environment
for the participants so that they will feel free to share their experiences on how
they utilise ICT in their teaching. These interviews will be presented as narratives.
In order to develop the narratives, individual interviews will be conducted with each
of the six participants telling their own stories. These interviews will include
questions regarding their experiences during the IQMS cycles

**Observations** as stated by Patton (2002, p263) have many advantages in that the
inquirer is better able to understand and capture the context within which people
interact. Furthermore, the participant observer can also discover things no one
else has ever really paid attention to. Observations provide a firsthand encounter
with the phenomenon during which field notes will be taken. The participants will
be observed during a normal teaching day as they go about their practice as
educators. Observing the participants will assist in finding out what was missed
during the interviews or to highlight certain aspects that were unclear. Henning,
van Rensburg & Smit (2004, p82) advise that it is wise for the researcher to keep
in mind the importance of meticulous crafting and recording of the observed site.

The observation schedule plays an important role because it guides the
researcher about the specific areas that needs to be focused on. According to
Patton (1990, p265) observation provides knowledge of the context in which
events occur and enable the researcher to see things that may be obscured from
the participants. The strength of observation is that the researcher will be able to
experience the teaching environment and also be exposed to the teaching media
and worksheets that are designed by the participants. It is an opportunity to
observe how learners respond to the participants teaching. The response of the
learners is important for IQMS purposes because performance standards (PS) 1 to
4 (discussed in chapter 2) are standards and (PS) 1 to 4 (discussed in chapter 2)
are based on classroom activities.
Creswell (1998) refers to the schedule as a key informant that will help the researcher to gather data, but advises that it is important for the researcher to identify who or what to observe and when. It is also important to have observation protocol as a method for recording notes. I will prioritise by focusing on the areas where integration of computers is evident in promoting effective teaching and learning, but the main area of focus in this study is the venue (computer laboratory) where the six participants spent most of their time working. I will however not restrict myself by limiting the areas that will be observed. Even though the observation schedule is very important, there are other issues that can emerge that might benefit the study and themes and insights may start to emerge. Gray (2004, p245) advises against self-censorship at this stage try and encourages the recording of everything that occurs to you in the field.

**Documents** used during IQMS will form an important part in the collection of data. Performance measurements (PM’s) used during the staff evaluations identify educator’s strengths and weaknesses. The strength of documents as a data source lies in the fact that they already exist in the situation and do not intrude upon or alter the setting in ways that the presence of the investigator might (Merriam 2002, p13). Other documents that I will use will be work schedules and lesson preparations, documents such as teaching media are also important. These documents will be of great help because they will have been created by the participants.

### 1.6.3 Data Analysis

Data analysis, which involves transforming data into findings (Patton, 2002, p432), will include verbatim transcription of data recorded on audio cassette during the interviews. Miles and Huberman (1994, p10) explain that the first step in analysing qualitative data is the process of data reduction which refers to abstracting and focusing the data that were collected. The transcribed data will be subjected to open coding where codes are literally made up as the researcher works through the data (Henning et al 2004, p105). During open coding where codes have been
assigned to different units of meaning, data will be analysed and put together to find meaningful patterns or trends and the related codes will be grouped, categorized and clustered (Henning et al, 2004, p.105). In this way, the experiences of the participants and data gathered from observations and document analysis will be used to generate an account of the educator’s perceptions of the use of ICT in their educational practice.

According to Hopkins (1994, p127) narratives are important in the development of social and personal identity because they identify with culture. To add perspective to this study, I will use narratives as a tool to portray the perceived role that high achievers on the IQMS evaluation see for ICT in teaching and learning. Lautenbach (2005) emphasises the importance of narratives and that they are useful for making sense of past experiences, and for sharing them with others. As already mentioned, traditional African stories are often used to teach morals and values to the younger generation. In this inquiry they will teach about the use of ICTs in education. The narratives, portrayed in a unique African context will add an extra dimension to the research by making the study uniquely African.

1.7 TRUSTWORTHINESS

It is very important to establish trustworthiness in a study. This is explained well by Lincoln and Guba (as cited in Krefting 1994, p214-222). They assert that trustworthiness is about convincing the audience of the fact that the findings of an inquiry are worth paying attention to or worth taking account of. They further argue that there are four strategies that could be combined to determine the trustworthiness of a study and these are: credibility, transferability, dependability and conformability (the four strategies will be further expanded in chapter 3 of this study).

1.7.1 Internal validity and credibility

Validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are (Golafshani 2003,
Validity is when the researcher recognises the need for accurate data and by being logical in interpreting the meaning. To validate data, I will ask the participants if they agree with the researchers collected data and check whether the findings make sense to them. Internal validity asks the question: How congruent are one’s findings with reality (Stake 1995, p108; Henning et al, 2004, p73; Merriam 2002, p25) and this will create a mutual meaning of the interpretations between the participants and the researcher. It will also reflect the real meaning of the concept under investigation.

External validity is concerned with the extent to which the findings of one study can be applied to another situation (Merriam 1998, p207). This study will provide enough description and information for readers to determine how closely it matches their situations, enabling them to decide whether findings can be applied to similar research work on ICT.

This research will further ensure external validity by providing the stories of the six participants. These stories will give a clear description of their perceptions on the role of computers in their teaching. The provision of a rich, thick, detailed data will ensure external validity. This means that the end product that includes demonstrations of how that interpretation was reached must enable others to trace the route that led the researcher to her or his final interpretation and findings which can be applied and transferred to other learning environments (Merriam in Creswell, 1994, p168; Robson, 2002, p171)

1.7.2 Reliability

White (2005, p200) explains reliability as the elimination of casual errors that can influence the results. Using multiple methods for collecting data will help with the eradication of errors, and the findings will constantly be compared with data collected so as to eliminate any mistakes. In order to eradicate these errors, I will go back to the participants for verification of data and also check if anything was not interpreted from their perspective. This will be done by asking them the same questions that they were asked originally. According to Key (1997, online) one of
the easiest ways to determine reliability is by the retest method in which the same tests is given to the same people after a period of time, then examine the consistency of the response between the tests. External reliability refers to the verification of the findings of the research (White, 2005, p201). White advises that the results must be consistent with data collected.

1.8 ETHICAL CONSIDERATIONS

Ethical measures are viewed as important in the research process. Participants cannot be viewed as objects. They are the subjects upon which the researcher relies upon to obtain information (Henning et al., 2004, p73). The ethical standards prescribed by the University of Johannesburg (UJ) will be followed throughout this study. Permission to conduct the research in different schools and districts will be obtained in writing from the Gauteng Department of Education. A letter of consent (Appendix A) will be provided to all participants to formally invite them to take part in the research and ask for their written consent. In this letter, a formal request will be made asking the participants to be part of the study and they will be made aware that their privacy will be protected. They will also be informed on what is going to happen with the information provided by them after the research has been completed. According to Cassel and Symon (2004, p56), a strict code of ethics and procedure for handling tape recordings and transcript material is essential to protect all parties. Another letter will be addressed to principals requesting access to the schools for observations (Appendix B) and they will be assured that the process will not interfere with scheduled teaching. The letter will be written in English but since it is not their first language, the details of the letter will be explained further verbally at the schools in a language that they best understand. Interviews will be conducted privately, preferably in one of the offices at the schools. The participants will be fully informed about the research process and its purpose, both verbally and through explanatory documents.

I will be responsible for maintaining ethical standards by ensuring anonymity of the participants, their right to privacy, and their right to decide on when, to whom and to what extent information can be revealed (White 2005, p210). Participants will
be made aware of their right to withdraw without penalty if they feel uncomfortable during the research process. Confidentiality will be guaranteed at all times and the information that they provide will only be released with their permission. Their right to anonymity will be granted and pseudonyms will be allocated accordingly to all participants when reporting the findings, to protect their identities and to guarantee that any information revealed, either personal or professional, will be regarded as absolutely confidential. Even though the outcomes of this research will benefit other teachers, I have to make sure that the study does not harm or create distress to the participants by allocating pseudonyms (Williams, 2003, p156).

The findings will first be made available to participants in order to give them a chance to comment. Objectivity and integrity will further be ensured in that all data collected for the study will be kept in a safe place for the duration of the study and will later be destroyed. All possible means will be undertaken to ensure that participation in this study is not detrimental to them.

1.9 SUMMARY

In this chapter, general orientation and rationale is provided. The main focus was on introducing the background of the study. The chapter further highlights the problem statement, research design, the multiple ease study, sampling, data collection strategies, analysis and interpretation of data. Chapter two will review literature on performance assessment and ICT competences.

1.10 THE OUTLINE OF CHAPTERS

Chapter 1: Provides a general introduction and a brief background to the inquiry. Aspects that are discussed in this chapter include; identification of the problem, the purpose of the study, the research design, data collection methods, data analysis, participants in the research, ethics and the definition of concepts.
Chapter 2: Provides research literature linking the IQMS performance standards with ICT competence.

Chapter 3: Outlines the research design and research methodology.

Chapter 4: Focuses on the presentation of collected data, and the discussion of the findings from this study.

Chapter 5: This is the last chapter of the research and the findings are summarised. Conclusions and recommendations for further study are also given.
CHAPTER 2

2.1 INTRODUCTION

The previous chapter has outlined the direction that this study will take. Chapter 2 is the presentation of literature that is relevant to this study. According to Gorman and Clayton (2005, p73), literature review can aid in focusing the topic and show what is known about the topic. The aim of the study is to find out how high achievers on IQMS perceive the role of computer technology in their teaching. Literature will assist by providing a foundation for the research and the information under study will be critically presented to provide an up to date understanding of the subject matter (Gray, 2004, p52).

The Integrated Quality Management System (IQMS) consist of three separate programmes that all focus on quality management. These programmes will be explored to shed light on how performance measurement takes place in the field of education and how they may impact on teaching and learning. High performers have the potential to improve teaching and learning through various innovations. For example, research carried out in Cape Town primary schools has confirmed improved grades in classes that were using ICT (Leach, Patel, Peters, Power, Ahmed & Makalima, 2004, p25). These schools also reported an increase in student motivation. To investigate any links between these factors I will provide a clearer description of teacher appraisal using the IQMS in this chapter. I will start by providing brief information on quality management, proceed to performance assessment, and then explore IQMS performance standards and ICT competences.

Total Quality Management (TQM) is a system which was in place before the IQMS. Hashmi (2004, online) explains that TQM is a management approach that originated in the 1950’s and steadily became popular since then. Both systems focus on Quality Management (QM) and both systems aim for continuous improvement as a supporting principle towards the growth of an organisation.
TQM maintains that organisations must strive to continuously improve and is now recognised as a generic management tool (Hashmi, 2004. online).

2.2 TOTAL QUALITY MANAGEMENT (TQM)

Total Quality Management (TQM) is a term that was widely used in the private sector. It was introduced to minimise mistakes and to increase the quality of work. According to Hashmi (2004, online) TQM involves both management and employees in the continuous improvement of products and services. It allows for continuous improvement in all fields of work and minimises mistakes. In education there is no room for mistakes and the curriculum should never be stagnant, but must always be improving for the benefit of the learner. Fitzgerald (2004, Online), documents the serious need for quality education and TQM being adopted in education. The aim of TQM in education was to focus on continuous improvement and accountability to help with educational reform (Fitzgerald, 2004, online). TQM can help a school to provide quality education to its primary customers who are pupils and educators. This shift towards higher quality standards in education provides for continuous growth and improvement and also offers more excitement and challenges to students and teachers while creating a climate for quality education. For this reason, many countries started introducing TQM in education.

A study conducted in the United States by Marshall, Prichard and Gunderson (2004, p55) revealed that from a sample of 18 districts implementing TQM, those that followed TQM policy were fully functional and were later classified as “healthy districts”. Those that didn’t were classified as “unhealthy districts”. Deming (in Marshall et al., 2004, p56) asserts that organisations can either improve or deteriorate but can never stay the same and that TQM ensures continuous improvement. It simply means that organisations with a solid quality management system that promotes continuous improvement of individuals will always show improvement. The successful implementation of TQM in the US proved that principles used in business can be successfully applied in schools and districts to ensure quality.
TQM ensures that every aspect of the institution is focused on achieving good results. Schools are judged according to performance of the learners and in order for a school to achieve good results, regular inspection and evaluations must be done by the School Management Team (SMT) to identify problems and remedies. The SMT must provide assurance by establishing systems and processes to meet specifications (Bush & West-Burnham 1994, p172). TQM includes many essential elements that the SMT can consider when planning for school improvement. These include awareness and commitment of all parties, a clear mission, a system of planning, a focus on mastery learning, and the provision of a warm and supportive environment (Fitzgerald, 2004, Online).

South Africa subsequently introduced its own concept of quality management in a system known as the IQMS. One cannot overlook the similarities that exist between IQMS and TQM because both programmes have the common goal of quality management. IQMS was implemented for the first time in 2004. While the IQMS aims to ensure quality by identifying specific needs of educators, schools and districts, TQM only suggests alternative ways to assess district and staff development practices (Marshal et al., p177; ELRC 2003 p3). Some more detail on the IQMS follows.

### 2.3 THE INTEGRATED QUALITY MANAGEMENT SYSTEM (IQMS)

According to the ELRC (2003, p3), the main objective of the implementation of IQMS is to ensure quality public education for all and to constantly improve the quality of teaching and learning. IQMS integrates different quality management systems that have different aims and are separate programmes in themselves (Office for Standards in Education, 2003, online) but all these programmes have a single goal of enhancing and monitoring performance of the education system. The IQMS consists of three programmes namely; Developmental Appraisal (DA), Performance Measurements (PM), and Whole School Evaluations (WSE). These programmes are aimed at enhancing and monitoring the performance of an individual educator and the school as a whole (ELRC 2003, p1). IQMS brings all
the systems dealing with development under one roof and is the relevant instrument that ensures professional development of educators and improvement of the school.

2.3.1 Developmental Appraisal (DA)

Appraisal is a formal management system that provides for the evaluation of the quality of individual performance in an organisation (Grote, 2002, p1). Developmental Appraisal (DA) is the process whereby educators are to be appraised in a transparent manner with a view to determining areas of strength and weakness and to draw up programmes for individual development (ELRC 2003, p3). Each educator must prepare for appraisal by choosing a group that will be responsible for tracking their development progress during the DA cycle and this group is known as the Developmental Support Group (DSG). The main function of the DSG is to mentor, provide support and prepare the educator for Performance Measurement (PM).

Each educator is expected to evaluate themselves using the same instrument that will be used for PM. Being familiar with this instrument helps the educator to become ready for evaluations and to know areas that need to be developed (ELRC, 2003, p6). The DA strengthens the results of the PM because if an educator gets good scores, he/she will get monetary incentives in the form of a one percent salary progression. Each educator is expected to be committed in their own development so that their performance can improve. During the DA cycle, each educator must have a comprehensive plan that will inform the educator’s activities during this period. The plan must for an example, have all the details about teacher development activities including timeframes and all minutes of meetings that were aimed at developing the educator.

An educator needs to be creative when designing a plan for the DA cycle. This plan records the educators’ improvement and activities that the educator was involved in. The plan can be articulately designed using a spreadsheet, with its cells, columns and its ability to do calculations. One of the greatest advantages of
using a spreadsheet programme is accessing a large number of functions to perform calculations. In addition one can compose a graphical representation of data (Kelly & O’ Connor, 2006, p211). The advantage of typing and saving the DA programme is that it can be regularly edited and upgraded.

To make the DA process manageable, a computer can ease the workload because documents can be saved for future use. According to Bialobrzeska and Cohen (2005, p16) some educators are starting to realise the benefits of a computer for administration purposes. Some teachers feel they have benefited from the use of computers because by enabling them to store things for later use and better presentation of work. Using a computer for administration purpose links directly with the role of a teacher as an administrator and manager (Bialobrzeska & Cohen 2005, p21; Shelly, Cashman & Vermaat, 2000, p8).

### 2.3.2 Performance Measurement (PM)

The main function of PM is to evaluate the individual teacher for salary progression, grade progression, affirmation of appointments, and incentives. When measuring performance, seven Performance Standards (PS) are used for a post level one educator and ten PS for post level two. The educator undertakes self evaluation assisted by the Development Support Group (DSG) and then draws up a Personal Growth Plan (PGP) before finalising the preparation plan for development (ELRC 2003, p.2). Then the educator, together with the DSG, identifies areas that need development and sets timeframes for the period of development. In this process I argue that the educator will have to make links that may be better supported by using technologies that are suited for the job.

The IQMS facilitates growth and development in the education field and can be positively linked with ICTs. In this section, I will now link the IQMS and ICTs by using performance standards (PS) 1 to 12.

**PS1** Making an effort in creating a positive learning environment that will benefit the learners (ELRC 2003, p24). The educator is expected to create a
positive learning environment that enables learners to participate actively and to achieve success in the learning process. The use of multimedia may create a positive environment that can accommodate students who learn more through visual activities, as well as those who are more verbally oriented (Carmen & Heifer, 2002, online) or learn in other diverse ways. Another important aspect of using ICTs for lesson planning is evaluation and feedback. According to a behaviourist perspective on computer assisted learning, the use of graphics and sounds grasp the learner’s attention and stimulates recall by enhancing retention and transfer (Forcier & Decsy 2002, p106; Picciano, 1994, p10). A constructivist approach may also help educators to provide learners with stimulating activities that will promote retention and learning.

**PS 2 Knowledge of curriculum and learning programmes is important (ELRC 2003, p26).** The educator must possess appropriate content knowledge, which may be demonstrated by the creation of meaningful learning experiences or activities. ICTs have the potential to broaden and deepen the content knowledge of these teachers. Using the Internet for these tasks is only one possibility. According to Alessi and Trollip (2001, p379) the World Wide Web (WWW) may be used to deliver learning materials including text materials but can also equip the educator with resources to make the lesson activities enjoyable and meaningful. Importantly, content to supplement traditional textbooks and other readings must not be the focus here. The focus should be on the learning activities. Access to all curriculum documents and learning programmes is also simplified using ICTs.

**PS3 Lesson planning preparation and presentation.** The educator demonstrates competence in planning presentations and management of learning programmes (ELRC 2003, p29). Evidence of essential records of planning and learner progress must be available. One advantage of using computers for lesson planning and creation of activities is that the work can be saved for future use.

**PS4 Learner assessments are recorded and the educator must maintain essential records which provide insight into individual learner progress**
(ELRC 2003, p.28). The educator must demonstrate competence in monitoring and assessing learner progress and achievement. Forcier and Descy (2002, p263) note that computer generated spreadsheets may be designed to keep statistics on each class activity. For example they may identify highest, lowest and average scores for an activity giving the teacher information by which to assess the activity. A spreadsheet can save time, allow the teachers to update information, and identify trends quickly and without the need for bulky assessment files.

PS5 Professional development in the field of work and participation in professional bodies. The educator’s engagement in professional development activities demonstrates their willingness to acquire new knowledge and additional skills (ELRC 2003, p33). Using computers to support a broad range of learning can be linked directly with the role of a teacher as a lifelong learner. ICTs can assist teachers to be on par with developments in theories of teaching and learning, new approaches in methodology, and latest developments in education policy (Bialobrzeska & Cohen 2002, p23). ICTs can also play a major role in professional development by training educators, developing materials, and accessing information to support teaching (Bialobrzeska & Cohen 2002, p104). This means that teachers remain on a path of continuing professional development through engagement with ICTs.

PS 6 Human relations and contribution to school development. The educator engages in appropriate interpersonal relationships with learners, parents and staff to contribute to the development of the school. Educators can develop human relations by sharing important information online through chat rooms and e-mailing one another important documents. According to Kelly and O’Connor (2006, p413) the Internet has various services like emails and chat rooms which provide opportunities for global communication. When such services are used properly, they can help with the improvement of human relations and have a positive impact on school development. Information distributed through ICTs can also be of great help to parents when assisting their children. School web sites, blogs, and other sources of social networking and sharing can all contribute to the development of a school culture and identity.
PS7 Extracurricular and co-curricular participation. The educator is expected to participate in extracurricular and co-curricular activities in such a way that it supplements the learning process and leads to the holistic development of the learners (ELRC 2003, p37). The opportunities for cross curricular integration when preparing and designing learning activities are endless with ICTs. When designing learning activities there is always the potential to incorporate many aspects that often fall within another learning area or subject discipline. Through collaboration between teachers using ICTs this aspect has the potential to make learning more collaborative, truly authentic, and enjoyable for all parties.

PS8 Administration of resources and records. The educator must administer resources and records in an effective and efficient manner to enable the smooth functioning of the institution (ELRC 2003, p39). Computers excel at managing data and make it easy for teachers to maintain accurate records and improve on classroom management. ICTs make it possible for teachers to maintain accurate student records, and track and analyse performance (Rusten 2002, Online).

PS9 Personnel management. The educator manages and develops personnel in such a way that the vision and mission of the institution are accomplished. When computers are used effectively and integrated into schools, they can strengthen teacher development, support broad educational reform and improve school management (Rusten, 2002, Online). Issues like race, ethnicity, budget constraints, geographical location and school size (Blaylock & Newman 2005, Online) can also be addressed more easily. All of these factors can lead to the formulation and presentation of a coherent and mutually constructed vision and mission for the school.

PS10 Decision making and accountability. The educator establishes procedures that enable democratic decisions that promote accountability within the institution. Computers excel at managing data and make it possible to
quickly retrieve and analyse information for decision making (Rusten 2002, Online). Technology also opens opportunities for new partnership within and outside the country (Chapman & Mahlick, 2006, p298). Technology opens new opportunities for international sharing of resources, materials, lesson plans and training materials. The use of ICT in education had given educators the opportunity to learn from many sources, including learning how other countries have made success of their education system.

PS11 Leadership, communication and servicing the governing body. The educator is expected to demonstrate well developed leadership qualities (ELRC, 2003, p46). A leader is expected to oversee and assist in the smooth running of the institution. According to Visscher, Wild & Fung (2001, p4) a computerised school information system can assist managers to have access to the data bank. Using the Internet offers various possibilities to assist in the running of school; for instance, the web based exchange of data between schools, external bodies and parents. Having a computerised information system helps the leadership to communicate with various stakeholders. Educators can always retrieve information and distribute it to other staff members which are demonstrative of a well organised school information system.

PS12 Strategic planning and financial planning. The educator displays competence in planning and development as entities in education management (ELRC, 2003 p50). The DoE has introduced School Administration and Management Systems (SAMS). Since 2006, schools have been trained on the effective use of SAMS and are expected to implement it. Countries like Hong Kong had been using SAMS for over a decade. SAMS offers support for School Management and the entire administration process. SAMS consists of 12 core applications such as School Management, Student Assessment, Staff Development, Planning Allocation and Financial Monitoring (Visscher et al., 2001, p42). Using computers for planning has benefited teachers working in schools that are not well resourced. According to Blaylock and Newman (2005, online ICTs provide a solution to inequalities in education because schools in rural areas get
the same information from the internet which was previously only available to well funded suburban population.

2.3.3 Whole School Evaluation (WSE)

WSE is informed by the results of DA and PM and is an interactive and transparent process to evaluate the holistic performance of the school, measured against criteria which are clearly stipulated by the Department of Education (DoE). The main aim of WSE is to give direction in improving the quality of education. (OFSTED, 2003, online). The purpose of WSE is to evaluate the overall effectiveness of a school as well the quality of teaching and learning (ELRC, 2003, p1).

The model for WSE is developmental. It eliminates the flaws that temper with good development of the institution. Assistance is provided to poorly performing schools after the evaluation, so that they can meet the standard stipulated in the WSE policy. WSE is also judgemental, since schools get rated after being evaluated. Those schools are expected to perform better so that they can get better scores.

For schools to perform better, they need good leaders who will make sure that communication lines are always open. Therefore school leadership is an important determinant of quality and encapsulate leadership management and communication which are crucial areas in the basic functionality of a school. The impetus to school effectiveness and improvement is through effective leadership that secures high quality provision and high standards and therefore effective management is a key to continuous improvement (Bush, 2003, p10).

According to ELRC (2003, p3), WSE focuses on nine areas for school evaluation, but I have discussed the following three areas as examples in order to highlight how ICTs can be used in WSE.
2.3.3.1 Basic functionality of the school

WSE focuses on the basic functioning of the school and day-to-day running of an institution. Everyone in the institution has an important role to play. Parents have a key role to play in supporting basic functionality of the school by managing, amongst other things, finances, raising funds, determining the language of instruction and recommending candidates for posts so that the school can function effectively. It is the duty of the administrators and educators to make sure that important information about the learners and parents is captured in a database (Picciano, 1994, p64) so that anyone who wants to access that information can do that with ease.

Computers also play a very important role in the functionality of the institution. Chapman and Mahlck (2006, p92) emphasise that computers can be used to deliver learning activities, for record keeping and reporting, and to compile and analyse data. This simply means that computers help with the smooth functioning of the school and can be used for day to day activities.

2.3.3.2 Curriculum provision and resources

WSE stresses the need for proper planning which involves all stakeholders. Constant communication is important at schools and contextual factors must be considered when planning. Since the curriculum requires contextual factors to be considered when planning, using e-mail saves time and money when communicating with everyone involved, especially parents. The use of ICT plays an important role during whole school planning. Advances in ICT have dramatically changed the learning and teaching process, and have expanded on new learning opportunities and simplified access to educational resources beyond the old traditional ways of teaching (Coley & Angel. 1997; Wozney, Venkatesh, & Abrami, 2006, p173). Chapman and Mahlck (2006, p27) assert that the use of technology also provides greater consistency and quality in education.
2.3.3.3 Learner achievement

Countries like America use learner achievement to assess educator competence, even though the appropriateness of using learner achievement to assess educator competence is hotly debated (Rusten, 2002, online). There is growing consensus to hold schools responsible for what and how learners learn. Using learner achievement as a measure of educator competence rests on the assumption that an important function of teaching is to enhance learning. By producing good results whereby learners became competent in what they have been taught and attach meaning to it, education contributes largely to building a strong winning nation because of its vital role in preparing learners to be highly skilled human beings who will one day assume their important role in the community (Motshega, online).

Programmes like IQMS can also focus on the use of technological developments by teachers. Assessments can ascertain whether ICT is being used effectively to benefit learners. According to Picciano (1994, p160), both intrinsic and extrinsic rewards need to be considered for staff who became involved with developing and implementing technology in their schools.

2.3.4 WHOLE SCHOOL DEVELOPMENT

Whole school development is aimed at transforming the institution holistically with a view of making it more functional. All aspects of school life such as leadership, school culture, parental involvement, discipline, curriculum and management are important in the daily activities of the school. If whole school development has been well planned and implemented properly it has the potential to benefit both learners and teachers. Change within an institution can result in good learner performance and create a better future for them and the society in which they must function. Staff can be used in this process. Deming (In Marshall, Herman & Watters, 2004, p178) emphasise the continuous training of all staff. Whole school development includes other stakeholders namely; parents, educators, learners and the provincial department of education who must work together and accept responsibility to ensure that a culture of teaching and learning is fostered in every
institution. Not only must the school and education authorities work together, but parents as primary educators and non-educator members of staff must all accept and share the responsibility for governance of the school. According to Kaufman, Herman, and Watters (1996, p12), proper planning for whole school development requires people to get out of their comfort zones and enlarge their paradigms.

Whole school development requires active participation of all stakeholders who have a vested interest in the school. This implies creating the necessary climate, structures, and support mechanisms for genuine participation and involvement. This is essential if parents are to be involved in raising the quality of education. Whole school development is also considered to be a more effective means of improving standards for teaching and creating effective schools as it is more inclusive and seeks to meet the collective needs and aspirations of the broader community (Squelch 1998, p103).

Teachers are key players in whole school development, but for teachers to be competent they need to be developed from time to time so that they are in line with the changing curriculum. Teacher development has been a major focus in the country’s education system. According to Motshekga (2006, online) teacher development is the single most important lever for quality improvement across the system. She promised that the department will provide educators with the opportunity to realise their growth needs through the IQMS. The introduction of IQMS in education therefore aimed to improve the quality of teaching by motivating teachers to perform better.

2.3.5 TEACHER DEVELOPMENT

Teachers need to review and expand their knowledge in order to produce quality and improve the overall running of the school. An important ingredient for implementing change, improvements and innovations in education is a knowledgeable and vibrant staff (Picciano 1994, p161). Continuous improvement of quality delivery (Trethowan, 1991, p29) is possible if it is done with the teachers, not to them. Involving teachers in their own development yields positive results.
Educators who end up improving their academic status can then be used to uplift other educators. According to Morrison et al. (1999, p348) once teachers learn how to use ICTs for classroom management, they find that they have more time to spend on their teaching duties. Figure 2.1 shows how staff development can be structured in an institution. It cannot be used in isolation but has to be integrated into the whole school system.

**Figure 2.1: Staff development planning (Picciano, 1994, p154)**

A huge drawback to staff development is their lack of ICT skills. At times the attitude of certain individuals towards ICTs can also be a limiting factor. One cannot avoid discussing the lack of skills when discussing technology usage in schools as many teachers are uncomfortable with ICTs and lack confidence in using these tools (Picciano 1994, p153). These teachers are threatened by technology and can possibly be encouraged by other educators who are experienced in the use of ICTs. Picciano further recommends that there should be ample support and time, not only for teachers to learn how to use technology but also to plan carefully for its use in classroom. This may even require fundamental changes in the way teachers teach.

Integrating technology in teaching and learning requires proper planning. Staff development needs planning that could include the following:

- Staff development - planning activities that integrate staff developments with other planning activities.
- Access needs – identifies the staff development needs of a district.
• Design a program that meets the needs.
• Provide incentives for staff to participate.
• Implement program.
• Evaluate and review hands on activities (Picciano 1994, p154):

It is important to consider the above points when planning to implement technology in schools but providing incentives as a form of extrinsic motivation may be another strategy. IQMS recommends the importance of motivating teachers by giving them incentives in the form of 1% in salary increment. Taking these factors into consideration may help with a successful implementation of technology in schools. All role players should feel that they play an important role in school, rather than feeling left out. Figure 2.3 shows how staff development activities can be conducted in order to meet the needs of the majority of the staff.

![Figure 2.2: Elements of a staff development Program (Picciano, 1999, p157)](image)

2.3.6 THE role of Information and Communication TECHNOLOGIES IN teaching

Wozney et al (2006 p173) state that computers can play an integral part in the classroom and that ICT is the vehicle that will bring change to the education system and will result in quality teaching. This has proven to be the case where the introduction of the IQMS has encouraged some educators to register at higher education institutions to explore ICT in their teaching. A number of studies
demonstrate ICTs potential to transform both teaching and learning. One such example is the Apple Classroom of Tomorrow (ACOT) research program where researchers found that students were able to communicate effectively about complex processes, mastered content quickly, and shared their understanding confidently (Rusten, 2002, Online). Computers also offer technical and research skills for both students and educators. ICTs are known for their ability to help students graduate from high school (Kelly & O’Connor 2006, p5) with the foundation skills that will enable them to participate in a technology rich society and became lifelong learners.

All educators are expected to prepare lessons to exhibit solid content knowledge. An educator must then present the lesson in a manner that will create a meaningful learning experience (Chapman & Mahlck, 2006, p28). ICTs must add value to the process. ICTs can add interactivity to the process and promote collaboration. Collaborative learning, can motivate learners to participate in activities that encourage life-long learning. Learners and educators will not be bound to textbooks but can use the internet for different purpose. Learners can engage with ICTs in interactive educational games which are designed to help them learn deductive as they solve entertaining problems. The teacher is able to create positive learning environment that can enable learners to interact with others across time zones, languages and cultures allowing them to develop a better understanding of the outside world. The Internet can be used to expose learners to the outside world, thus serving as a democratizing tool for information and communication exchange. It also opens up a new world to learners. ICTs offer more than just faster access to more information, they provide an opportunity to fundamentally change the way children learn (Chapman & Mahlck 2006, p31).

Educators are expected to keep a track record about learner progress and this information is usually kept in educator’s personal files. It is impossible to have accurate records and results of all learners in a class available at all times because of workload. Computers can play a major role in record keeping and assessment. A database involves the management of complex data that can be updated from time to time. Spreadsheets can be integrated with databases
because both are important tools in the presentation and manipulation of data (Picciano 1994, p66-73). The major benefit of a spreadsheet is that mathematical operations can be performed automatically and the spreadsheet can also be used to analyse test scores and create a variety of statistics.

Computers have proven to be successful in teaching and learning and can be used for planning too. Planning involves developing strategies in an organisation for the future and also considers the social needs of students, administrators, teachers and community within the context of a school (Picciano 1994, p40). Planning requires infrastructural “backbone” and involves all relevant stakeholders from a range of different sectors (SAIDE, 2000 online). This means involving everyone with the best interest of the institution at heart. Involving the community in planning helps develop a culture of lifelong learning and creates a close relationship between the community and the school. ICT can provide the required resources that will make the planning process easy and manageable. According to Forcier (2002, p420), the use of computers in planning involves:

- Applying productive tools in creating multimedia presentations.
- Use of computers to support problem solving, data collection, information management, communication and presentations.
- Demonstrating awareness of resources for adaptive assistive devices for students with special needs.

Another advantage of planning with computers is that teachers are not expected to start all over again every time they are planning. With the help of a good backup system, they can always add new information, and update previous documents. Picciano (1994, p46) suggests involving administrators to distribute resources equitably among participants to help to make planning more manageable. A school without a good administration system will from time to time plunge into serious crisis, as evidenced with the introduction of the South African Management Systems (SAMMS).
The Gauteng district demands that SAMMS be used for school administration resulting in teachers and administrators regularly attending workshops on the use of the product. The main challenge is that most teachers are not computer literate. However, when SAMMS is used, it helps with many administrative functions of the school. It helps, for example, with communication with parents, generation of learner reports, timetabling, and managing learner assessment. According to Morrison, Lowther and De Meulle (1999, p341) it is important to evaluate software. Software must be accurate, easy to use, be technically reliable, precise and give consistent directions. SAMMS complies with most of these requirements and if used properly can ease the workload of both administrators and educators. This is only one of the initiatives by the DoE aimed at improving school administration.

Policy also requires schools to do school planning every three years. A needs analysis and contextual factors are included in that planning. This type of planning is known as strategic planning and is a forward looking, proactive option that seeks to create a better future by encouraging education partners to join hands in defining and achieving important results and contributions (Kaufman, Herman & Watters 1996, p4). If planning is done correctly, it can truly benefit the school by defining educational interventions, including curriculum and learning experiences (Kaufman et al, 1996, p6) and can include planning for ICTs in the future.

2.3.7 THE CONSTRUCTIVIST PERSPECTIVE IN TEACHING AND LEARNING

Constructivist theory argues that humans generate knowledge and meaning from their experiences (Atherton 2010, online). This theory can help to explain developments and concepts of learning in relation to the many changes in the education system that have already been mentioned in this chapter. In behaviourist terms, learning can be described as changes in the observable behaviour of a learner made as a function of events in the environment (Skinner, 1978 in Alessi & Trollip, 2001, p16). Constructivists, on the other hand, view humans as active agents in their own development. This simply means that humans are active in shaping their own development. Therefore knowledge is not passively received, but is actively constructed and not simply taken in by people.
Piaget articulated mechanisms by which knowledge is internalised by learners. He asserted that individuals construct new knowledge from their experiences (Atherton 2010, online). Forrester and Jantzie (2003, online) confirm that all human beings have the ability to construct knowledge in their own minds through a process of discovery, learning and problem solving. Learners are actively involved in progressively building more complex understanding of their world by being active creators of knowledge and learn by observing, manipulating and interpreting the world around them.

This theory holds that the only reality that matters is that of our individual interpretation of what we perceive. Knowledge is not received from outside and is not transferable. The participants in this inquiry also need to go out, seek information about ICTs in education, and make meaning out of it in order to add value to their teaching and learning. They must actively construct new knowledge based on their individual experiences and understanding (Forcier & Descy 2002, p421. This active construction of knowledge also works better through collaboration.

I contend that teachers perform better when working with others in trying to make meaning of their world. Through solving problems together they begin to make meaning of their activities. This opinion is strongly based on Vygotskys’ belief that people do not live in a vacuum but exist in a social context (Vygotsky, 1978, p56; Atherton 2010, online). Constructivist teachers who are better equipped with ICT skills may view collaborative learning as beneficial because it exposes them on many levels to the outside world. The Internet is only one example of a tool that can fulfil this role.

The need for quality education, and the introduction of ICTs in education, has led to many changes in the education system, including the introduction of new subjects at school level, like Computer Applications Technology (CAT) and Information Technology (IT). ICTs are becoming much more of a focus at these schools for both learners and teachers. Alessi and Trollip (2001, p17) maintain that constructivism sees learners as active creators of knowledge, who learn by
observing, manipulating and interpreting the world around them. The ICT tools that are now available to them also help them to construct their own view of reality. Similarly, teachers who believe in constructivist principles can use the constructivist approach to allow students to discover for themselves (Forcier, 1999, p112).

Constructivist teachers may favour software that is designed to pose authentic problems. They may construct scenarios to make students more active in their own learning (Forcier, 1999, p112). This kind of exercise may encourage learners to be active participants in their own learning and the teacher can become the facilitator. This allows more time for the teacher to recognise the strengths and weaknesses of learners while facilitating their learning. Teachers who are afforded more time for facilitation, through getting away from the instructivist mode of teaching, will naturally be able to focus their attention on other issues such as differences in intelligence and learning styles, learners with special needs, and learner motivation. According to Forcier (1999, p113), good teachers understand how a computer can inspire motivation in learners and also help teachers make intelligent and informed decisions about their learners. This is supported by Chapman and Mahlick (2004, p35) who emphasise the motivational aspects of using ICTs to make learning more interesting.

Through the use of authentic tasks and activities (Reeves, Herrington & Oliver 2002, online) that are personally relevant to learners, teachers who use ICTs in the teaching and learning process may encourage learners to construct their own knowledge and in return, keep them motivated. ICTs used by teachers for teaching and learning can also encourage learners take ownership of the learning activities and their own personal learning. Constructivist teachers also emphasise on collaborative learning in environments, whereby learners can work on a shared project or goal, such as a group of learners working on a newspaper or building a car engine (Alessi & Trollip 1999, p34). These learning environments improve the social skills of learners and encourage working independently as they are able to get information from other learners.
2.3 SUMMARY

In this chapter Quality Management (QM) was explained and a brief history on Total Quality Management (TQM) was given to explain the appraisal system that is currently in use within the Gauteng provincial schools. This was followed by a brief description of ICTs in education and how a constructivist approach could be used to promote the use of educational technologies in schools.
CHAPTER 3

3.1 INTRODUCTION

In this chapter, I elaborate on the appropriate instruments and techniques to collect and analyse data in this study. I will further explain the research approach. It is important to consider the purpose of the research, which is to establish: How do high achievers on the IQMS perceive the role of computer technology in their teaching. Gorman and Clayton (1998, p74) state that if others have succeeded in using certain designs and methodologies to investigate similar problems, those can confirm what one intends to do. I will be guided by qualitative principles in investigating the research problem and be informed by those who are experienced in the field.

This chapter begins with the research design, then explains the qualitative approach and thereafter focuses on the techniques that were used to select participants. Specific cases are then discussed, followed by data analysis techniques. The credibility of the research is established by making sure that the information is valid and reliable.

3.2 RESEARCH DESIGN

Henning et al (2004, p32) describe a research design as the detailed plan of how research is conducted. According to Welman and Kruger (1999, p46), research design is the plan according to which we obtain research participants and collect information from them. Mouton (2001, p74) explains that a research design is a plan or blueprint of how one intends conducting the research. He further elaborates that a research design focuses on the end product (research findings), formulates a research problem and then focus on the logic of a research. This includes the aim of the research which is to establish how high achievers on the IQMS perceive the role of computer technology in their teaching.
The design of this study is a multiple case study. I chose a multiple case study because case studies usually provide a thick description of the phenomenon, which gives readers a sense of meaning and intentions inherent in that situation (Gall, Gall & Borg 1999, p290). This design will help to introduce the six educators who are the focus of this study to the reader and will provide answers on how they interact with their ICT environment in their teaching and learning. Choosing a multiple case study will, therefore, help me to understand the story behind each participant as they engage with ICTs in their work.

The research design chosen in this study will also help me to elicit stories from teachers who achieved high IQMS scores and in the process I will learn how they perceive the role of ICT in their teaching.

3.3 QUALITATIVE RESEARCH AS A METHODOLOGY

In this study a qualitative research methodology is used. Qualitative research allows me as researcher to be the primary instrument for data collection. As a researcher I need to be careful not to influence the findings. To ensure this I must first acknowledge my role as researcher who can tell stories from the participants view rather than trying to be an ‘expert’ who passes judgments on participants (Creswell 1998, p18). In order to do this, an exploratory and descriptive approach will be used in this inquiry.

Qualitative research involves an interpretive, naturalistic approach to the world. This implies that qualitative researchers study things in their natural setting attempting to make sense of the meaning people bring to them (Denzin & Lincoln 2003, p5). White (2003, p11) emphasises that the major distinguishing characteristic of qualitative research is that the researcher attempts to understand people in terms of their own definition of the world. By visiting teachers at their own schools, within their own natural setting, I will try to understand the social and cultural context in which they live (teachers using ICTs in their teaching). Creswell (1998, p17) emphasises that researchers must go to the setting of the study.
because if participants are removed from their setting, it may lead to contrived findings that are out of context. Interacting with participants with high IQMS scores by going to their schools will help in giving a clear perspective about their perceptions on ICT in their teaching.

Another reason for using the qualitative approach is that qualitative studies can be used successfully in the description of groups. Denzin and Lincoln (2000, p8) stress the socially constructed nature of reality. I find this appropriate since the design of this study is a multiple case study, and even though the six participants are independent cases, the stories will all contribute to the collective story of using ICTs in teaching.

Qualitative research insures that social reality is constructed from the analysis of the data. Being part of this setting will help me to interpret reports that reflect my own constructions of the data and allow readers to form their own opinions from what is reported (Gall et al, 1999, p150). For this reason, the narratives created in this study must be rich in details and insights into participants’ experiences of their environment.

3.4 DESCRIPTION OF MULTIPLE CASES

Creswell (1998, p36) describes a case study as being characterised by a problem, context, issue(s) and some lessons to be learnt. It is also bound by time, place and also by description of context. This study has been guided by Creswell’s description of a case study. When multiple cases are chosen, a typical format is to first provide a detailed description of each case and theme(s) associated with the case (Creswell 1998, p63). I will give a brief description of each case to help the reader understand the six participants well.

Educator 1 (let’s call him “Tumi”) teaches Economics and Management Science (EMS) at a primary school. He has a Further Diploma in Computer Literacy. He registered for a BEd (Hons) in Computer-based Education and completed this in 2006. With the knowledge he gained from his studies, he was subsequently able
to try out new ways of teaching with technology. He found the lack of ICTs in his school to be very limiting and the six donated computers were not adequate for his needs. Six computers for teaching and learning soon expanded when another fifteen old computers were made available to the school through a donation. Unfortunately these computers were not in a good condition and there were no funds to upgrade or even maintain them. His frustration soon led Tumi to apply for posts at schools where ICTs were more freely available. His need to apply his skills and knowledge about ICTs in education was the main driving force in this process.

Educator 2 (let’s call her “Girly”) teaches in the foundation phase. She completed her BEd (Hons) in Computer Based Education in 2006. She is involved in many school activities and serves on a number of committees at the school. She feels that educators expect too much from her even though she understands that most of them are not computer literate. One committee where she feels that she has made a vast difference is the school awards committee where she was solely responsible for planning events and designing the certificates without the help of other committee members. She prides herself with her good files and most teachers rely on her for assistance with their own filing and administration. The school does not have a computer for her to use so she usually brings her own personal laptop to school. The few computers at the school are mainly used by administrators and the school management team so she has found a way to empower herself and refuse to be left behind in this technological age.

Educator 3 (let’s call him “Thato”) is a Head of Department (HOD) in a secondary school and teaches Mathematics and Computer Application Technology (CAT). He has a university degree and has used ICTs in his studies. He wants to upgrade himself and do a BEd Honours at the university. He is assisted by another educator at the school who is a recent Computer-based Education (CBE) graduate from a nearby university. This support is important to him especially with regard to CAT which is a relatively new subject in the school curriculum. Thato has brought in many initiatives with the aim to see more educators being computer literate. He believes that computer literacy will lead them to being better subject teachers.
Unfortunately he does not get enough time to implement his well intended plans and subsequently only manages help a handful of educators at a time. Focusing on his teaching, Thato has forty computers and a server at his disposal and this has allowed him as a CAT educator to make sure that each learner has access to a computer at regular intervals. Through his endeavours, all of the computers are connected to the Internet and there is also access to other multimedia technologies including two DVD players and a television.

Educator 4 (let’s call her Sisi) and Educator 5 (let’s call him Neo) both teach at the same secondary school. Neo is more experienced in teaching CAT and was the one who initiated CAT as an examinable subject at the school. He took the necessary steps to make sure that it was registered with the DoE. He is an acting Head of Department for CAT and Information Technology and teaches Mathematics and CAT. He has a diploma in computer literacy and in 2004 obtained a BEd honours degree in Computer-based Education (CBE). Seeing the growth of learners who wanted to study computer related subjects, he approached Sisi for assistance and found that she was registered for her first year BEd (Honours) in CBE at the university. Sisi is also very passionate about ICTs. This passion originated from her previous teaching post where she was never given a chance to use the technologies. Her frustration led her to take up her present post. Neo then assumed a mentoring role for Sisi and made time available to assist her whenever possible. Sisi teaches CAT and Life Orientation at the school. She sometimes uses other educators as assistants during the teaching and learning in the computer-related subjects. Their school has forty computers which were donated by the Telkom foundation and a second laboratory provided by Gauteng on Line with twenty five networked computers. All computers are connected to the Internet. DVD players, two televisions, and an over head projector are also at their disposal for teaching and learning.

Educator 6 (let’s call him Ben) teaches at a commercial College and is a HOD for Mathematics, CAT and Science. He also teaches all these subjects. He has a degree and studied short courses in Information Technology. He has initiated and is still involved in many teacher development projects at the school. The slow
transition to using ICTs for teaching and learning in his school is discouraging him to a point where he admits to wanting to quit teaching.

3.5 SAMPLING

Sampling is defined as a process whereby the researcher makes a selection from the sampling frame in order to identify people or issues to be included in the research (White 2003, p114). According to McMillan and Schumacher (1989, p161), the sample consists of individuals selected from a large group of persons called the population. Researchers rely on their experiences, ingenuity or previous research findings to deliberately obtain units of analysis in such a manner that the sample they obtain may be regarded as representative of the relevant population (Welman & Kruger 2001, p63). Purposive sampling was used in this study because it focuses on selecting cases whose experiences will illuminate the question under investigation. Sampling is used to ensure that the results gained are representative of the cases chosen (Yates 2004, p25). After developing the research question, I had to identify the sources of the phenomenon being studied and the individuals who are willing to share their experiences and include them in the research sample.

Qualitative researchers often work with small samples of people or phenomena in a particular context (Gray 2004, p32). The specific population that I have carefully selected for this study are six educators from four different schools. These are the educators who have achieved high scores in IQMS. Welman and Kruger (2001 p46) define population as objects of study, which may be individuals, groups, organisations, human products and events or the conditions to which they are exposed. The six educators had two things in common namely; they had achieved high scores during the IQMS process in 2005, 2006 and 2007 and secondly, the educators are all computer literate and use their knowledge of computers in teaching. It is important for this study that I talk to people face to face and also study their situation first hand.
The population consist of both female and male respondents who have different work experiences and teach different subjects. They are from two districts namely; Johannesburg West (D12) and Johannesburg South (D11). A further criteria used, is the purposive selection of the individuals because they all have access to computers. According to Patton (2002, p243) purposeful sampling select information rich cases strategically and purposefully, meaning the number of cases selected in this study depends on study purpose and what the study wants to achieve. These information rich cases involve the six participants who are all high achievers in IQMS.

3.6 METHODS OF DATA COLLECTION

**Individual interviews** and informal **observations** and **document analysis** are used in this study as methods of collecting data. Patton (2002, p248) emphasizes the advantage of using multiple methods for data collection known as triangulation in which different types of data provide cross–data validity checks. The triangulation of methods strengthens this study by combining interviews, observations and document analysis. I will attempt to gather information through the use of a variety of sources to increase the reliability of the data (Patton 2002, p247; White 2005, p89).

3.6.1 Documents

Stake (1995, p25) states that documents serve as substitutes for records of activity that the researcher cannot observe. Documents used during IQMS (performance measurements) are forms that are used when the teacher is evaluated. Educators’ strengths and weaknesses are easily identified from these forms. The strength of these documents as a data source lies in the fact that they already exist in the situation, they do not intrude upon or alter the setting in ways that the presence of the investigator might (Merriam 2002, p13). These documents will be used purely to aid in selection of high achievers on the IQMS.
3.6.2 The Qualitative Interview

According to White (2005, p14), an interview provides access to what is inside a person’s head and makes it possible to measure what a person thinks. Salkind (1997, p214) also explains that one can note an interviewee’s non-verbal behaviour, the setting and other information that might prove valuable for the study. Open ended interviews with individual participants will be conducted so that each participant can freely participate without feeling intimidated by the responses of other participants. Open-ended interviews require careful wording of each question before the interview (Patton 2005, p344). Since the six participants will be interviewed separately, all questions will be asked using similar wording for each interviewee. During the interview process, I will create a positive environment for the participants so that they will feel free to share their experiences on how they utilise ICT in their teaching.

In depth interviews conducted in this study are specifically aimed at understanding the participants’ involvement in ICT and the impact of that in achieving high IQMS scores. Thereafter various life stories will be elicited from the interviews when analysing the data. In the interviews conducted, it is my task as an interviewer to invite participants to tell their stories. Getting participants to tell their stories and not merely provide reports (Riesman 2002, Online), lies in the questions we ask and the orientation embedded in these questions. This is done by asking questions that direct participants to their own life experiences and not to my own research interest. This lies in the orientation of the question and not the wording.

Narrative is now recognised as one of the most basic ways that people use to represent their understanding of the world by making sense of past experiences and sharing these with others. The narrative way of transcribing the findings from the interviews fits into this study and integrates well with the other forms of qualitative data collection techniques already mentioned (Riessman 2002, p706). Therefore a narrative can be seen as a potentially useful research tool to complement the use of multiple case study and data collection strategies.
Narratives will add an extra dimension to interviews because they are significant incidents in the participants' lives.

Data from these open ended interviews with individual participants who were purposefully sampled according to their degree of engagement with ICT will be analysed and the findings represented in a narrative format. Their stories will then be presented African folklore style. These stories will inform readers on how these high achievers on the IQMS see the role of ICTs in their teaching and learning. These interviews will capture the experiences of the six participants. According to Lautenbach (2005) the aim of conducting such interviews is to identify the narrative qualities in the collected data rather than just collect stories from participants.

### 3.6.3 Observations

Observations as stated by Patton (2002, p263) have many advantages in that the inquirer is better able to understand and capture the context within which people interact. I will observe the everyday activities and this observation will comprise all formal and informal interactions with the participants’ day to day activities. Furthermore, being the participant observer one can discover things no one else has ever really paid attention to. Observations provide a first and encounter with the phenomenon during which field notes will be taken. The participants will be observed during the normal teaching day as they go about their practice as educators. Observing the participants will assist in finding out what was missed during the interviews or to highlight certain aspects that were unclear. Henning, van Rensburg & Smit (2004, p82) advise that it is wise for the researcher to keep in mind the importance of meticulous crafting and recording of the observed site. An observation schedule will be used for this purpose.

### 3.7 DATA ANALYSIS

Since the interviews are not narrative interviews but ordinary qualitative interviews, I find it necessary to follow the qualitative data analysis approach. Qualitative data
require a processing stage often involving editing of notes and transcribing of tape recordings. After data collection I will transcribe interviews into MSWord documents and verify the data collected during the observations with each educator. I will go back to each educator and verify data as some of educators expressed discomfort about observations and interviews. I will also use this opportunity to collect all documents used when delivering lessons.

According to Miles and Huberman (1994, p10) the first step in analysing qualitative data is the process of data reduction, which refers to abstracting and focusing the data collected. An important first step is to codify notes that are taken in the field. This is done so that I can gain understanding of the processes that are under investigation. I will establish patterns and look for similarities in the transcribed data. This data will be placed in a table format showing relations between different categories. Codes will be literally made up as I work through the data. This process is known as open coding, where codes are assigned to different units of meaning. Data are analysed and put together to find meaningful patterns or trends. Gray (2004, p319) asserts that qualitative analysis is a rigorous and logical process of disaggregating the data into smaller parts. This is part of the process where the sheer volume of data is reduced and made not only more manageable but more coherent (Gray 2004, p321). In this multiple case study the emerging themes will be used to create a number of narratives. According to Creswell (1998, p154) this is a typical example of the process of pulling data apart and putting them back together in a more meaningful way.

In this study themes from the 6 individual interviews will be used to compose the narrative portraits of the participants during their engagements with ICT tools during performance assessment. Lautenbach (2005) supports the use of narrative analysis because it strengthens the study. Narratives can be used as means of making sense of past experiences and sharing it with others. Clandinin and Connelly (2000, p18) maintain that narrative is the best way of representing and understanding experience. The experiences of the six participants will be told in a story format that I have already mentioned in chapter 1. These stories draw on the style of traditional tribal storytellers who are also known as the guardians of the
Umlando or “tribal history” (Hlatswayo, 2010). These stories will only roughly conform to the actual traditional storyline as passed down through the ages and will be told in English (where some of the finer nuances of the narrative may be lost in translation). By using the rough storyline from these tribal accounts I will attempt to portray the integration of ICTs into teaching and learning in a manner that may appeal to a broader spectrum of readers.

In order for me to capture these stories within the unique South African context, I have to enter the participants’ environment while they are engaged with their daily activities. “I will then find myself in the midst of living and telling, reliving and retelling the stories that make up (these) peoples’ lives” (Clandinin & Connelly, 2000, p20). In this analytical approach the stories and narrations can be categorised through the use of cultural traditions and myths (Bruner 1987; Polkinghorne, 1988, in Richmond 2002, p3). So in this study, traditional storylines will be used to add plot and coherence to the narratives. By composing a number of narratives in this way, I will attempt to accurately portray the tellers’ perspective on themes or processes relating to how they use ICTs for teaching and learning. Murray (1997, p9-20) refers to this as “life construction” where the story may not represent the “truth” or reality but is an attempt whereby the variety of life events is reduced to a set of narratives.

On completion of the narratives, the participants’ experiences will be outlined in story maps, simply to create a multiple case comparison. According to Garraway (1996, in Richmond 2002, p2) such comparison may create evidence of the usefulness and trustworthiness of the methodology. This analysis will provide me with a framework as I try to make sense of the participants’ world through stories (Lautenbach, 2005).

3.8 TRUSTWORTHINESS OF THE RESEARCH

Qualitative researchers should ensure that data is collected in a valid and reliable manner (Tashakkori & Teddlie 1998, p75). Krefting explains that Truth-value is determined by whether the researcher has established confidence in the truth of
the findings. The qualitative researcher always pays attention to the quality of information and it is very important to establish trustworthiness in a study. This is explained well in Lincoln and Guba (as cited in Krefting, 1994: p214). They assert that trustworthiness is about convincing the audience of the fact that the findings of an inquiry are worth paying attention to or worth taking account of. They further argue that there are four strategies that could be combined to determine the trustworthiness of a study i.e.: credibility, transferability, dependability and conformability.

According to Stake (1995, p107) it is the duty of a qualitative researcher to ask during or after a study “Did we get it right”. In this qualitative research I use a variety of procedures to establish trustworthiness. I concentrate on standards of quality and the text of this dissertation displays honesty or authenticity about my stance as author (Creswell 1998, p196).

### 3.8.1 VALIDITY

In this inquiry I recognise the need for accurate data and attempt to be logical in all interpretations that I make. To validate data I will ask participants if they agree with my findings and will check whether my findings make sense to them. This study will also ensure external validity through the provision of rich, thick, detailed descriptions so that anyone interested in transferability will have a solid framework for comparison (Merriam, 1998 in Creswell, 1994, p168). This study will provide enough description and information for readers to determine for themselves whether findings can be applied to other situations related to ICT in education but I do not claim that the findings are generalisable to all contexts.

### 3.8.2 Internal Validity and credibility

Credibility is the most important component in establishing the trustworthiness of the findings and inferences from qualitative research (Tashakkori & Teddlie, 1998 p90). To enhance the credibility of this study I will, from time to time, go back to the participants to verify information with them in order to check the correctness of
my understanding. This contact with participants will minimise the distance between me as researcher and the participants (Creswell 1994, p58). Participants will confirm accuracy of my interpretations.

Triangulation of methods will play an important role in ensuring credibility of the results (Creswell 1994, p 158). The use of interviews and observations to gather information enhance the accuracy and credibility of results in this study. According to Robson (2002, p174) triangulation is a valuable and widely used strategy to enhance the rigour of the research.

### 3.8.3 External Validity and Transferability

Transferability refers to the level to which other researchers can apply the findings to other context or replicate the research by using other participants (Babbie & Mouton 201, p277). Transferability or external validity is used to determine whether the results of a study can be generalised to other contexts. In this research, I am not looking for results that can be generalised but rather try to provide narratives that may help to give meaning to other stories of engagement with ICTs no matter what the context may be. The replication of method in this study is definitely possible, but results and stories that arise from other contexts will surely differ.

### 3.8.4 Internal validity/ Objectivity and Confirmability

Internal validity asks the question: How congruent are one’s findings with reality (Stake, 1995, p.108; Henning et al 2004, p73; Merriam 2002, p.25). In this research I attempt a mutual meaning-making of the interpretations between the participants and myself. How the participants construct reality and how they understand the world must be reflected in the narratives produced in this inquiry. Merriam asserts that when reality is viewed in this manner, internal validity is a definite strength of qualitative research.
3.8.5 Reliability/ dependability

White (2005, p200) explains reliability as the elimination of casual errors that can influence the results. External reliability refers to the verification of the findings of the research (White 2005, p201). A thick description of data will follow the individual narratives in order to show exactly how excerpts from the interviews are used in the construction of the stories.

3.9 SUMMARY

In this chapter the research design and methodology are outlined and recording of raw data. Selecting and using appropriate instruments, data sources, sampling methods and multiple measures helped to ensure that high quality data was collected for evaluation. The next chapter will provide the presentation of the collected raw data and the discussion of the research findings.
CHAPTER 4

4.1 INTRODUCTION

The purpose of this chapter is to present findings derived from the data and to add my interpretations of findings. This chapter explores data that were collected from six individual interviews that were carried out with the purposefully selected participants (high achievers on the IQMS evaluation). Table 4.1 shows a short profile of the 6 participants.

*Table 4.1: Overview of participants*

<table>
<thead>
<tr>
<th>Participants</th>
<th>Post level</th>
<th>Learning Areas</th>
<th>Qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educator 1</td>
<td>Educator</td>
<td>Social Science, EMS</td>
<td>BEd Honours (CBE)</td>
</tr>
<tr>
<td>2 HOD</td>
<td></td>
<td>Maths &amp; Computer Applications Technology (CAT)</td>
<td>BEd Degree</td>
</tr>
<tr>
<td>3 Educator</td>
<td></td>
<td>All Foundation Phase Learning Areas</td>
<td>BEd Honours (CBE)</td>
</tr>
<tr>
<td>4 Educator</td>
<td></td>
<td>Life Orientation &amp; CAT</td>
<td>ACE (CBE)</td>
</tr>
<tr>
<td>5 Acting HOD</td>
<td></td>
<td>Maths &amp; CAT</td>
<td>BEd Honours (CBE)</td>
</tr>
<tr>
<td>6 HOD</td>
<td></td>
<td>CAT &amp; Natural Science</td>
<td>BEd Degree</td>
</tr>
</tbody>
</table>

Table 4.1 reveals that the majority of participants who were identified as high achievers on the IQMS evaluation have a degree in Computer-based education. The table also shows similarities in the different learning areas that they teach. A good variety of post levels are also represented.

In this chapter I will now briefly discuss the processes and procedures conducted during the analysis and interpretation of the interview transcripts obtained from these participants. As mentioned earlier, the aim of this research is to establish how high achievers in IQMS perceive the role of computers in their daily teaching. The 6 interviews with individual participants, who were all high achievers in the
IQMS evaluation at their work place, were analysed using a cyclical process of data analysis. In order to do this, according to White (2005, p186), one must be familiar with the data to be able to identify the main themes. I made sure of this point by being the sole researcher analysing the transcripts. I read the transcripts over and over again before attempting to analyse them in order to obtain a detailed idea of the individual settings, participants, and activities. The data were subsequently coded and physically grouped into themes.

![Figure 4.1: Steps in analysis qualitative data (Gay & Airsasian, 2000 in White 2005, p186)](image)

Individual codes within the various themes were then sorted and put into a logical order to form a rough outline of a narrative incorporating all of the educators’ ideas and perceptions about using ICTs in their daily work. The ICT narratives were then matched to a traditional African story. This was done by matching the characteristics of the participant to that of a character in an existing traditional story. The ICT storyline was then blended with the traditional story to form a new blended narrative incorporating both narrative threads.

### 4.2 WRITING OF THE NARRATIVES

At the heart of narratives lies “the way humans experience the world” (Merriam 1998, p157). Telling the stories of the six participants based on themes derived from content analysis methods mentioned in paragraph 3.7 highlights the experiences and perceptions of these educators in a new and exciting way. By using traditional storylines the narratives add a cultural representation to the
stories that may appeal to a wider audience of readers. Denzin & Lincoln (2003, p144) already alluded to the power of using storytelling as a cultural representation within narrative inquiry and the stories that follow below are evidence of that.

4.2.1 The story of Tumi: UMajola the Xhosa snake.

Tumi reminds me of the story of *uMajola the Xhosa snake*. uMajola is a sacred snake that communicates with the Majola clan. The special animal associated with this clan is the Majola snake. It is said that uMajola - which is thankfully not poisonous - likes to slither into a sleeping baby's bed and it is also not unheard of that you will find an infant playing with him. If this happens, it is a sign that the child is a true Majola and there is much rejoicing. It is believed that if anyone kills the snake by mistake, it will bring bad luck to the whole clan. Similarly, Tumi is like a good luck charm to the whole primary school. When he is seen at the school you can rest assured that things are going well. This is just like finding uMajola in your bed. Tumi is the one who is solely responsible for designing the school timetable. He is also using educational software for teaching and learning in the different learning areas. Just like the snake which always reappears when needed, Tumi will just emerge from nowhere and come up with answers for many of the schools’ technological needs.

Tumi enjoys designing educational applications with the tools he learned about in his postgraduate studies. During his spare time he still experiments with new things and tries to apply what he has learned to the school setting. During the time that he is away (not visible) at the school, teachers and other staff start to worry. This is just like when uMajola does not appear to the people in the traditional story and they begin to suspect that things are not as they should be.

Just as uMajola the snake may find it difficult to appear at all the right times to the expectant clan, Tumi also finds it difficult delivering lessons using ICTs as the school only had six donated computers to begin with. Just as uMajola gets around to carrying out all of his tasks, Tumi was assisted when he was later given fifteen more computers (which he described as not being in good condition). There was,
however, opposition in some cases at the school where teachers did not see the benefits of using ICTs in teaching and learning. This is just like the young people in the Majola clan who no longer take their tradition seriously. Modern technologies have changed the way they think about their world. Some of them do, however, return to their traditional beliefs when the snake reappears to guide them. Similarly, some teachers at the school have now seen the benefits of Tumi’s work and can vouch for the added value that ICTs bring to their classrooms.

Tumi can be described as a perfectionist like the snake. He always wants to be there for both learners and the school as uMajola is always there for the Majola clan. Everyone in the Majola clan wants to be associated with the snake because they believe it brings good luck. Everyone in the clan wishes to see uMajola as they believe him to be a symbol of good luck. In Tumi’s case, even the neighbouring schools have started to notice his good work with computers and their teachers are very keen to learn from him and his work.

4.2.2 The story of Girly: The Rain Queen

For centuries the baLobedu people of the Limpopo Province of South Africa have lived near the largest natural concentration of cycads (an ancient plant) in the world. This natural treasure is nestled in the Lobedu Mountains high above the remote village of GaModjadji. When I listened to Girly’s story I could not help noticing the similarities it had with the lives of the baLobedu clan. Just like her school where the women seem to have taken up the reins and are in charge of the daily running of the school, the monarchy of the baLobedu clan and all of its power lies in the hands of its women.

The story of the baLobedu clan and the Rain Queen began over 500 years ago. Legend has it that Princess Dzungungini, daughter of the mighty King of Monomatopa in Zimbabwe, fell pregnant by her half brother and fearing retribution, she fled to settle in the grove of cycads where she was able to survive on her own. It is common in these clans to settle near natural resources that can provide
shelter, food and medicine so the Modjadji forest was a good choice. Before she ran away, the princess stole some of her father’s rain making secrets and soon after that, her son Makaphela then founded the new kingdom of baLobedu. At the turn of the 19th century, following an instruction from the ancestors, it was decided to hand over power to the women of the clan and the first Modjadji took up her place as the Rain Queen. Similarly, Girly settled at her new school where she immediately found shelter and a new functionality among people and structures she was comfortable with. She also became one of the new leaders at the school who happened to be mostly women.

The baLobedu clan is dependent on their queen and believe that she has the power to make rain. These supernatural powers allow her to make rain anytime she wants to and regular ceremonies are held in October where the monarch and traditional healers perform rituals at designated shrines. Girly completed her BEd (Hons) in Computer-based Education in 2006 despite financial and other factors that inhibited the process. Even though her “powers” are not supernatural, but rather simply related to an education in educational ICTs, she does hold some authority at her school. Having this background in educational technologies, Girly boasts about how the school depends on her for so many things. She feels that the school is dependent on her for many things including the design of award certificates and many other administrative tasks. They rely heavily on her skills when the time comes to make submissions to the department. It sounds as if the school cannot function properly without the help of Girly just like the baLobedu clan rely on their Rain Queen. The baLobedu people can suffer as a result of drought if their queen is not creating rain, and similarly the school suffers when Girly is not there to do the ICT related work.

The title of Rain Queen is passed down from generation to generation and as the Queen is not allowed to marry, there can be no spouse to take over as ruler. Only daughters can take on the title of Rain Queen. Most recent Rain Queens have all been very young and have suffered early and untimely deaths. To give some perspective, the last Rain Queen was the only Queen to ever undergo formal education even though the clan elders were against it. Girly is also much younger
than her fellow teachers and colleagues but her age does not limit her in any way at the school and they all still look up to her. The previous rain queen was also very young, but this did not have any influence on her power and all tribal members still looked up to her. At present there is no rain queen. The last monarch died in 2005 leaving behind a young daughter and her brother, the present regent, who acts as ruler until the young daughter is appointed as Rain Queen.

The previous Rain Queen had a great ability for attracting people to invest money in the clan. She did not get much support from the elders but stubbornly insisted on her plan being implemented and today the baLobedu clan is known everywhere for its rain-making queen. The work that Girly did for the awards committee at the school also stands out to this day. She introduced the concept of awards even though the community did not believe that she could succeed. Now the school is also well known for these endeavours.

Girly’s work is unique and most teachers want her help in updating their files. In some cases they want her to actually do the work for them. Girly prides herself on having solutions even in difficult times but her great involvement at the school has sometimes left her drained. She talks about not being able to cope with the demands that ICTs have indirectly placed on her life. The previous rain queen also died in 2005 due to a hectic and full lifestyle. Girly does not want to stop her good work but realises that she must also look after herself if she wishes to continue to be a role model to the teachers and staff at the school.

But for now, life goes on at the new village of gaModjadji. The cycad forest is still shrouded in mystery and the ruins of the old capital of Lobedu lie as a testament to things that have passed. Similarly, ICTs still hold a certain amount of mystery for some of the community members in and around Girly’s school and life will go on with or without the technology. Fortunately there are still strong women like Girly to continue building the legacy of technologies for teaching and learning at the school. Soon Modjadji’s spirit will flow through the village of gaModjadji again but
in the meantime the impact of ICTs in the classroom is still being felt in Girly’s school.

4.2.3  The story of Thato: Imvukuzane (The Mole)

Thato’s story reminded me of the intelligent mole, Imvukuzane. Imvukuzane was the animal that came up with the intelligent idea of trapping animals that were troublesome to other animals. This included dangerous animals like snakes. Other animals just laughed at the idea of the apparently lazy mole trapping snakes because they had not seen Imvukuzane doing any work before. They had just seen him disappearing underground and did not really know exactly what the mole did. Thato’s story is the same. He does not say much as he is reserved and shy.

When he started at his school as head of department, most teachers did not have faith in him as he did not appear to actually do anything. Just like Imvukuzane he had to first go an extra mile to gain recognition from his colleagues.

But firstly, more about Thato... Thato is a Head of Department (HOD) who teaches Maths and Computer Applications Technology. Just like Imvukuzane who always disappears underground to do his work, Thato always disappears into his computer lab to do his work. Nobody actually took the time to investigate what he actually did. Despite that, he has brought in many initiatives with an aim to see more and more educators being computer literate, and using ICTs for teaching and learning. He had a plan to assist all teachers in this quest but found that it was easier to first concentrate on the teacher who put up the most resistance.

Just like Imvukuzane he went for the most dangerous animal first. Imvukuzane managed to trap the big snake in his underground tunnels and only then did all the animals start to respect him in his own right. After trapping his main quarry, Thato could then concentrate on slowly attending to all of the other teachers who were now less wary of him and his shy ways.

Thato now enjoys recognition for his work but still disappears and re-emerges with plans for teaching and learning with ICTs that will benefit the school in the long run. He seems to be on a one way path, just like a blind man (or a blind mole in
this case) but his many followers respect his ideas and have also started to assist him in this quest. So just like the blind Imvukuzane he has managed to lead by example and show that there are many ways to approach a problem.

4.2.4 The story of Neo: Inkosana ehlananiphele (The intelligent prince)

A long, long time ago there was an intelligent prince who lived in a very rich village. People from outside would approach the king of the village wanting to trade with him for his gold but he responded by killing them. He did not want to have anything to do with them and any influences from outside. He was especially suspicious of those who came from over the sea (meaning the white people at that time). This is very similar to the situation in many schools where principals are very suspicious of ICTs and their use in teaching and learning. Some even go to extremes and actively try to keep ICTs out of the schools due to their beliefs and misconceptions.

Going back to the story of Inkosana ehlananiphele, the young prince (the son of the king) was watching his father’s every move. He never approved of what was happening and did not share his father’s views. Neo is the one at the school who fits into this role exactly. He took a while to do something about the situation of implementing ICTs at the school but he was only waiting for the right moment. He was not sitting doing nothing, but was in fact just learning and waiting for the right time to explode into action. Just as in the old story, it happened that the old king fell ill and the prince had to temporarily take over the reins. Neo was eventually given the opportunity to implement his plan and after a long period of carefully planning and watching and waiting he was able to start the process of ICT integration into teaching and learning. Just like in the traditional story where the villagers started noticing how intelligent the prince was, teachers and other staff members soon came to praise Neo’s wisdom and initiative.

Sisi, another teacher in the same school, regarded Neo as very intelligent because of the changes he brought into the school. Sisi was a casual teacher who had never taught CAT before and most people initially thought that Neo was wasting
time by involving Sisi in his plans. But just like Inkosana who knew a good thing when he saw one, Neo believed in Sisi and stuck with her. In the original story the Inkosana knew what he was waiting for when the people from over the sea came to trade with his people. He forged relations with them and traded with gold in return for their help. Neo knew when the time was right and knew exactly when to spring into action regarding ICTs at his school. Just like Inkosanas’ people, Neo’s school has benefited and is still regarded as one of the better secondary schools with ICTs in Soweto.

4.2.5 The story of Ben: Lightning, the son of Thunder

Tradition has it that, a long time ago, both Thunder and Lightning lived on this earth, among the people. Thunder, an ewe, was the mother of Lightning, a young ram. They were not very popular with the people of the area for when somebody said something to lightning that he did not agree with he would fly into a furious rage. In his anger he would begin burning anything he came across. This included huts, corn bins, and even large trees. By damaging crops on the farms with his fire he ultimately influenced a large number of people who got in his way. Ben, our character who epitomises Lightning in the folk tale, also has a way of distancing people. Ben is very outspoken about his opinions on ICTs for teaching and learning in his school which already offends fellow workers. Ben does not hesitate to tell everyone that the school needs him more than he needs the school. He is also very robust and tends to be intimidating to others, often using emphatic gestures to show that he is in control of a situation or to simply get a point across. He confidently boasts to fellow teachers that “computers can replace teachers” and this also intimidates many of those who are not yet technologically literate or competent. He does not mince his words and his “sharp” and concise comments lash out at people like lightning and startle and hurt them in some cases.

In the traditional tale, Thunder, the loud mother would often raise her voice and shout at lightning as loudly as she could to reprimand him. As a result of her loud booming voice neighbours were naturally very upset for a number of reasons. Firstly at the damage caused by Lightning and then by the unbearable noise from his mother that always followed his outbursts. At the school where Ben works, the
teachers often complain to the principal about Ben’s outbursts and his habit of upsetting the natural balance and harmony at the school. The constant rumbling noise of their complaints just seems to add fuel to Ben’s fire and he seems to thrive on creating disparities that he believes will force the teachers to adopt educational technologies into their teaching and ultimately engage with them in their daily practice.

Just like the King in the original story who eventually sent Thunder and Lightning to live at the very edge of the village, the principal encouraged Ben to contain his ideas and to rather promote ICTs through examples of good practice while confining himself to his own world in his classroom. He was advised to avoid causing perturbation amongst teachers but this did not really work. Just like Lightning could still see people as they walked about the village streets, Ben still found it only too easy to continue picking quarrels with teachers even though he had been requested not to. At last the king sent for them again. “I have given you many chances to live a better life,” he said, "but I can see that it is useless. From now on, you must go away from our village and live in the wild bush. We do not want to see your faces here again.” Thunder and Lightning had to obey the king and agree to abide by his ruling so they left the village, angry at the inhabitants. In Ben’s case it was not quite so drastic as he was only reminded to refrain from pushing his strong ideas down on the teachers at the school. He was also asked to once again confine himself to his classroom and to concentrate on his own agenda. This of course left Ben frustrated and just like Lightning who was so angry at being banished that he set fire to the entire bush in the dry season, Ben continued to lash out. Just like the flames that spread to the little farms of the people, and sometimes to their houses as well, the “flames” of Ben’s ideas and dreams about ICTs continued to reach the teachers ears.

The story continues that the king called his counsellors together and after much debate they decided to banish Thunder and Lightning away from the earth, and send them to live in the sky where the people hoped they would not be able to do any more damage. Ben was also banished to his lonely world and remained discouraged by the slow pace of implementation of ICTs in education. As a result
he is considering quitting teaching and “banishing himself completely. Just like Lightning who still loses his temper from time to time and cannot resist sending fire down to the earth when he is angry, Ben is still involved in many teacher development projects at the school that he has initiated and his strong voice is still often heard. Ben is in command knows exactly what he wants. He is roaring for change and still believes that computers can do everything better than educators. The slow transition in education pertaining to ICTs is, however, discouraging him to a point of wanting to quit teaching. The power of his lightning bolts even stretch as far as the district office where he has made his frustrations about ICTs in education known. He has threatened that if the Department of Education does not accelerate its implementation of ICTs into his school, he will definitely quit teaching. One gets the feeling that even if Ben does leave the teaching profession that the effects of his “lightning” will still be felt for a long time.

The following section provides some insight into the analysis of the interviews that were conducted in order to come up with the structures around which the preceding narratives were built. Direct quotations from interviews are provided with further explanations under the main categories that arose from the simple content analysis. Direct quotations have been used to illuminate the 4 categories that emerged from the inductive process and which ultimately led to the development of the story frameworks upon which the narratives were based. These four categories include the role of ICTs in communication, motivating educators, administration, and teaching and learning.

4.3 THE ROLE OF ICTS IN COMMUNICATION

The six educators all revealed in their interviews that they use ICTs for communication in their daily tasks as teachers. Tumi, the uMajola snake, has even set up a template that is used for communicating with both parents and educators. “We used it for e mailing to other schools and from time to time we visit the website” and “we can communicate with other schools using e mails, I can communicate with teachers and parents writing letters on the very computer.” He stresses the need to communicate with parents: “As an educator
you will need to inform them of their child’s progress and events in classroom”.

Thato, the mole (Imvukuzane) uses the School Administration Management System (SAMMS) for communication. “I have used SAMMS for communication... to add on that, SAMMS Programme houses lots of information, parents information, learners information and everything so that is very, very central and that can be very, very helpful and useful.” He also designs templates and saves them when the need arises. He uses technology to make minor adjustments and re-saves templates for future use.

Neo, the Inkosana, uses other software for communication. “Yes, I use a computer to type letters and I have installed software like smart software in my computer which allows me to send SMS.” When he wants to communicate with parents he sends text messages through this system. “This has helped with parental involvement in the school.” It becomes very easy to communicate with parents and this in return increases learner achievement and improves the parent’s relationship with the school. Neo uses electronic mail for communicating with other educators in his cluster, since he is a cluster leader. High school teachers meet every month for cluster meetings. Neo has been a cluster leader for the past three years so from time to time he needs to communicate with his cluster and share resources. He says that “using an e – mail for communication helps with the smooth running of the cluster”. All six participants, in fact, agree that using e–mail “saves time.”

Ben, Lightning son of Thunder, roars with loud laughter, “I just cannot cope if the school had no internet because I communicate most of the time with other schools by emailing them.” He suggests: “The use of web pages to communicate with parents is also very effective, even though some of the parents in township school don’t have access to internet. They must pay money to access internet or go to internet cafes.”
Two of the participants use newsletters to communicate with parents but they have a serious challenge with logistic issues like the shortage of print cartridges. Despite this, “parents find newsletters essential for helping to prepare children for each school day and also to be informed by the important events that are taking place at the school.”

4.4 THE ROLE OF ICTS IN MOTIVATING EDUCATORS

It seems from the interviews that a common theme is that learners need constant motivation to attend to their school work. Most learners lack motivation and they do not attend classes regularly. According to the participants the introduction of Computer Application Technology (CAT), a school subject that simply introduces learners to ICTs, has played a major role in motivating learners to attend classes and to engage with the technology. Evidence of this can be found in the following quote “Computers motivate learners to be always present in class; it also motivates them to be active participants”. The issue of learners bunking classes (playing truant) due to lack of motivation was identified: “they spent more of their time in the toilets than in the classroom.” When it comes to ICTs this problem seems to be alleviated. An excited teacher notes: “they are always competing to be the highest in class so that they can get computer certificates.”

Using a computer for teaching can also be a motivating factor and can lead to higher quality work. All participants believe that their work is superior to that of other educators and that their files are always neater. Neo believes that he “cannot work without a computer”. Tumi believes that “computers motivate teachers to participate in activities”. The participants believe that being able to store such large amounts of work for re-use motivates them to create good quality products. Ben states that “documents can be saved many times without losing quality”. Being able to make backups of their work is also highly motivating as they are ensured of preserving their work.
Most participants believe that being computer literate is exposing them to new ICTs which are very crucial in making the learning experience more interesting for the learners. Others like Ben believe that it is the influence of certain computer literate teachers that is the motivating factor: “more educators are starting to use computers they are being encouraged by the work of the computer literate educator’s”. In most cases high achievers are motivating other educators by training them informally and formally on the use of ICTs for teaching and learning. In the schools where the participants work many teachers are not computer literate. As a result, top achievers are always called in to assist other educators in their schools and also in neighbouring schools.

Tumi believes that “computer literate educators play an important role in a team” and this is supported by Thato who believes that the “work of computer literate educators is always unique because one has managed to supply other educators with important documents after typing then distributing them to other educators whenever the need arises”, this has always been a case in most schools that computer literate educators are the ones who are always typing and distributing important information to other educators, in order to motivate them to update their personal files because filing can be challenging to most educators.

Computer literate educators are in great demand to assist with the smooth running of the school and this can also be a major motivating factor for staff development and retention. The six participants of this study believe that they are top achievers because of their use if ICTs. They believe that ICTs have helped them to be more organised and this in turn has impacted positively on their IQMS scores. Sisi believes that “computer literate educators are high achievers in their learning areas and computers have an impact on their IQMS scores”. All six participants believe that computers have influenced the outcomes of their IQMS scores positively.

The level of motivation of the high achievers of this study has also encouraged educators from surrounding schools. Thato mentions the Education Department’s
initiative to motivate teachers to use technology through the provision of templates: “the GDE motivates educators by supplying them with lesson plans”. Ben adds that “the lesson template saves time”. Four participants believe that GDE is making an effort in supporting and motivating them in the teaching of CAT. Through cluster meetings organised by the GDE they can share their frustrations and subject advisers are present to ease their stress and to inspire these educators to do more in terms of helping learners to be ICT competent.

The high achievers of this study were better qualified than most educators. They also appeared to be self motivated even though they did not get any form of financial assistance. They did not seem to care that the Department of Education is always encouraging teachers to upgrade themselves academically despite not allocating enough funds for this purpose. The six participants of this study are intrinsically motivated educators who are making a difference in the lives of their learner’s and colleagues. Technology seems to provide motivation for these teachers to learn, individualises their earning time and practice, and enhances their career skills making them more marketable as educators.

4.5 USING ICTS FOR ADMINISTRATION

The effectiveness of computers for school administration has long been accepted. Computers manage complex information including budgets and improve office operations. Computers excel in managing data, and can make it easier for teachers and administrators to maintain accurate records to improve school and classroom management (Picciano 1994, p63; Rusten 2002, Online). Computers are known for their capacity and speed, so the six participants use a computer to store large amounts of data for future use. They believe that documents can be saved and safely stored: “I can create backups for future use, I can also print, save, or improve documents”. “Memory stick helps with saving of work and with keeping of documents safe, data stored on a memory stick is always accessible and it can be manipulated and stored”. All participants agree that
the computer is a suitable tool for record keeping and are using them on a daily basis.

At the end of the last semester of the school year all schools are expected to submit their plans for the following year. School administration staff finds it difficult to handle the workload so computer literate educators are often of great help during this time. They handle sensitive and complex information and they need to have backup systems in place. “Computers are able to generate complex timetables, with the introduction of new software like SAMMS developing a timetable is no longer a big issue.” Tumi said that he is responsible for developing the school timetable using SAMMS software. To add another side to the story, Tumi is worried about who will be able to fill his shoes if he gets a promotion post as he is the only person able to operate the system. He is also called in to other schools to assist with timetabling and allocation. Thato also uses SAMMS for timetabling and comments that “most schools have gone for training but they find it difficult to use it so from time to time I must assist”. Neo uses SAMMS but he prefers SMART software. He believes it has more features than SAMMS. These educators are aware of the important role they are playing at their schools and that they are “saving the school money as the school used to pay people to develop timetables.”

Educators must also participate in extra mural activities which also involves some administration which can be done using ICTs (ELRC 2003, p16). Heading a committee can also be a challenge. Tumi believes that “he “manages the smooth running of committees with the assistance of computers”. Important documents of a committee can be “safely stored and also distributed on time to different committee members.” The 2 female participants also complain that they are always elected as secretaries in different committees because of their knowledge of computers but Thato says that this is not only gender related as “in all the committees that I am serving on, I am always elected as a secretary”. He adds that this is not always a good thing as other teachers may be denied the opportunity to learn new technological skills: “and this unfortunate tendency disadvantages other educators because they won’t learn new things”. A
common tendency in many schools is to shift the responsibility to those who are computer literate, because they perceived to be better equipped for many tasks.

4.6 USING ICTS IN THE CLASSROOM FOR TEACHING AND LEARNING

I have already mentioned the tendency of learners to spend most their time outside classrooms so it is imperative for each educator to make their lessons interesting and motivating. In chapter 2 of this study it was mentioned that the IQMS expected an educator to create a positive learning environment. The participants of this study believe that the use of computers helps to create a positive learning environment. Tumi confirms “Computers create a positive learning environment, and also makes a teaching space attractive”. I have already mentioned the motivating power of ICTs. When these spaces are attractive it stimulates motivation and learning and as a result learners become more involved during classes.

Participants find planning of lessons interesting when they can use the Internet as a resource: “The Internet helps to access teaching material and this material enhances teaching” and “I produce teaching aids which are very colourful and attractive, from the clip art board, I get beautiful and clear pictures or drawings”. Not all the schools, however, have access to Internet.

Ben is of the opinion that “soon computers are going to replace educators” even though this sentiment is not shared by other participants. Neo believes that “Computers will never take a place of an educator, but can best be used to enhance teaching”. Participants believe that using a chalkboard can sometimes be a time consuming and they prefer to use an overhead projector instead of always writing long notes on the on the chalkboard. The use of MSPowerPoint is common amongst the 6 participants. Neo believes that “PowerPoint can also be best used for lesson presentations”. He claims that it enhances a lesson by creating an exciting visual learning environment. Some use MSExcel for record keeping in assessment “Excel does the calculations for you and is also the
best for record keeping”. Neo generates assessment rubrics for the whole year and says it makes assessment easier. The 6 participants all speculate on how ICTs have made assessment easier and more manageable.

Participants agree that computers can also be incorporated with other media to promote quality teaching. Neo believes that “the use of multimedia combined with computers enhances the lesson”. Some teachers have explored the benefits of ICTs in this regard and concur: “the introduction of ICT has supported teaching and learning”. They also agree that at present there are still too few teachers who are willing to stand out from the crowd and be counted as true innovators and ICT competent teachers.

4.7 DISCUSSION OF THE FINDINGS

The six participants believe that their quality of work is different from that of other educators. They are of the opinion that ICTs have distinguished them from other educators. Thato supports this when he says “It distinguishes the educator from those who are not computer literate”. This is an indication that they see themselves as superior to other teachers who are not technologically advanced. Their positive self esteem and better intrinsic motivation due to their superior abilities as educators have impacted positively on their assessment on the IQMS and they have received high scores. This has been confirmed by all six participants.

This chapter presents the discussion of the data collected in chapter 3. The discussion of the findings is based on the research question and aims that were stated in chapter 1. The question that guided this study is how do high achievers perceive the role of computer technology in their teaching? The literature review in chapter 2 has been reflected in the discussion where necessary to illustrate how high achievers on the IQMS appraisal perceive the role of ICT in their teaching. To make this more understandable and useful to a wider audience I have chosen to present the main findings as narratives based on traditional folk stories that will lie closer to many South African peoples’ hearts.
The main finding of this study is that the 6 participants who are all high achievers in their field of work felt that ICTs have definitely influenced the outcome of their IQMS scores. Likewise, their interaction with ICTs has definitely changed the way they go about their teaching. They are more motivated, they communicate with ease with parents, staff and learners using ICTs, they are better organised administratively and they all state that their teaching is a step above those around them.

4.8 SUMMARY

This chapter was used to report on the data analysis and the findings of the study. Data that were collected from six individual interviews with high achievers in the IQMS evaluation at their work place were analysed using a cyclical process of data analysis. The data were subsequently coded and physically grouped into themes that were then used as the basis for the construction of individual stories based on traditional folk lore. This was done to target a greater audience and to make the topic of ICT integration more accessible to more people using imagery and stories that are familiar to them and perhaps less imposing. The stories are followed by a brief elaboration on the actual data analysis and how I came to formulate the 4 main themes.

In Chapter 5, I will present an overview of the study, highlight the limitations and suggest recommendations for further research.
CHAPTER 5

5.1 INTRODUCTION

The main aim of the study as stated in Chapter 1 was to establish how high achievers on the IQMS perceive the role of computer technology in their teaching. I also undertook to link IQMS performance standards with ICT competences (dealt with in Chapter 2), to determine, during the empirical component of this inquiry how high achievers on the IQMS appraisal perceive the role of ICT in their teaching, and to represent individual stories of ICT integration in the format of traditional African stories that may be more relevant to the broader African public.

This chapter reports on the findings of this multiple case study and will present an overview of the study, findings, recommendations and conclusions. These recommendations and conclusions were reached and informed by the data presented in chapter four.

5.2 OVERVIEW OF CHAPTERS

Chapter 1 provided a brief background to the study which highlighted the changes in the education system which resulted in the introduction of IQMS appraisal system. The IQMS appraisal system is associated with monetary incentives in recognition for good performance. The introduction of the IQMS encouraged many educators to improve the quality of their work, while others started to explore ICT tools. During the period of 2005-2007 I noticed that most educators with high scores on the IQMS were computer literate. Based on this I arrived at the research question: How do high achievers on the IQMS perceive the role of computer technology in their teaching?
Chapter two provided the relevant literature around the IQMS appraisal and its origins. It also focused on performance management in education, developmental appraisal and whole school evaluation. The final part of this chapter deals with the role of ICT in education, specific ways in which ICT tools helped the educator were looked at with reference to literature associated to it. The topic of teacher development is followed by the role of ICTs in teaching and supported by constructivist theory.

Chapter three covers the research approach. This chapter begins with the research design, then explains the qualitative approach and thereafter focuses on the techniques that were used to select participants. In this section I elaborate on the appropriate instruments and techniques to collect and analyse data in this study. Specific cases are then discussed, followed by data analysis techniques. The credibility of the research is established by making sure that the information is valid and reliable.

Chapter Four focuses on the analysis and interpretation of raw data that were collected through individual interviews, document analysis and informal observation. Data collection and analysis processes were concurrent and helped to form an explicit step in conceptually interpreting the data set as a whole using simple content analysis of the interviews as the major method of analysis to transform the raw data into new coherent depiction of “the thing being studied” (Thorn, 2000 online). In this chapter the stories of the six participants are told using the frameworks of traditional folk stories. These stories are then followed by a brief elaboration on the conceptualisation of the themes that led to the formation of the stories.

Chapter Five provides a summary of the research process including methods and findings. Some of the most important findings are highlighted, limitations of the inquiry are mentioned, and recommendations for further research are made.
5.3 THE FINDINGS OF THE STUDY

The six participants in this study believe that they managed to score high marks in the IQMS appraisal because of their superior skills with ICTs. Although their experiences differed, as seen in the individual stories that are presented, the common theme is one of empowerment. They all feel empowered to carry out their daily tasks as teachers with more authority due to their abilities with ICTs. The feel motivated to do good work and to inspire both fellow teachers and learners in their classes. They stand out from the rest of the crowd due to their superior ICT abilities. They are more capable in four areas than other teachers i.e. communication, motivation, administration, and teaching and learning.

The 5 stories of individual engagement with ICTs are loosely based on a number of traditional folk tales that have been passed down from generation to generation. The stories are presented as such in order to attempt to expose the notion of ICT integration into teaching and learning to a wider audience who may have not have the background or desire to read a more formal academic text. The explanations provided in the stories, however, should also be enough to satisfy the more academic reader with an interest in this topic.

5.4 LIMITATIONS OF THIS STUDY

A limitation of this study is that it was carried out by a novice researcher with no previous research experience. This was a huge responsibility and despite guidance by my supervisor unintentional mistakes may have been made in the process. Upon reflection, many of these issues have now been addressed and I believe that I have reached the appropriate level of novice scholarship as evidenced in this mini-dissertation.

As a top achiever myself, and as a person who is fully involved in teacher development, a co-ordinator of a School Development Team, and a Student of educational ICTs, I had to make sure that I was not biased in any way. I sometimes found myself interrupting the interviews, trying to lead them. I had to
repeat two of the first interviews because I wanted to make sure that the data were valid. This is all part of the process of learning to be a novice researcher.

My other challenge was the world of narratives. I often found myself lost in the midst of these stories and only towards the end of the writing process did the stories become truly meaningful to me. It is my hope that my small contribution in this narrative field will encourage other non first-language English writers to persevere with their writing and to try new things that can ultimately enrich someone else’s learning.

Another limitation is that the research only includes 6 high achievers but upon reflection I can now see that many of the stories already show marked similarities. Data saturation would surely occur after a few more interviews and I predict that many of the stories would be similar if high achievers were the target group.

5.5 RECOMMENDATIONS FOR FURTHER RESEARCH

According to the White paper on e-education (DoE, 2003) every South African learner in the general (GET) and further education and training bands (FET) will be ICT capable by 2013. The e-education policy further states that the minister of education wants learners by 2014 to acquire the necessary ICT skills that will help them to be competent in the outside world. Conducting this study offered me the opportunity to observe and ask questions about ICTs in many schools that were not part of this study. I was shocked to learn about the number of educators who cannot use computers (computer illiterate?) in township schools and even in the schools that were part of this study.

Change is not welcomed by all because it means that people must step out of their comfort zones and learn new things. Some educators’ feel that the IQMS appraisal system will be another failure but no such research has been carried out to verify these predictions or speculations.
The issue of using high achievers to train and uplift teachers regarding ICTs in education can also be explored even further.

Similar research to this study using quantitative or a mixed method approach and a bigger sample may be enlightening.

5.6 A FINAL WORD

In the past years the education department has experienced an exodus in computer literate educators. This is a great loss for the teaching profession. There are so many reasons for this exodus and there is still so much that needs to be done to take the education system to the next level. The message that seems to come through in this study is that we should improvise and use what we have and not allow our computer laboratories to be turned into ‘white elephants’.

ICTS can be infused successfully into teaching and learning and perhaps we might achieve the ministers’ objective in producing totally ICT competent teachers and learners by the year 2014. If educators can bravely jump out of their comfortable, familiar patterns of engagement into a new ICT adventure we can easily reap the rewards of our own actions in the schools. There is nothing as frightening as ignorance in action. Not initiating innovative and responsible change is far more risky than standing still.


[http://www.okstate.edu/ag/agedcm4h/academic/aged59809.htm](http://www.okstate.edu/ag/agedcm4h/academic/aged59809.htm). (Accessed 18 August 2007)


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Appendix A

Lorraine Nombuyiselo Mabitsela
Candidate: M Ed (ICT)
Student number: 920172137

The Participant Educator

I am currently studying in the Department of Mathematics, Science, Technology & Computer Education (Faculty of Education) at the University of Johannesburg and I am engaged in a research project. The main aim of the study is to establish how high achievers in the Integrated Quality Management System (IQMS) perceive the role of computer technology in their teaching.

Research is a means of generating knowledge about areas that we are not familiar with. Not much knowledge has been generated with regard to ICT in education, especially in Township schools. This study seeks to understand how some of these educators who have achieved high scores on the IQMS perceive the role of computers in their teaching practice.

Having provided you with the brief background to my study I would like to invite you to consent to being a participant in this study. The procedure that is going to be followed in order to complete this research is detailed below:

1. I will visit the school on the day that is convenient to you to conduct an interview. All information that will be shared during the interview will be tape-recorded and kept in a safe place for the duration of the study and will later be destroyed.
2. I will observe you during the normal school day to see how you utilise ICT in your teaching practice.
3. I will also need to view your IQMS records from 2005 to 2007 as I need to focus on high achievers in this inquiry.

You are at liberty to withdraw from the study at any time and you will not be persuaded or convinced to stay on. I will also ensure that you will not be caused any harm. Your identity will be protected by allocating pseudonyms and all information will be regarded as confidential. Findings of this inquiry will be made available to you for comment on completion of the inquiry.

Accordingly, I hereby request that you sign this document in the space provided below in order to indicate that you are aware of this research and that you are giving me permission to conduct this research with you as a participant.
This letter needs to be signed and dated as it forms part of the requirements for ethical research as mandated by the Ethics Committee of the Faculty of Education.

Thanking you in anticipation

__________________________________________  ____________________________
LN Mabitsela                           Participant

I, the undersigned, .........................................................., do hereby indicate that I have read and understood the aim and reasons for undertaking the above-mentioned research as contained in the attached letter. I hereby give my written consent to be interviewed, and observed by LN Mabitsela.

Date:______________________________
Appendix B

Lorraine Nombuyiselo Mabitsela
Candidate: M Ed (ICT)
Student number: 920172137

The Principal and School Governing Body

I am currently studying in the Department of Mathematics, Science, Technology & Computer Education (Faculty of Education) at the University of Johannesburg and I am engaged in a research project. The main aim of the study is to establish how high achievers in the Integrated Quality Management System (IQMS) perceive the role of computer technology in their teaching.

Research is a means of generating knowledge about areas that we are not familiar with. Not much knowledge has been generated with regard to ICT in education, especially in Township schools. This study seeks to understand how some of these educators who have achieved high scores on the IQMS perceive the role of computers in their teaching experience.

Having provided you with the brief background to my study I, hereby, ask permission to conduct this research at your school. I have chosen one participant from your school who is computer literate. The procedure that is going to be followed in order to complete this research is detailed below:

1. I will visit the school on the day that is convenient to you and the participants to conduct the interview. All information that that will be shared during the interviews will be tape-recorded and kept in a safe place for the duration of the study and will later be destroyed.
2. I will observe the participant during the normal school day to see how they utilise ICT in their teaching practice.
3. I will also request to view the participants IQMS records from 2005 to 2007 as I need to focus on high achievers in this inquiry.

The participants are at liberty to withdraw from the study at any time and they will not be persuaded or convinced to stay on. I will also ensure that the participants will not be caused any harm. Their identities will be protected by allocating pseudonyms and all information will be regarded as confidential. Accordingly, I hereby request that you as the principal of the school sign this document in the space provided below, in order to indicate that you are aware of this research and that you are giving me permission to conduct this research at your school. You will be given access to the findings of the research on completion of the inquiry.

This letter must be signed and dated as it forms part of the requirements for ethical research as mandated by the Ethics Committee of the Faculty of Education.
Thanking you in anticipation

______________________________  ________________________________

LN Mabitsela                           Principal

I, the undersigned, ....................................................., hereby indicate that I have read and
understood the aim and reasons for undertaking the above-mentioned research as contained in the
attached letter. I hereby give my written consent to LN Mabitsela to continue with the inquiry at this
School.

Date: ______________________________

UNIVERSITY OF JOHANNESBURG