Teachers' emotional experiences in integrating ICT in the curriculum

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By

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Declaration of originality

I, Salome Sophia Pulane Molope (22360647) hereby declare that all the resources that were consulted are included in the reference list and that this study is my original work.

S.S.P. Molope

May 2006

Summary

Teacher's emotional experiences in integrating ICT in the curriculum

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In this study the emotional responses of the teacher's experiences in integrating ICT in the curriculum were identified. Teachers' experiences were explored regarding challenges and benefits of incorporating ICT in their teaching. The aim of this research was to attempt to contribute to the field by investigating the affective aspects according to Krathwohl's taxonomy. The study employed a qualitative approach where data was analysed through narrative stories, interviews and observations. The design was used to capture the life stories of the five teachers who were integrating ICT relating to their experiences and emotional responses.

Data was analysed by conceptual analysis after which, ten emotional response themes were identified. The ten emotional responses were then concatenated into four categories namely: hope, joy, anger and fear. This study found that teachers do experience complex emotions in response to the integration of ICT although there is a positive effect on instruction when information and communication's technology is used optimally.

Key words

Information and communication technologies
Technology integration
Learner
Perceptions
Personal experiences
Krathwohl's taxonomy
Curriculum
Educator/ teacher
Emotions
e-Education

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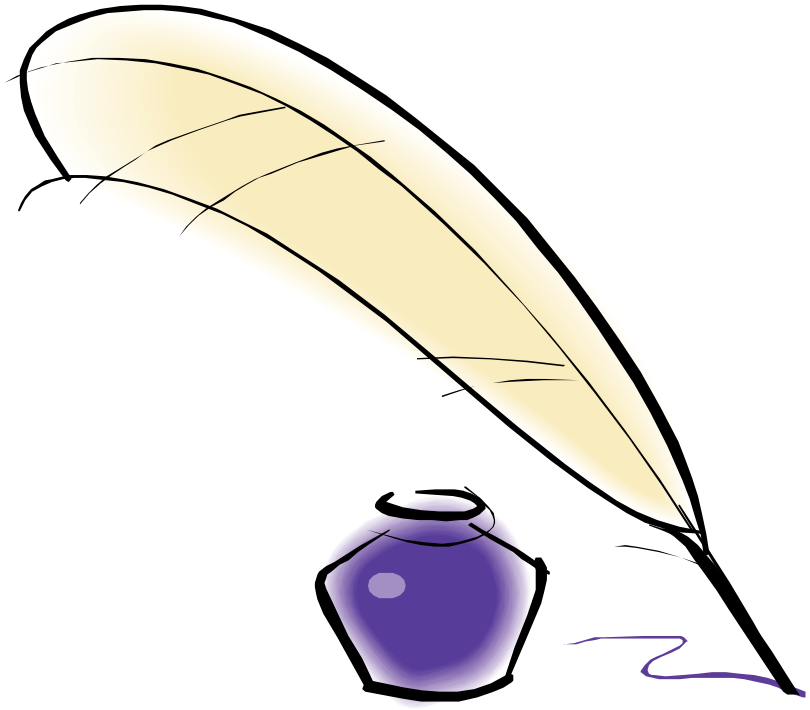


Successful modern economies and societies require citizens with a strong foundation of general education, the desire and the ability to continue to learn, adapt to, and develop new knowledge, skills and technologies to move flexibly, take responsibility for personal performance and to set high standards (SAQA, 2001).

Chapter 1
Background Information

1.1 Introduction

The focus of this study is exploring the emotional experiences of teachers integrating Information and Communications Technologies (ICT) in the school curriculum. It reports on the challenges and the successes the teachers experience in trying to incorporate ICT to meet the demands of technology of the current century. According to the Department of Education, (2004: 6) information and communications technologies are central to the changes taking place throughout the world. Digital media have revolutionised the information society and advances in ICTs have dramatically changed learning and provide access to educational resources well beyond those traditionally available. The overall picture that emerges from primary teachers is a relatively positive one in the sense that there is a great deal of interest and motivation to learn more about the potential of ICT; educators acknowledge that ICT is the direction education is likely to take in the future. Indeed, the vast majority of primary teachers currently say they make use of some computer-based resources at some time in their professional life (Wright, 1999) but little information is available on the emotional experiences of teachers in integrating ICT in the curriculum.

According to Wideen and Andrews (1997) teaching is a profession that embraces challenges and change with equanimity and success to such an extent that a teacher who is not growing personally and professionally is unlikely to bring about significant improvement in the classroom programme. I have used this explanation to explore the emotional experiences that teachers are faced with when improving themselves technologically in order to help the learners to cope with the demands of technology.

Chalkley and Nicholas (1997) state that because teachers form a professional group that is involved in information provision, it is imperative that the information gained be shared in the learning process. Today's technology standards (International Society for Technology in Education, 2000) challenge teacher education programme across the nation to address the need for producing computer literate educators who are not just knowledgeable of the Internet, but are also confident in their ability to incorporate instructional software and websites into everyday classroom teaching.

Henry and Stone (1997) link the years of teaching experience with teacher age, stating that typically teachers with more years of teaching experience tend to have more trouble with the integration of technology. I use this statement to try to explain how the teachers battle with the use of ICT in their practice. The use of information and communication technologies is gradually gaining momentum. With the advancement of computer technology, especially the availability and extensive usage of the web, a dramatic change has come in the way our societies deliver information. Technological powers have brought tremendous convenience to our everyday lives by linking technology with the curriculum and this has brought about significant changes in teaching and learning. Wright (1999) states that teacher achievement, attitudes and teacher-learner interaction and interactive learning have made teaching possible via technology.

1.2 Background to the study

This study is informed by the manner in which an ICT department at school is moving towards the use of ICT and the vast infrastructure that is readily available for teachers. One of the schools in the North-West Province has already transformed its curriculum to suit the ICT environment in which learners are taught with the computers. The teachers are already using ICT to plan their lessons and prepare their work on computers. Although there are hindrances in terms of funding, the school has taken it upon itself to further this mandate. There are observable attitudes in the usage of computers by the teachers; this study will research these attitudes.

In this study the perceived value of behaviours and experience relates to the ongoing encounter of the teachers with the ICT oriented environment and the critiques they are faced with. I found this model to be relevant in my study as most of the teachers in school were not computer literate when the idea of integrating ICT in the curriculum was introduced to them by one of the teachers who was already in the process of doing her master's degree in ICT. When they heard of the wonders the computer is capable of doing, they never looked back but immediately developed interest and were curious to know how this gadget was functioning. Two computers were donated to the school. The external variable, the computer, was perceived as a useful tool to be used by the teachers. Although the use of the computer at this time was not easy, teachers did not develop a negative attitude towards the computer usage. Instead, knowledge construction that is social by nature took place on two levels of intellectual development: the social level through interpersonal interaction and the individual

level. I found the teachers responding really well to the interaction, which took the form of a range of actions that were directed towards these conscious objectives of learning.

1.3 The aim of the research

The purpose of this study is to investigate the emotional experiences of teachers towards the integration of ICT in the school curriculum. This aim can be refined by the following question:

> What are the teachers' emotional experiences in integrating ICT in the school curriculum?

In order to give a better understanding of the scope of study, the following concepts that are defined in Table 1.1 will be addressed.

Table 1.1: Definition of basic terms

Term	Definitions
Curriculum	Curriculum is defined as "an organised set of intended learning outcomes presumed to lead to the achievement of educational goals" (Posner & Rudnitsky, 1982).
Teacher	The word teacher is defined as an independent, self reliant, fully matured, strong to render aid. In fulfilling his functions of support and aid, the educator assumes responsibility for education. Denying this responsibility he would be powerless to help (Van Rensburg & Landman, 1996).
Emotions	Personal experiences that arise from a complex interplay among physiological, cognitive and situational variables, which allow psychologists to understand diverse expressions of behaviour (Magill, 1996).
e-Education	In the South African context, the concept of e-Education revolves around the use of ICTs to accelerate the achievement of national education goals by connecting learners and teachers together for professional support service (Department of Education, 2004).
e-Learning	e-Learning is flexible learning using ICT resources, tools and applications focusing on accessing information and propagating interaction among teachers, learners and the online environment (Department of Education, 2004).
Information and communication technologies	Technology resulting from increasing convergence and integration of computing, electronics and telecommunications, allowing the exchange of messages by telephone (fixed or mobile and e-mail, access to information and public debate on several issues through the internet, television, radio, video conferencing and delivery of high speed wide band services (Howie, 2005).

Term	Definitions
Information literacy	The ability to locate, evaluate, manipulate, manage and communicate information from different sources (Department of Education, 2004).
Internet-based learning	Learning that takes place as a result of a programme designed to explore the power and the potential of the Internet, directed to promote problem solving and higher order thinking skills (Miller, 1997).
Learner	Anyone who accesses information to increase his or her skills and knowledge (E-learning Frames, 2001).
Perceptions	Perception is the process of acquiring, interpreting, selecting, and organising sensory information (The Dictionary of the History Of Ideas, 2003).
Personal experiences	Defined as the memory representation of a specific event at a particular time and place, a verbal narrative account of the event accompanied by sensory images (Pillemer, 1998).
Technology integration	Technology integration is defined as a combination of all technology parts, such as hardware and software, together with each subject-related curriculum area to enhance learning and teaching (Cashman, Gunter, Gunter & Shelly, 2004).

1.4 Stating the rationale

It would appear that the conditions for classroom learning can be improved by information technology tools. However, teachers can use information technology to create a new set of mundane tasks which negate the opportunities for quality learning (Davis, Bagozzi & Warshaw, 1989).

We are living in a world of computers. Most of the educational programmes that are meant to support and educate learners are programmed for computers. For the learners to make the most of the information that is at their disposal, they need to understand how to operate computers in a web-based learning environment. More institutions are seeking ways to use on-line tools to deliver instruction as the technological infrastructure expands in terms of its capabilities and power (Katz, Evans & Francis, 1999). ICT is about the application of Information Technology and Information Communication Technologies to education. It is of paramount importance to note that ICT begins with an understanding of the needs and possibilities for learning and instruction. One can start with what learners wish to accomplish and look at how the new technologies make learning more possible by propagating participation or increasing engagement, and how they can contribute to raising standards of attainment and the quality of the teacher's emotional experience.

In my experience as a Computer Integrated Education (CIE) Honours student at the University of Pretoria I observed the manner in which learners were performing without the use of computers, the manner in which they struggled with their second language (English) and the workload the educators were faced with in terms of compiling schedules, reports and designing lesson plans. This process forced me to introduce ICT programmes at school wherein two teachers were already in the process of transforming the curriculum towards an ICT paradigm, so I decided to investigate the experiences of the educators in integrating these programmes. The findings from this research can be useful to:

- Teachers in both the Foundation and Intermediate Phase
- ICT Curriculum development specialists
- Provincial policy makers who design Information and Communications Technologies for schools and classrooms.

Hawkridge (1990) in his research on computers in schools of developing countries, regards learning about ICT as arising from a social rationale in which all citizens are entitled to learn how to use the new technologies, which will become increasingly important in their lives. In fact, teaching about ICT occurs in all schools in the United Kingdom; it is part of the National Curriculum. With the introduction of ICT as a key skill, the distinction between learning about ICT and learning through ICT will become blurred as students develop their ICT capability.

The current state of affairs and development of ICT – and particularly the growth of Web-based information services – give education a significant opportunity to change the way schools can function to the benefit of all. ICT offers choices for learners and educators that will change the culture of education and learning. The World Wide Web also provides new opportunities for enhancing education via the Internet. The web combined with the Internet is fast emerging as one of the educator's most important tools, with the World Wide Web becoming the easiest and most popular way to access the Internet.

Information and communication technologies (ICTs) have an impact on the economic, academic, social, political, cultural and other aspects of life. The prolific growth of human knowledge and the shrinking of the traditional communication barriers of time and space are two such aspects. As the range of human knowledge increases, so does its capacity for being transmitted faster, more easily and in bigger bulk than before, thereby rendering human endeavour, in all spheres, seemingly limitless. ICTs are increasingly influencing values, principles and activities, even of people who do not know what these technologies are. In organisations, ICTs have become an important ingredient in as ICT resources are increasingly linked to the overall organisational strategy, and ICT-related decision-making

has attained high importance internationally; ICTs are viewed as one of the means of effecting global integration for social and economic development. The educational sector is rearing towards that kind of progress so as to be rated on a global market (UNDP, 2001).

There is no doubt that the use of ICT in learning has a powerful influence on instruction. The lecture theatre makes possible the presentation of the text and images to all those in the room and the networked computer makes access possible to a vast range of digitised information. The integration of ICT makes some activities possible and constrains others but it does not change the fundamental processes of human learning. Students still need to engage with what is to be learnt and have to have the ways of expressing their understanding if they are to be confident learners of Curriculum 2005 (Stephenson, 2001).

1.5 Conceptual framework

Perceptions of teachers with regard to the integration of ICT in the curriculum are gradually changing towards the new paradigm. Amongst primary school teachers, the use, or non-use, of ICT is not confined to any particular group of teachers. For primary teachers, the use of ICT resources is not related to age or time in teaching. It cannot be assumed that newly qualified teachers will be any more or less inclined to use ICT in the classroom. In the interviews, experienced teachers talked of the widely varying ICT skills and knowledge levels they saw in new teachers entering the profession. However, a recent study of final year student teachers suggests that, while the majority of new graduates going into teaching will have a reasonable level of basic ICT competence, many feel they lack competence and confidence to apply and integrate ICT in classroom practice (Newman, 1997).

1.6 The research plan

Various sources were consulted to find literature on the experiences of teachers in integrating ICT in the curriculum. These include among others printed journals, books, printed materials and published theses. The study will follow a research design based on qualitative approaches of inquiry. Given the nature of the enquiry, qualitative research is concerned about the understanding of the social phenomena from the participants' point of view and by narrating participants' meanings for these situations and events. Participants' meanings include their feelings, beliefs, ideas thoughts and actions (McMillan & Schumacher, 2001).

A qualitative approach is more appropriate to this study because qualitative research, as opposed to quantitative research, employs primarily inductive reasoning. The problem is most clearly stated after much data collection and preliminary analysis. Inductive analysis allows one to explore and discover with an emergent research design rather than test deductions from theories in predetermined design (McMillan & Schumacher, 1993).

1.6.1 Data collection strategies

The study will use qualitative research based on the experiences of teachers in integrating ICT in primary school. The following strategies will be used in the collection of data:

- Narrative stories
- Focus group interviews
- Observation.

Labuschagne (2003) defines qualitative research as mainly concerned with the properties, the state and the character or nature of phenomena. He further explains that the word *qualitative* implies an emphasis on processes and meanings that are rigorously examined but not measured in terms of quantity, amount or frequency. Qualitative methods typically produce a wealth of detailed data about a much smaller number of people and cases. Qualitative data provide depth and detail through direct quotation and careful description of situations, events, interactions and observed behaviours.

1.6.2 Data collection matrix

The table below illustrates the research questions relating to the research instruments and the specific chapters in which the results will be reported.

Table 1.2: Data collection strategies

Research Instruments / Research Question	Observation	Interviews	Narrative stories
What are the teachers' emotional experiences in integrating ICT in the curriculum?	✓	✓	✓

1.6.3 Participants of this study

Qualitative research is concerned with in-depth inquiry, participants' perspectives and the description of single setting, not generalisation to many settings, and therefore requires participants different from those found in quantitative research (Gay & Airasian, 2003:115). In this study, I will request approval from the school's principal and governing body to conduct the study. My research participants are five teachers teaching ICT in a primary school. Although some of the participants have not received intensive tuition in their teaching careers, they are currently involved in the teaching of ICT. I will then contact these teachers through meetings to explain to them the terms of reference in letters of consent as laid out in Addendum A: 2. The emphasis will be placed on the confidentiality, anonymity and voluntary participation. An appointment for a focus group interview will then be scheduled with the teachers who agree to take part in the study.

1.7 Limitations of this study

This study focuses on the emotional experiences of teachers in integrating ICT in the primary school curriculum. It does not address the issue in the senior phase. The results therefore reflect the emotional responses of only some teachers who are engaged in the integration of ICT in the curriculum. The principle of subjectivity is also addressed because the researcher is closely related to the participants. The development of the information resource is my brainchild and as a result, I tried to avoid as far as possible interpreting experiences in a biased way.

It has to be noted that because this study is qualitative in nature, from an interpretive paradigmatic viewpoint, its aim is essentially to reflect the voices of only those teachers who are engaged in ICT integration and not to generalise the findings to the entire body of teachers. The size of the group of participants is very small and it is therefore not representative of the intended target group.

1.8 Value of the research

Today's technology standards challenge teacher education programmes across the globe to address the need for computer literate teachers who are confident in their ability to choose and incorporate instructional technology into their classroom teaching. This statement tries to redress the imbalances of the past regime by addressing specific aspects of education as its priority regardless of the teachers' state of location and background. This research aims to

show how the extent to which teachers at Success (pseudo name) has integrated ICT in its curricula, regardless of not having studied ICT in their teaching careers. It is hoped that this study will lay the foundation for further research that will focus on the views, needs and the expectations for the application of ICTs in instruction and learning.

1.9 Demarcation of the study into chapters

The research proposal will be divided into the following chapters:

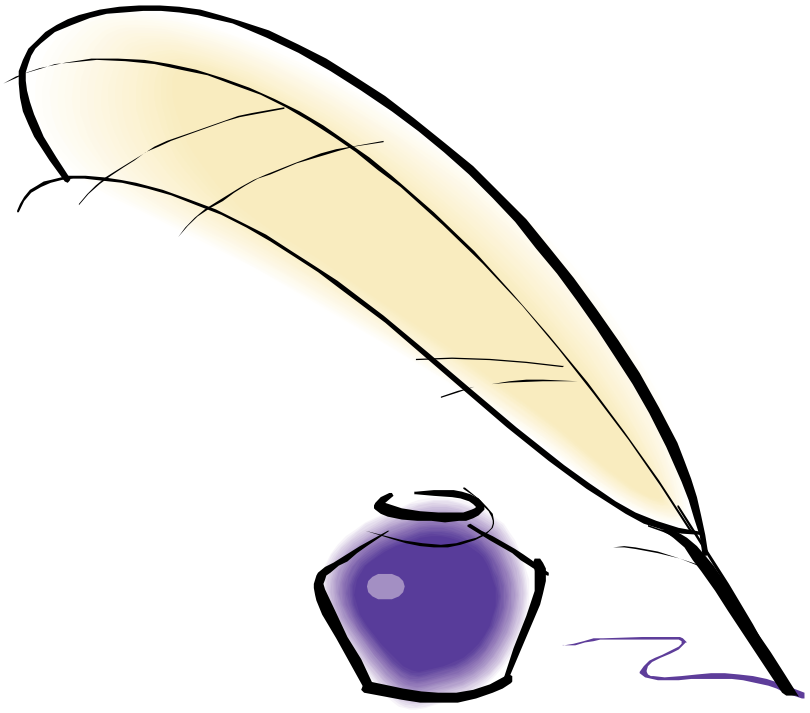
Table 1.3: Demarcation of study into chapters

Chapters		Description
No.	Title	
1	Background Information	This chapter will present the introduction to the research study, the aims of the study, the context in which the study takes place and the definition of concepts
2	Literature Review	A theoretical framework in which the study was done will be presented
3	Research Design	The research question will be addressed together with subjects of the research and the data collection methods
4	Research findings	This chapter will address what the subjects have to say about the use of ICT in primary schools
5	Conclusions and Recommendations	A summary of the previous chapters together with the recommendations will be provided

1.10 Conclusion

It is the aim of this study to establish whether the teachers experience success when integrating ICT in the curriculum. This study will attempt to identify and explore the experiences of teachers in order to deepen our understanding of discovering why and how some of the participants are showing certain emotions. The following chapter provides a more in-depth description of the conceptual framework for this study.

Chapter 2



What is required is that researchers understand the implications of their research perspective and act in ways that reflect that knowledge ensuring a perspective that is compatible with own research interest and predisposition (Orlikowski & Baroudi, 1991).

Chapter 2
Literature Review

2.1 Introduction

The aim of this study is to describe how teacher learning in the affective domain has been experienced within the five years of introducing ICT as a learning area in the school curriculum. This chapter provides a more in-depth discussion of the literature review and conceptual framework of the study where relationships among the concepts are explored and highlighted. Relevant literature discussing emotional responses of the teachers integrating ICT in the curriculum is also explored.

Educators involved in this study experienced remarkable challenges and successes. I am of the opinion that teachers' experiences within an enriched learning environment such as an ICT oriented environment can assist them in developing the personal traits, teamwork and interpersonal skills desired by future education employers. This makes it possible for educators participating in the learning process not only to achieve learning objectives in the cognitive domain (technical skills and knowledge) but also to benefit from those in the affective domain (values and attitudes) (Krathwohl, Bloom & Masia, 1964).

Lane (2001) explains the circumstances during the 1950s when Benjamin Bloom led a team of educational psychologists in the analysis of academic learning behaviours. The results of this team's research produced what is known today in the field of education as Bloom's Taxonomy. Although this hierarchy of learning behaviours was categorised into three interrelated and overlapping learning domains, my focus is on the affective domain (Lane, 2001). This study describes in detail the educator's experiences in integrating.

The affective domain has received little attention and is less intuitive than the cognitive; it is concerned with values, or more precisely perhaps with perception of value issues, and ranges from receiving through to being able to distinguish implicit values through internalisation (Krathwohl, Bloom & Masia, 1964).

I concur with the statement of Hatch (2002) about narrative stories when he states that "Qualitative research is focused on gathering and interpreting the stories that people use to describe their lives" (p. 28). A narrative design is used in this study because telling stories is

part of life that people encounter every day in their conversations with others and people are storytellers by nature (Lieblich, Tuval-Mashiach & Zilber, 1998).

2.2 Models of integration of ICT in the school curriculum

Before teachers can begin to develop integration skills, they must realise and understand how the integration of technology can enhance teaching. Research shows that using technology in the classroom motivates educators to become problem solvers and explorers of new information. To illustrate the importance of using conceptual theories in an ICT curriculum, I have focused on the core set (Malone's Motivation Theory, the Technology Acceptance Model and Krathwohl's Taxonomy and Rogers' Model) of understanding the teacher's experiences. The notion of ICT integration and mediation becomes fundamental when using the above-mentioned models. In trying to gather the models of ICT which educators experience when integrating ICT in the curriculum, the following models were identified as appropriate to be used in an ICT environment: The Technology Acceptance Model, Krathwohl's Taxonomy of the affective domain and Malone's Motivation Theory (Malone, 1981). The Technology Acceptance Model was introduced to try to search ways of how educators cope with the integration of ICT in the school curriculum dating back from the time they trained as educators and the challenges they experienced which forced them to pursue an ICT career. A brief explanation of the models will follow below.

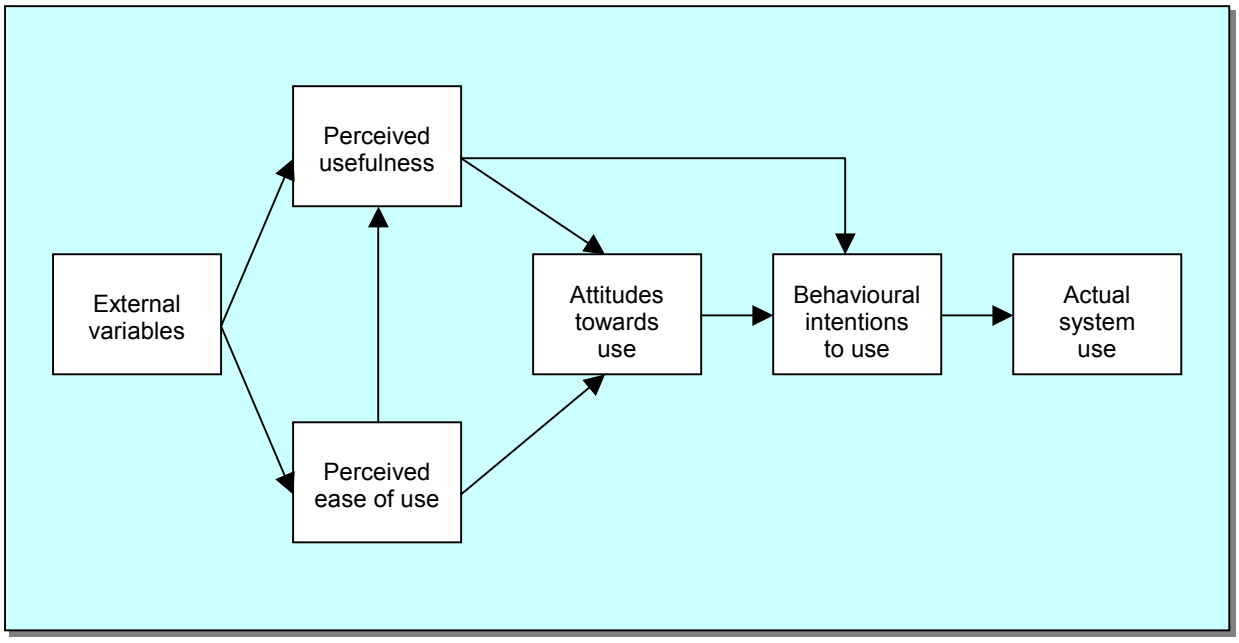
2.3 The Technology Acceptance Model

Davis, *et al*. (1989) developed a theory of 'action relating to reasons' (Technology Acceptance Model) based on the work of Fishbein and Ajzen (in Davis *et al*., 1989) to investigate the reasons why some people use computers and their attitudes towards them. Their model, shown in Figure 2.1, links the perceived usefulness and ease of use with attitude towards using ICT and actual use (system use). They tested this model with adult users who had been using a managerial system for 14 weeks. They found that people's computer use is predicted by their intentions to use it and that perceived usefulness is strongly linked to these intentions. The attitudes and the experiences are incorporated parts of the human actions, which carry a particular culture and history and as such, influence how human actions are operationalised. This supports the work of Ajzen (1988) and others who have found that a positive attitude towards experiencing certain tasks is related to the perceived value of those behaviours.

These experiences could be seen in their behavioural practices because they kept on asking when they were going to be taught how to use the computer. Through the mastery of

teaching from experience, the everyday actions of the educators led to new activity collectively generated by ICT. A project was then developed to teach the educators at school level with the two computers that were available. The educators immediately accepted the project and that was the time when the Technology Acceptance Model was conceived. The Technology Acceptance Model is illustrated in Figure 2.1 below:

Figure 2.1: The Technology Acceptance Model



[Adapted from Davis, Bgozzi & Warshow (1989)]

2.2.2 Krathwohl's taxonomy

In this study I have adopted Krathwohl's Taxonomy of the affective domain to map out the experiences of the eteachers. The experiences of integrating ICT are based on Krathwohl's taxonomy, which is perhaps the best known of any of the affective taxonomies (Seels & Glasgow, 1990). As stated earlier in Seels and Glasgow (1990) "The taxonomy is ordered according to the principle of internalisation. Internalisation refers to the process whereby a person's affect toward an object passes from a general awareness level to a point where the affect is 'internalized' and consistently guides or controls the person's behaviour" (Seels & Glasgow, 1990:28).

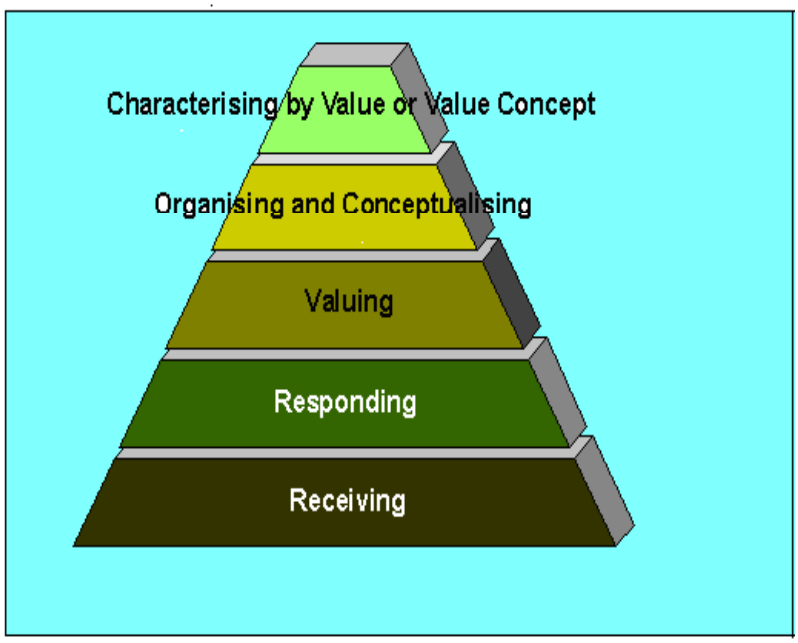
Educational employers of the new ICTs are not only concerned with eteachers' technical competence and problem-solving skills but also place a high value on their personal traits and their interpersonal and teamwork skills. It is therefore valuable for teachers not to

achieve learning objectives in the cognitive domain only, (technical skills and knowledge) but also that they learn in the affective domain (values, attitudes, meta-learning, etc). By experiencing an enriched learning environment, the opportunity for teacher's involvement and motivation is maximised, preparing them for professional practice and lifelong learning (Seels & Glasgow, 1990).

This study describes in detail how the teachers' experiences in integrating ICT place more emphasis on the affective domain. Most educators viewing values education from the perspective of inculcation see values as socially or culturally accepted standards or rules of behaviour. Valuing is therefore considered a process of the educator identifying with and accepting the standards or norms of the important individuals and institutions within his society.

There are, however advocates who consider an individual to be a free, self-fulfilling participant in society who tends to inculcate values such as freedom to learn from his experience, human dignity, justice and self-exploration. In order to give a thorough explanation, Figure 2.2 gives the schematic levels of Krathwohl's Taxonomy of the affective domain.

Figure 2.2: Krathwohl's taxonomy of the affective domain (Bloom et al., 1973)



[Adapted from Huit (2001) and Little (1998)]

I have used this taxonomy in my study because I believe that the educators experience all these levels. I incorporated this taxonomy as learning in the affective domain is concerned with value development and personal and aesthetic development which is the case with the educators of ICT. A taxonomy of learning in the affective domain is described by Martin (1989) and Krathwohl *et al*. (1956). The levels are as follows:

- Receiving: sensitisation to stimuli
- Responding: actively attending/participating
- Valuing: consistent adoption of behaviour incorporating a value or attitude
- Organisation: adoption of a combination of values and/or attitudes
- Characterisation: internalisation and adoption within a value hierarchy affecting behaviour.

Other theorists providing support for the values clarification approach include Asch (1952) and Murphy (1958). While values related to two differing teaching activities (cognitive and affective) may be in conflict, it appears that there are some other more pervasive, internalised values in the educator participants' respective affective-cognitive systems.

As discussed in Seah, Bishop, Fitzsimmons and Clarkson (2001) these overriding values represent the apex in the taxonomy of educational objectives (affective domain). Krathwohl *et al.* (1964) characterise an individual and his/her actions at this level where the individual "responds very consistently to value-laden situations with an interrelated set of values" (Krathwohl *et al*., 1964) overriding other values whose respective degree of internalisation may correspond to lower levels of the internalisation continuum (such as valuing and organising). In other words, knowledge and an understanding of what these overriding values are for a particular educator may help customise professional development programmes to socialise these teachers in more positive and proactive ways. Table 2.1 gives a brief explanation of Krathwohl's levels of the affective domain.

Table 2.1: Krathwohl's taxonomy of affective domain

Affective Domain			
Level	**Illustration**	**Example**	**Action Verbs**
Receiving	Being aware of or attending to something in the environment. Shows awareness of the importance of learning. Open to experience, willing to learn new technologies.	Person would listen to a lecture or presentation about a structural model related to human behaviour. Makes time for learning experience.	Asks, chooses, describes, follows, holds, locates, selects, replies, uses.

Affective Domain			
Level	**Illustration**	**Example**	**Action Verbs**
Responding	Showing some new behaviours because of experience. Volunteers for tasks. Active participation on the part of the student Shows interest in subject	The individual would answer questions about the model or might rewrite lecture notes the next day.	Answers, assists, conforms, greets, discusses, helps, performs, presents, reads, recites, tells, writes.
Valuing	The worth or value a student attaches to a particular object or behaviour.	The individual might begin to think how education may be modified to take advantage of some of the concepts presented in the model and perhaps generate a set of lessons using some of the concepts presented.	Completes, describes, follows, forms, initiates, invites, joins, justifies, proposes, reads, reports, shares, studies, works.
Organisation	Integrating a new value into one's general set of values, giving it some ranking among one's general priorities.	This is the level at which a person would begin to make long-range commitments to arranging his or her instruction and assessment relative to the model.	Adheres, alters, arranges, combines, compares, defines, explains, identifies, modifies, orders, prepares, relates, synthesises.
Characterisation by value	The individual has a value system that has controlled his or her behaviour for a sufficiently long time for him or her to have developed a "life style"	At this highest level, a person would be firmly committed to utilising the model to develop, select or arrange instruction and would become known for that action.	Acts, displays, influences, solves, practises.

[Adapted from Huit (2001) and Little (1998)]

The column on the left represents the level or category of the affective commitment. Receiving is considered the lowest level and characterisation is the highest level. The second column shows the illustration action for each level, the third column provides examples of cases, and the last column provides examples of action verbs that could assist in categorising the stories of the educators in terms of the affective domain.

2.2.3 Malone's motivation theory

In his early research on motivation, Malone (1981) suggests three relevant factors: challenge, curiosity and fantasy. In later work (Malone & Lepper, 1987) added learner control. These four factors will be discussed in the following paragraphs.

2.2.3.1 Challenge

The most important principle is that the level of challenge should be individualised for and adjusted to the learner. A lesson should not be too easy but neither too difficult. Setting challenging goals at the start of the lesson are beneficial. Having uncertain outcomes, wherein the learner is not sure if they are attainable, increases challenge. Varying the difficulty of the material as learner performance improves maintains challenge throughout the lesson (Malone, 1981).

2.2.3.2 Curiosity

Malone (1981) differentiates between sensory curiosity and cognitive curiosity. Visual effects that attract attention arouse sensory curiosity. Cognitive curiosity is aroused by information that conflicts with the learners' existing knowledge or expectation. These situations encourage the learner to seek new information that remedies the conflict.

2.2.3.3 Control

There are three rules that are relevant for learner control; these are contingency, choice and power. According to the contingency rule, what the lesson does should be clearly the result of the learner's actions and responses. Lessons that give feedback as a function of specific responses or which follow different paths through the content based on learner performance follow the contingency rule. The notion of power is that lessons in which the learner's actions have powerful effects will be very motivating (Malone & Lepper, 1987).

2.2.3.4 Fantasy

Fantasy situations encourage learners to imagine themselves in imaginary contexts or events using vivid realistic images. In any lesson it may be valuable to encourage learners to envisage themselves in a situation where they can really use the information they are learning (Malone, 1981).

2.3 Emotional and affective factors

Motivation refers to a person's willingness to learn (Lumsden, 1994). Intrinsic motivation is the motivation to do a task where the reward for doing the tasks lies in the satisfaction of doing the task, while external or extrinsic motivation is based on having a reward outside the

task (such as marks). The same applies to educators integrating ICT in the curriculum wherein they will receive some certification on introducing ICT regardless of the challenges they are experiencing. Motivation is the key to performance improvement; without motivation, people tend to lose interest in whatever technological innovations which may be in place. Therefore, if teachers are motivated to perform certain tasks, their performance will increase. Without motivation, there is no performance.

Maslow (1970) realised that an environmental precondition of stimulation, or challenge, was needed to motivate individuals. Therefore, it is also the teachers' responsibility to include a means of stimulation in their teaching programmes to catch students' interest (Goble, 1970).

Mwamwenda (1996) points out that possessing intrinsic motivation is more desirable than possessing extrinsic motivation. Table 2.2 shows the factors of intrinsic motivation as derived form Malone (1981). It also shows other motivational factors (Kearsly, 1998). Smith (1998) suggests that the reason for looking for motivated educators is nothing else but survival. Motivated employees are needed in our rapidly changing workplaces; motivated employees help organisations survive; motivated employees are more productive. To be effective, managers need to understand what motivates employees within the context of the roles they perform. Of all the functions a manager performs, motivating employees is arguably the most complex.

Table 2.2: Factors of intrinsic motivation (Malone 1981 & Kearsly, 1998)

Factors of intrinsic motivation	Component(s) of the intrinsic motivation factor
Challenge	Range of challenges
	Flexibility
	Personally meaningful goals
	Feedback
	Set criteria for performance
Curiosity	Complexity
	Incongruity
Fantasy	Fantasy
Choices	Choice
Relevance	Relevance

Even if the task has been designed specifically to be intrinsically motivational, Ginsberg and Wlodkowski (2000) point out that there are four other conditions that are also prerequisites for intrinsic motivation:

- A feeling of mutual respect and connectedness between the teacher and the learners
- A positive attitude towards learning
- Learning that has social merit and personal importance to the learner
- A feeling on the part of learners that they are effectively learning something that is of value to them.

McCombs and Whisler (1997) note that positive attitudes and self-esteem also influence the motivation to learn. Malone (1981) states that when learners feel that they are up to the challenge of the task, it will enhance their motivation to perform a task. But when learners feel that they will fail in their performance of the task, their motivation is diminished.

2.4 The school

All organisations or social groupings such as schools, education systems and cultural associations have two types of task to perform. The primary and the functional task of an organization is its actual task through which particular needs of the community have to be realised. The second is the managerial task that states that in order to understand the school, one should understand the basic tenets on which the school is founded (Badenhorst, 1991).

Educative teaching, the functional task of the school, takes place when an educator, a learner and the teaching matter are brought together in order to achieve an educational objective within a teaching-learning situation. The entire education system is directed towards enabling the school with its board of management, where applicable, to allow the functional activities to take place. All these networks of organisations have their particular functions and mutual relationships, and the education system is structured in a holistic manner. The following principles of education are mentioned:

- Education should in the first place be directed at providing as complete education as is possible to the learner, i.e. all possibilities and qualities of the child should be developed and formed as fully and comprehensively as possible. This is the first principle involved. Therefore, intellectual/cognitive education should receive the same measure of attention as the emotional/psychological education. None of these aspects should be emphasised at the expense of any of the others

- A second principle involved is that the learner's education should be balanced. An educator or a school may well give attention to developing all of a child's possibilities, but then emphasise one type of education only. According to the principle advocated here, all types of education should be regarded as being equally important so that the child eventually will be able to take his place in the community as a balanced person
- The third principle involved is that education and schooling should be differentiated, i.e. in addition to the demands of total and balanced education, schooling should be directed at the unique personal qualities of the child/learner that are related to aptitude, interest, culture and physical abilities
- The fourth principle involved is that the learner's education should be value-oriented. Education cannot be neutral or so-called objective because even in objectivity a certain value judgment is implied
- The fifth principle that is of paramount importance is that the learner's education must be relevant and be on par with the demands of technology. By relevance, I mean that the type of education must prepare and equip the learner with appropriate knowledge and skills for his specific situation and time (Badenhorst, 1991).

According to Hepp (2002); Hinostroza (2002) and Laval (2002) each school has unique features in terms of the way it is organised, the decision-making process and its own educational priorities. Similarly, each educator has a particular teaching style, her way of dealing with learners and relating to other educators, her way of using the available resources and of planning each class. Therefore, each school offers a different kind and degree of acceptance of innovations such as the use of ICT in the curriculum. The school is a good place for educators to learn how to integrate ICT in their praxis and to explore new ways of teaching. It is their workplace and an environment they share with students. Therefore, their own classroom might be the best place for training sessions, simulating a real setting with other educators playing learner roles or practicing with actual learners. The school should try in all its power to involve the principal, school management teams, school governing bodies and support staff as well as educators by doing the following:

- Allocating resources carefully
- Eliminating technical obstacles with technical staffing and enough financial planning
- Practicing what it preaches with regard to the learning theory, i.e. training the staff in the methods and theory being used in the classroom
- Providing time for joint decision-making and planning
- Providing adequate resources for the desired outcomes

- Making technology and computers part of their overall planning to increase student learning
- Selecting software with broad usage
- Sharing the vision and goals of computer-assisted education (Hepp, 2001).

The school is a collection of many stakeholders. It is important that all matters relating to how educators are experiencing the integration of new methodologies should not be taken for granted, but should be given a serious attention because teachers portray different types of emotions to different types of situations.

2.5 The staff

According to Carl (1995) the staff should be able to do certain practice that enables the school to run effectively. Among those practices, the staff should do the following:

- Practise using computers even out of class
- Be encouraged to share enthusiasm and celebrate initiative
- Become to use the computer as the facilitator
- Be given time in school for training and research
- Be involved and play an active role from the design and planning stage to the evaluation stage and be provided with access to program-expertise when necessary
- Be financially assisted to purchase their own computers to use at home (Anderson & Perry, 1996; Carl, 1995).

For staff-wide integration to take place, more attention must be given to the people-ware (teachers in this instance) than to the hardware and software because they are primarily expected to carry out the change, therefore their needs and experiences should be provided for.

2.6 The community

Palloff and Pratt (1999) assert that to be successful in ICT integration, a sense of community needs to be developed among the group of participants. If support and participation are not forthcoming from the course members in an ICT course, there is no learning community and consequently no ICT support (Palloff & Pratt). Berge (1995) describes a virtual learning community as a "group of learners which is networked with other learners, 'knowledge media', and a facilitator all working towards the common purpose of acquiring knowledge

through interdependent pursuits" (Berge, 1999). According to Miller (1997) the private sector can support the schools by doing the following:

- Communicating success and problems encountered by the school
- Offering sessions using the school's facilities on current market applications (Carter, 1996).

To be able to do well, teachers need easy and quick access to current, accurate information. An efficient and reliable information resource can do much to support teachers in their quest for teaching ideas, information on the new curriculum and the way forward in experiencing such dimensions. If teachers know how, why, where and when to retrieve information and use it, their skills will not only enhance their teaching but will filter through to the community and their experiences will be reflected in an optimistic way (Oosthuizen, 1997: 233).

2.7 The role of curriculum coordination

Cashman *et al.* (2004) defines education as "all the experiences a learner has under the supervision and guidance of teachers which consists of a plan or written document that includes a series of required learning outcomes" (Cashman *et al.* 2004: 602). The Department of Education (1997) defines curriculum as the centre of any education or training system. Curriculum is therefore the National Department of Education's way of bringing on par and transforming education and training in South Africa. The government's goal with the new curriculum which has to integrate ICT is outlined as follows: "A prosperous, truly united, democratic and internationally competitive country with literate, creative and critical citizens leading productive, self-fulfilling lives in a country free of violence, discrimination and prejudice" (Department of Education, 1997:1).

Posner and Rudnitsky (1982) define curriculum as "an organized set of intended learning outcomes presumed to lead to the achievement of educational goals," and curriculum development as "the process by which intended learning outcomes are selected and organized" (Posner & Rudnitsky, 1982: 177).

In today's curriculum the focus is no longer based on the product, which is the learner, but on outcomes. This paramount change in curriculum is the move away from a product-based to an outcomes-based education system. The Department of Education: Policy Document (October 1997) states the educational focus of Curriculum 2005 as follows:

- integration
- holistic development

- learner-centred approach
- progression
- quality, standards and international recognition
- relevance
- taking part and ownership
- flexibility
- anti-prejudice approach
- responsibility and transparency
- critical and creative thinking
- the inclusion of learners with special needs (Department of Education, 1997).

ICT has the potential to increase teachers' motivation; therefore the key to successful technology integration is to identify what one is trying to accomplish within one's curriculum.

2.7.1 The role of the teacher in e-Education

In a constructivist-learning environment, the role of the teacher is to facilitate and guide learning. In this approach, learners are now doing a lot of teaching to one another and the role of the educator is that of facilitation. This is indeed a different style of learning because learners are now responsible for their own learning. Although this is a different type of learning, this changed role has presented difficulties for teachers in the sense that in the old traditional, discipline-based approach, teachers prepared the lessons to teach the pre-determined concepts but in the new approach, lesson preparation has changed significantly. Teachers no longer do a typical lesson plan but the learners tell the teachers what they need to know and as a result, a different set of plans must be in place for the learners. The new approach dictates that there has to be a provision for cognitive support by making suggestions, encouraging the learners to think independently and by challenging their creativity. There is also assessment of the learners on a continuous basis (Briner, 1999).

2.7.2 The use of computers in the primary school

In any society teachers have the ability to make an enormous positive contribution. Making such a positive contribution is a challenge and teachers must willingly embrace new teaching and learning opportunities. Teachers are beginning to recognise that they must teach future leaders and citizens of society the technologies that will be a major part of their future. It is evident that teachers of Success Primary are already doing their bit towards this educational change (Biswas, 1994).

An extensive body of education research is showing that technology can support learning in many ways. Using information and communications technology in the classroom, for example, can be motivational. Computer-related technologies could capture students' attention. Computers also provide many unique, effective and powerful opportunities for teaching and learning. These opportunities include skill-building, proactive, real-world problem-solving, interactive learning, discovery learning and linking learners to instructional resources (Garbers et al, 1988).

Biswas (1994: 132) states that "computers also support communications beyond classroom walls, thus enabling schools and communities to provide an environment for cooperative learning, for the development of high order thinking skills and for solving complex problems".

2.7.3 A cultural view to ICT integration

It is stated that in recent years, the focus of ICT integration in educational settings has been grounded on theoretical underpinnings, such as socio-cultural perspective and activity theory (Bruner, 1996; Wertsch, 1998). Fundamentally, these notions stress the tight inter-relations between the individual experience and the environment. Culture is the implicit and explicit social and cultural dimension of values and core beliefs that a school practises and adheres to. Simply understood, it is the way we live our lives in the schools. A school's culture is a critical factor in the success or failure of ICT integration into the curriculum. According to Wertsch (1998) culture deeply influences personal behaviours. Cultural contexts include both physical and created practices of varying communities where activity is mediated by cultural tools. In an attempt to integrate ICT in the curriculum, three dimensions for ICT are mentioned: teacher belief, classroom dynamics and school structure. Lundall and Howell (2000) assert that teachers with a positive attitude towards information and communication technologies appreciate the intrinsic value of culture for themselves, see the use of computers as vehicles for learner empowerment, acknowledge the opportunities for independent thinking and value the sources of strategic information, which they can download from the Internet.

2.7.4 The role of technology integration

Cashman *et al.* (2004) define technology integration as a combination of all technology parts, such as hardware and software, together with each subject related area curriculum to enhance learning and teaching. They further explain that technology integration is when

technology is used to help meet the curriculum standards and learner outcomes of each lesson, unit or activity. The mastery of technology is not an easy thing to do but extensive formal training and practical experiences are imperative for successful integration of technology at all levels of learning.

According to Miller (1997) the integration of ICT in primary schools implies shifting from traditional teaching to a different approach to instruction and learning. There must be an agreement of all stakeholders in terms of the following factors:

- Meeting new demands of society in student skills
- Aims of general primary education
- Updating the curriculum to incorporate innovations
- Training teachers in new skills and equity of access for all learners
- Stabilising the funding policies and support by technical staff
- Development and the provision of complementary material (Miller, 1997).

It is evident that for technology to be integrated in the curriculum, all stakeholders have to be involved. The input of technology can also yield negative results when not properly implemented.

2.7.5 Dimensions of ICT integrations in relation to traditional and constructivist approaches

The first dimension is concerned with the individual experience and belief, which strongly influence classroom behaviour and the propensity to change classroom behaviour. If the design of the school structure and reward system influences the behaviour and belief of teachers, then a traditional systematic structure would influence teachers to value teaching as the transmission of information. Teachers that are rewarded reinforce these experiences and beliefs. The second dimension is that of classroom dynamics which include the practices of implementation during the curriculum structure. For example, if a school were to be rooted in its beliefs in traditional models of teaching, then the pedagogies practised would be translated as didactic strategies of delivery. The third dimension is that of school structure which considers the school's culture, workflow processes which are in place and the design of the curriculum structure. The manner in which the school is structured has a direct bearing on how teachers experience their teaching. If the school structure is not conducive to teaching, indeed the teachers will experience their teaching in negative way. Similarly, ICT cannot be integrated effectively when there are no support systems and consideration of effort taken by teachers.

2.7.6 Keys to effective ICT educators' training programmes

A number of factors are seen to be critical to for ICT teacher training programmes to be effective. These are:

- Incentives and support for teacher training
- Teacher-directed training
- Adequate access to technology
- Community partnerships
- On-going informal support and training opportunities.

The objective of a specific training activity will determine how ICT should be integrated into the training processes and the manner in which these training sessions affect the experiences of the educators.

2.7.7 Special ICT competencies for educators

The initial teacher-training curriculum implies the desired ICT competencies for teachers, which could be the following:

- Positive attitude toward ICT
- Understanding of the educational potential of ICT
- Ability to use ICT effectively in the curriculum
- Ability to manage ICT in the classroom
- Ability to evaluate ICT use
- Ability to ensure differentiation and progression
- Technical capability (Ministerial Advisory Council on the Quality of Teaching, n.d).

A certain level of ICT expertise is required for teachers to utilise information searches for professional purposes (Becker, 1999). Positive attitudes, guidelines for ICT use and technical support are amongst the factors that contribute towards high levels of ICT adoption and integration by teachers.

2.7.8 An implication for ICT educator training

Beyond the specifics of content for an ICT teacher training curriculum, there is a sense that there is so much that an educator has to learn to become competent in the use of ICT for teaching tasks. There is also the prospect of having to keep up with developments in technology. ICT educator training should therefore be considered as a continuing process,

with the need for continuing support. The initial training may take place as part of pre-service training or it could be part of in-service training. Wherever it may take place, the training should be regarded as a process that must continue even after the formal course has been completed. This would mean making resources available that will enable the teacher to pursue self-directed learning (Jackson, Bartle and Walton, 1999). There are however, barriers to the effective use of ICT and the success of this teaching practice depends upon the following changes:

- The school organisation
- Cost of technology
- Lack of skills and training
- Methods of teaching and technical support
- Attitudes of the teachers towards their work
- Ever-changing new skills needed (Jackson *et al.,*1999)

2.8 Staff development

In terms of staff development, I will point out what others say that I can use in the ICT implementation at my school. Rebore (1987) states that, “No employee will remain qualified in the face of accelerating change without some form of ongoing education and training” (Rebore, 1987, p. 172).

“Efforts to replace educators with technology have uniformly failed. Inventions intended to take over teaching come and mostly go. Cognisance should be taken that what happens in classrooms looks pretty much the same because technology enthusiasts continue to forget a basic fact that machines are tools, valuable only when a human intelligence organizes their use in a productive way. In the classroom, that human is the educator, who controls the nature of the environment and what happens there, good classroom tools extend the educator’s power to create a rich learning environment. If the educator does not know what to make of the tool, fears it, or misconstrues its uses, it will be used badly or not at all. If the educator perceives the machine as a master, not as a servant, its potential will never be realized’’ (Burbules & Callister, 2000, p. 26).

‘’Professional development is a relatively new term’’ (Hoyle, 1985, p. 27). It is often seen as merely as the synonym for in-service training, but it appears as if the concept has a dual connotation:

- It is a process starting with initial training, followed by exposure to practice, and lasting during the whole career, during which the educator seriously attempt to attain

and develop additional knowledge and skills which are needed for effective professional practice as circumstances changes and new responsibilities are accepted

- Knowledge and skills should be more related to the substantive problems of the present day than to those of the past (Hoyle, 1985).

2.9 Educators' skills, beliefs and attitudes

I have learned that educators work under a given social and cultural context that is a key influence in the way they perceive and use ICT for their personal and professional practices. In addition to the social and cultural context, teachers' perception of ICT in education is also influenced by their own experience and opportunities to use ICT for personal or professional reasons. In my experience it is necessary that educators understand and discuss the stages involved in their own process of becoming proficient in the variety of uses of these technologies. Besides technical skills, training in Success Primary also considers a number of other factors that might affect an educator's decision to use ICT in the classroom. These factors can be grouped into the following two levels of barriers:

- Educator beliefs mediate their planning and classroom practices, in particular the belief about their level of ability to use ICT in classrooms
- Self-efficacy, the belief about one's capability to perform actions at a given level, is based on the level of skill possessed and on judgments about what can be done with current skills.

Without skill, performance is not possible, without self-efficacy performance may not be attempted. A broad but useful generalisation about teacher's attitudes towards ICT is that of considering three basic categories of teachers: innovators, resistors and mainstream. Rogers' (1962) identifies different stages (individual or group) of the innovation diffusion. These stages are tabulated in Table 2.3. According to Rogers' model the Theory of Innovation Diffusion states that there will be an increased rate of diffusion in ICT integration if potential adopters perceive the innovation:

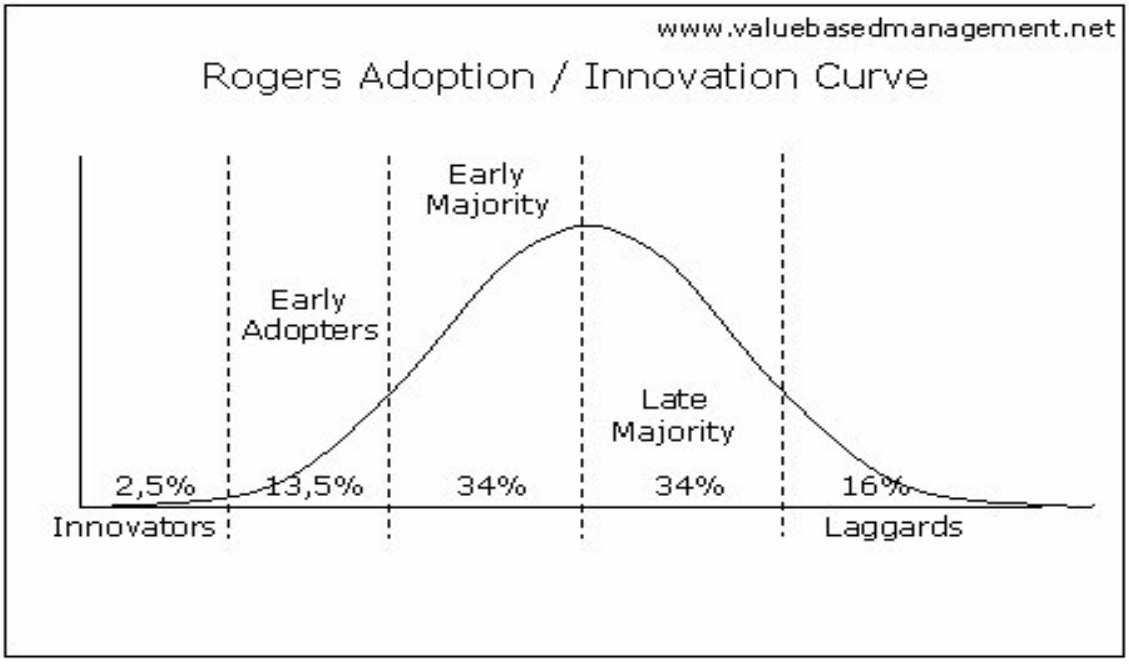
- to have a relative advantage, that is, the degree to which it is perceived to be better than what it replaces
- is compatible with existing values, past experiences and needs
- it is not overly complex and easy to understand and use
- offers visible results

Table 2.3: Stages of Diffusion of Innovation

Stage	Description
1. Knowledge	**Exposure to the existence of the innovation and understanding of its functions.**
2. Persuasion	**Forming of a favourable attitude towards the innovation.**
3. Decision	**Commitment to the adoption of the new innovation.**
4. Implementation	**Putting the innovation to use.**
5. Confirmation	**Reinforcement based on positive outcomes from using the innovation.**

According to Robinson (2002), there is a relationship of each segment of the population with certain teacher tasks and roles. With regard to innovative teachers, they lead the way for others and are also testing grounds for innovations. The ideological approach of these teachers often frightens people but they are the ones who have already personally adopted new behaviour. The innovators recruit and train other peer teachers. With regard to the early adopters, they create new opportunities for experimentations and offer support for other teachers. The early majority guarantee performance and also offer support for the novice teachers. The late majority refine the programs and satisfy needs of other teachers. The laggards are traditional teachers who prefers caring for old ways and are critical towards new ideas and will only accept it if the new idea has become mainstream. The explanation of Table 2.3 is further emphasised in Figure 2.3.

Figure 2.3: Rogers' Adoption Curve



Many discussions inside Success use these categories when reviewing training results and considering possible modifications. Innovators will rapidly recognise the potential of ICT in education, will be willing to explore its uses with their students and in their professional duties (i.e. management) in the early stages of the training process. They will also be willing to become responsible for administrative and technical tasks related to the equipment (i.e. running the technology laboratory). Innovators are normally the ones who volunteer for the first training courses and participate in the first stages of the ICT program. The school's ICT coordinator will normally be a volunteer from this group. Working only with innovators at the beginning of an ICT Program can be very deceiving for policy-makers because the rest of the teachers in all schools do not necessarily share this group's active commitment. Success Primary learned during its evolution, which included an increasing number of mainstream educators, that progress with them is much more difficult to achieve. Policy-makers should be aware that although innovators can play a great role in having a working demo running at early stages, the expectancies created by them may not be fulfilled in the next up-scaling level, when less committed teachers become involved in the program (Rogers, 1962).

Many good educators are resistant to ICT with good and strong reasons that must be taken into account. Although many of them may never get actively involved in using computers in a laboratory (but may use a screen projector in their classroom) they will undoubtedly provide a healthy and necessary tension that will impose on policy-makers the need to use rigorous arguments in favour of ICT in schools; failures will provide good ammunition for these teachers Chalkley and Nicholas (1997).

Some of these teachers' arguments against using ICT in education are that these technologies represent a threat to their professional status because technologies will diminish their role (i.e. stories about software that might substitute them) will degrade their relationship with students and will take over initiative and control in the classroom to the detriment of teachers. Other teachers are simply not willing to make changes in their teaching praxis because they perceive it as adequate as it is; still others are simply afraid of using computers and similar technologies such as TV recorders, cameras and screen projectors ("technophobes"). However, a teacher might carry a resistant attitude mainly because of a low level of confidence in his or her abilities (Cox, 1999).

Success Primary encouraged its teachers to use ICT and tasks that provide early success (no matter how small) to increase confidence. The e-Education sets out progressively more complex, deeper and broader knowledge, skills and attitudes for teachers to acquire from one level to the other. Progression is a key feature of the revised curriculum. Integration

ensures that learners experience the learning areas as linked and related by making links within and across learning areas. Integration supports and expands educators' opportunities to develop skills, attitudes and values, and acquire knowledge across the curriculum. For curriculum integration to be effective, the curriculum should drive the technologies used in the classroom, i.e. teachers should use the applicable technologies to enhance teaching at appropriate times. Learning to integrate technology efficiently requires thorough planning and practice and this can only be conducted effectively if relevant theories are incorporated (Kearsley, 1998).

2.10 Conclusion

Integrating technology into teaching is a very powerful way to weave these learning theories throughout the curriculum. In this regard, theorists help teachers understand how to adapt instruction, information and the environment for different situations. Integrating learning theories and technology into teaching can make a difference in teachers' motivation. This chapter looked at the experiences of teachers by incorporating three models of teaching and learning. The following models were dealt with in detail: the Technology Acceptance Model, Krathwohl's Taxonomy of the affective domain, Rogers' Model and Malone's Theory of Motivation. Chapter 3 will describe the methodology used to investigate the experiences in integrating ICT at Success Primary School.

Chapter 3

Qualitative research are typically rich with detail and insights into participants' experiences of the world, may be epistemologically in harmony with the reader's and uses the natural setting as the source of data with theoretical sensitivity including professional literature, professional experiences, and personal experiences (Stake, 1978).

Chapter 3
Research Methodology

3.1 Introduction

In the previous chapter, the literature was investigated regarding the teachers' experiences relating to the integrating of ICT in the curriculum. This chapter provides an indication of how the data was collected and the research methods that were used for the study. The following aspects of the study are discussed in chapter 3.

The study explores teachers' experiences about the integration of ICT in the curriculum. The study attempts to answer the following critical question with regard to educators' experiences of ICT:

> What are the teachers' experiences in integrating ICT in the curriculum?

3.2 Research methodology

This study is conducted within a qualitative research framework because it addresses the direct concern with emotional experience as it is lived or felt. I want to follow the experiences as closely as possible as the participants perceived it or lived it. Several authors address the characteristics of qualitative research (Creswell, 2002; Merriam, 1998; Tesch, 1991). Denzin and Lincoln (2000) trace the complex history of qualitative research, offering an "initial, generic definition" against the backdrop of traditions and movements framing the landscape of this approach.

According to Strauss and Corbin (1990), a qualitative research is broadly defined as any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification. Qualitative research is therefore a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make the world visible. These practices transform the world. They turn the world into a series of representations, including stories, interviews and observations. Qualitative researchers study things in their natural settings, attempting to make sense of, or to interpret phenomena in terms of the meanings people bring to them. Thus a qualitative researcher should focus on a

natural setting. Qualitative research is sometimes called naturalistic inquiry as is postulated by Lincoln and Guba (1985).

A good qualitative study (Creswell, 2002) supports the definition provided above: The use of rigorous data collection methods; the use of a tradition of inquiry, (one of these being the focus group, the identification of a single problem or issue that the researcher wants to understand; writing persuasively so that the reader can experience 'being there'; using verification procedures to ensure the accuracy of the account; moving through various iterations or layers of understanding in analysis; and finally, engaging the reader as the story is told.

Within the broad expanse of qualitative research, there are several paradigms or frameworks that guide and structure the researcher's action. One of these, the interpretative paradigm, assumes the following (Denzin & Lincoln, 2003).

In qualitative research there is an existence of multiple realities that people have constructed. There is a co-creation of understanding between researcher and participant. In this research, the researcher integrated the use of methods and procedures that are available in a naturalistic or real-world setting. An emphasis on gathering and interpreting data from a subjective (researcher's) position is addressed. There is also an emphasis on the shaping of the research findings by the researcher's background, intentions and experiences and also the emphasis on credibility, transferability, dependability and conformability of the research findings (Denzin & Lincoln, 2003).

According to McMillan and Schumacher (1997) qualitative research aims to investigate behaviour as it occurs naturally in situations and there is no manipulation of experiences. Labuschagne (2003) defines qualitative research as mainly concerned with the properties, the state and the character (i.e. the nature) of phenomena.

I have selected a qualitative approach because it is designed to explore the lived experiences of educators in integrating ICT in their curriculum. The research focuses on experienced educators aged between 40 and 50 years old. I selected these educators as participants because they did not study computers during their schooling years, nor did they study it at college or university but they learnt it during their experiences of teaching. During those times, there were factors that inhibited the use of computers in their teaching years and among others the educators explained that there were not even teachers who were trained who could impart such knowledge and skills to them. Again there was a lack of

available ICT resources. There were also some inhibiting factors such as knowledge or skills and lack of support from higher authorities. A qualitative methodology was chosen as the most suitable approach for an in-depth exploration of the social context that surrounds experiences and associated behaviours. Qualitative approaches are therefore appropriate because of their emphasis on “context-embedded behaviour” (Gilbert, 2001). Qualitative researchers employ different means of "persuading" the reader that a study is trustworthy. This is what Firestone (l987) calls the "rhetoric" of this research. While "the quantitative study must convince the reader that procedures have been followed faithfully because very little concrete description of what anyone does is provided" qualitative research persuades through its "classical strengths" of "concrete depiction of detail, portrayal of process in an active mode, and attention to the perspectives of those studied" (Firestone, 1987).

My study is based on a social reality because the data content is described physically, socially, interpersonally and functionally. There is a physical description of people, the time and the place of events and there are interviews that assist in data analysis. There is also interaction of the researcher in dealing with issues of understanding because the researcher is physically there in the field.

3.3 Data collection

Three of the principal collection categories of qualitative research include participant observation, interviews and focus group (Dalton, Elias & Wandersman, 2001). Communication through telling stories is a natural human impulse (White, 1981). Through telling their stories, people can express their identity, relationships and emotions. Furthermore, they can order and orientate life events, in some cases gaining a sense of perspective upon these events, and can often solve problems (McLeod, 1996).

In order to get permission to conduct my interviews and observations, I approached the governing body of the school together with the members of staff to conduct the research. Permission was granted but there were conditions that applied. One of the conditions was to conduct my interviews after school. For the narrative stories, a meeting was held with the participants and they were informed about the dates to submit their written stories. All members acceded to the request and the stories were submitted on time. I personally collected them in a meeting that I had arranged. Bruner (1986) claims that narrative knowledge (that is, knowledge derived from stories) is as essential as paradigmatic knowledge (knowledge gained from science) in enabling people to make sense of the world.

According to Morse (1994) the term "qualitative research" encompasses a wide range of philosophical positions, methodological strategies and analytical procedures. Morse has further summarised the cognitive processes involved in qualitative research in a way that can help us to better understand how the researcher's cognitive processes interact with qualitative data to bring about findings and generate new knowledge. Morse believes that all qualitative analysis, regardless of the specific approach, involves:

- *comprehending* the phenomenon under study
- synthesising a portrait of phenomenon that accounts for relations and linkages within its aspects
- *theorising* about how and why these relations appear as they do
- *recontextualising*, or putting the new knowledge about phenomena and relations back into the context of how others have articulated the evolving knowledge.

I used narrative stories, interviews and observation to collect the required data. The following aspects are discussed in the paragraphs that follow.

3.3.1 Data collection techniques

I have adopted the following data collection techniques.

3.3.1.1 Narrative stories

Educators were requested to write narrative stories about their lived experiences of integrating ICT in their curriculum. There is a variation of narrative structures and representations in terms of the mode of qualitative inquiry. Their written narrative stories were contextualised and coded. Topics were coded and categorised. Categorisation was done according to segments of the topics, coding categories for meaning and generating predetermined categories (McMillan & Schumacher, 2001) (Addendum C1).

Narrative research focuses on exploring the meaning of individuals' experiences as told through their stories (Creswell, 2002). He further states that for individuals searching for a research design that reports personal stories, narrative research may be ideal, as it seeks to understand and represent experiences through the stories that individuals live and tell. In line with Creswell's perspective on narrative research, one has to point out that qualitative researchers have discovered the extent to which human experience is shaped, transformed and understood through linguistic representation. The vague and subjective sensations that characterise cognitively unstructured life experiences take on meaning and order when we try

to articulate them in communication. Putting experience into words, whether we do this verbally, in writing or in thought, transforms the actual experience into a communicable representation of it. Thus, story forms are not the experiences themselves but a socially and culturally constructed device for creating shared understandings about them. Narrative analysis is a strategy that recognises the extent to which the stories we tell provide insights about our lived experiences (Creswell, 2002).

Muller (1999) shares the same ideology when she explains that a narrative approach is firmly grounded in qualitative traditions and stresses the "lived experiences" of individuals. Through constant analysis of lived experiences, some qualitative methods are not oriented toward finding patterns and commonalities within human experience, but instead seek to discover some of the underlying structure or essence of that experience through the intensive study of individual cases. The following are stated as the dimensions of the narrative approach:

- A narrative approach assumes that people like to tell stories, that they organise their significant experiences in terms of the stories and that the telling of stories is a way, perhaps the most basic way, for humans to make sense of events in their lives
- Narrative has structural properties of time and plot
- Narrative has the power to shape human conduct as well as to reflect an individual's life experience
- Narratives have a contextual focus
- Narratives are relational (Muller, 1999).

Meta-cognition is the process of thinking and understanding a person's own cognitive processes (Flavell, in the Open Learning Technology Corporation, 1996: Learning Concepts). It is the active monitoring and control of the cognitive processes, and is central to planning, problem solving and evaluation (Open Learning Technology Corporation, 1996).

This research study and its conceptual framework are viewed within the paradigmatic boundaries of the constructivist and interprevist paradigm. Teachers who are implementing ICT in the curriculum are really working hard to try to instill in the learners and other educators the importance of following a digital dimension. Although it is not easy to work within this type of technological environment, the educators are trying their bit to make others accept that the digital way is the way to go. In my literature survey, I tried to search for literature that is appropriate to my study and found the models that follow to be of paramount importance.

3.3.1.2 Focus group interview

I chose the focus group as a method of collecting data because it represents a sound method of inquiry with much potential for the study of teachers of ICT. All educators participating in the research were interviewed in the focus group. Krueger (1988) states that focus groups are an important technique because they offer a way for researchers to listen to the plural voices of others and are also important for making audible the voices of people who want to be heard. The process was executed in the following manner: I conducted an interview wherein the participants gave their responses. For my focus group, I developed a structured interview guide with some introductory remarks. I first asked a very general question dealing with participants' opinions about the importance of being computer literate. Only after framing the topic did I begin to ask more specific questions about the real issues of incorporating ICT in the curriculum. Because of this first general question, the participants moved away from the topic, tapping into areas of the topic that I had not previously considered. The aspects that follow were addressed as far as integration of ICT is concerned (Addendum B: 1).

I arranged an interview with a small number of persons who have some characteristics such as race/ethnicity, gender, age, health condition, etc. in common. The purpose was to assess the similarities and the differences among people in the focus group in how they respond to ideas and topics posed during the interview as well as to one another. A focus group consists of a moderator who guides the interview from one topic or question to another, follows up on interesting lines of thought or points out necessary clarification, moves the conversation from generalities to specifics, and makes sure everyone is heard. The participants who share the common characteristics but who do not know one another well or not at all were all taken on board (Dalton *et al.*, 2001). A semi-structured interview protocol was used in the study.

The data collection took place at Success Primary School in July 2005. The interviews improved the condition of respondents when they were asked to review their successes or stimulated them. When I arrived at the school to conduct the interview, the teachers were kind enough and gave me all the necessary support I needed. I did not experience any difficulty. Some of the problems that I anticipated during interviews were minimised because of the rapport that I had built during the observation sessions between the subjects and myself.

The data consists of discussions and of the responses of the group to the question or topics, the interactions generated among the participants themselves, and the observations made

by the moderator. While I focused on the outline or tentative list of questions and topics, participants were allowed to interject and the moderator thought of new questions during the course of the interview (Dalton *et al.*, 2001).

After the discussions, I thanked the participants and requested them to make comments and their impressions about the interview. The participants were all co-operative and happy to have been part of the whole process.

3.3.1.3 Observations

Five educators were observed. These included three members from management and two from post level one. Teachers were observed in the ICT class while conducting lessons. A digital camera was used to capture the deliberations. I used a structured observation because I had planned categories to observe in advance. The codes I used were understood by the participants and as a result, the entry levels were smoothly dealt with. The observation was only done in an ICT class and the duration was two periods per educator. The foci of the observation were five teachers teaching ICT. Data was collected through observing the participants in class and the outcomes of the observation were coded using contextual analysis and then summarised (Addendum B:2).The analysis of the data was rapid because the categories for analysis were built into the schedule. The observed behaviours were entered into the same categories. I used the rating scale to make judgements of the observed events in the classroom and a five point scale was used to enter the ratings (Cohen, Manion & Morrison, 2000: 309).

3.4 Data analysis

I created an integrated data set to analyse data. I analysed data from the narratives provided by the participants in the study. I interpreted this data through the literature relevant to the study and through my own understanding of the educator's role from my own practice, using the participants' words from their narrative stories.

I used contextual analysis to evaluate the narrative stories, interviews and observation. The experiences, the challenges and the benefits of using ICT were coded for their frequency and relevance. In contextual analysis, narratives, and particularly the evaluative elements of narratives, are considered social phenomena (Labov & Waletzky, 1967). As a social phenomenon, narratives vary according to social context and evaluative data extracted from narratives will vary according to the social context within which they are collected.

Consequently, it may be fruitful to gather narratives on the same reference objects from otherwise similar respondents in varying social contexts. Likewise, gathering narratives on the same objects from the same respondents at different points in some development process will yield differences in evaluative components and consequently insight into the process.

Travers (1969) in Cohen, Manion and Morrison (2000) describes content analysis as a multipurpose research method developed specifically for investigating a broad spectrum of problems. Qualitative content analysis facilitates contextual meaning in text through the development of emergent themes (Bryman, 2001). Busch, et al. 1996, White and Palmquist (2005) state that content analysis establishes the existence and frequency of concepts represented in phrases. The steps in conducting conceptual analysis will be discussed in Table 3.1.

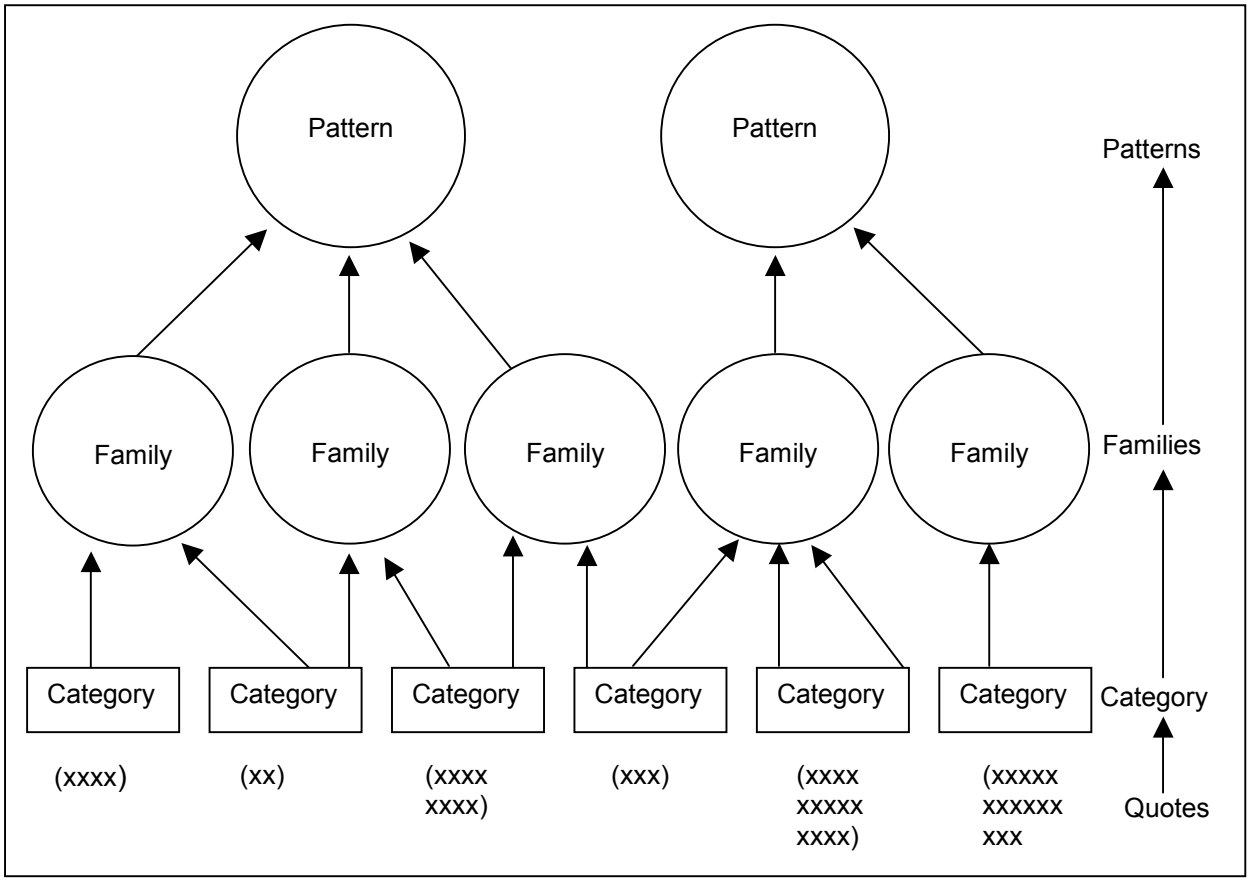
Table 3.1: Steps in conducting conceptual analysis (Busch et al., 2005)

Step	Description
1. Level of analysis	The researcher decides whether to code single words or sets of words during the data analysis
2. Number of codes	The researcher decides the number of concepts to code. Only relevant categories are added
3. Code for existence or frequency	When coding existence, the concept will be counted once and if counting for frequency, the number of times that the concept appears will be counted
4. Distinguishing concepts	The researcher should decide if the concepts are to be coded as they appear or should they be interpreted to mean the same word
5. Rules for coding text	The rules will help the researcher to have consistency and coherence in research
6. Irrelevant information	The researcher must decide about the information that has not been coded
7. Coding of text	The text can be coded by hand or computer, depending on the researchers' choice
8. Analysis of data	During this stage, the data which was coded and can be analysed to draw conclusions about the research topic

Codes are frequently abbreviations that enable the researcher to understand the issue being described and they suggest that coding labels should bear sufficient resemblance to original data so that the researcher can understand it (Miles & Huberman, 1994).

In order to code the categories, I firstly observed, interviewed and requested the participants to write narratives. There were transcripts that I received from the whole exercise. I read the transcripts and divided the sections according to meaning. I segmented the data into units of content, which I called topics. The ten topics that I segmented are achievement, challenge, contentment, empowerment, fiscal constraints, frustration, hope and ignorance, level of literacy and learner reflection. These topics are analysed in Chapter 4. I have adapted McMillan and Schumacher's (McMillan and Schumacher, 2001) picture of how to categorise data into meanings. The topics were then grouped into clusters to form four categories. The categories were then concatenated into two patterns. The topics of meaning will be outlined in Figure 3.1.

Figure 3.1: Development of an organising system from data



3.5 Writing and disseminating the research

During the dissemination of findings from the study, I made sure that simple language was used, and I did not use language or words that were biased against the teachers who were involved in the study. This is true for the research report on the real findings, as fraudulent practices are not accepted in professional research communities (Creswell, 2003). Finally,

written interpretations and reports will be made available to the head of school on behalf of the educators as a token of gratitude for their participation and contributions.

3.6 Ethical issues

Researchers need to reflect attitudes of compassion, respect, gratitude and common sense without being too effusive. I am aware that subjects have a right to expect that the researcher with whom they are interacting have some concern for the welfare of participants. Furthermore, the subject's sensibilities need also to be taken into account when the researcher comes to write up the research (Cohen *et al.*, 2000).

Analysis of the data collected may present other ethical problems. Since the researcher is the primary instrument for data collection, data will be filtered through her particular theoretical position and biases, and sometimes these biases are not readily apparent to the researcher. But the data to be analysed is that which is important to answer the research problem. Accuracy, wherever possible, will be an important criterion. Where possible, anonymity of the individuals who participated in the study will be of priority. Aliases or pseudonyms for individuals and places will be used to protect their identities. During the interpretation of the data, the accuracy will be checked against different data sources. The participants of the study will be involved in the validation of the interpreted data (Cohen *et al.*, 2000).

Most authors who discuss qualitative research approach address the importance of ethical considerations (Locke, Shaw, Saari & Lathan, 1982; Marshall & Rossman, 1989; Merriam, 1988; Spradley, 1980). For example, the ethical considerations of the qualitative studies include confidentiality, informed consent, relationship, invasion of privacy and sensitive issues, for example difficulty in disguising the identity of the organization or individuals that were studied when reporting the study (Gall, Borg & Gall, 1996). In psychology and sociology, ethical codes deal with weighing the costs and benefits of an investigation, which safeguards the rights of participants, and with ethical considerations in the presentation of research findings (Diener & Crandall, 1978 as cited in Merriam, 1988). My research is conducted according to the parameters of research ethics and as a result I am sensitive to the ethical principles and I have devised roles that elicit cooperation, trust, openness and acceptance. I am also aware that I have to assume a helping role and dress in a certain manner. Marshall & Rossman (1989) clearly state that researchers should devise ways within the constraints of the research and personal ethics to reciprocate in giving time, feedback and attention to the participants.

3.6.1 Privacy

In the context of the research, the right to privacy may easily be violated during the course of an investigation or denied after it has been completed. At either point, the participant is vulnerable. As a researcher, I am aware that privacy is being considered from three perspectives as cited by Diener and Grandall (1978). These levels are: sensitivity of the information being given, the setting being observed and dissemination of information. Sensitivity as explained by Cohen *et al*. (2000) refers to how personal or potentially threatening the information is that is being collected by the researcher. Certain kinds of information are more personal than others and may be more threatening.

3.6.2 Anonymity

Frankfort-Nachmias and Nachmias (1992) mention that the obligation to protect the anonymity of research participants and to keep research data confidential is an all inclusive endeavour.The essence of anonymity is that information provided by the participants should in no way reveal their identity. A participant or subject is considered anonymous when the researcher or another person cannot identify the participant or subject from the information provided (Frankfort-Nachmias & Nachmias, 1992).

3.6.3 Participants' participation

The sum of potential benefits to the participant and the importance of the knowledge gained should outweigh the risk of harm to the participant and thus support a decision to carry out the research. Qualitative interviews on sensitive topics may provoke powerful emotional responses from a participant. An appropriate referral source for professional help should be ready, should referral be necessary. Such referral may include authorities responsible for responding to illegal conduct. Ideally there should be reciprocity in what participants give and what they receive from participation in a research project. The investigator is indebted to participants for sharing their experiences. Reciprocity may entail giving time to help out, providing informal feedback, making coffee, tutoring or being a good listener. The reciprocity should fit within the constraints of research and personal ethics, and within the framework of maintaining one's role as investigator. Participants must receive feedback on research results, because this is a form of recognition and gratitude to participants for their participation.

In this study, the right to participate in the study will be taken into consideration, because the educators to be involved in the study are adults aged between 40 and 50. The head of school and the adults themselves will sign letters of consent. These letters will include the right to participate voluntarily, purpose of the study, procedures to be employed, and acknowledgement of participant's participation in the study, the right to obtain a copy of the results, and the right to be protected during data collection process (Addendum A3).

3.7 Trustworthiness

The basic question addressed by the notion of trustworthiness, according to Lincoln and Guba (1985) is simple: "How can an inquirer persuade his or her audiences that the research findings of an inquiry are worth paying attention to" (Lincoln and Guba,1985, p. 290). In the trustworthiness of qualitative research, there is a key issue which is developing a shared understanding of appropriate procedures for assessing credibility or trustworthiness ("validity"). In a broad sense, trustworthy qualitative research, like quantitative research, needs to be based on systematic collection of data, using "acceptable" research procedures and allowing the procedures and findings to be open to systematic critical analysis from others. In trustworthiness of qualitative data as in quantitative studies, issues of reliability and validity of the study are encountered in a qualitative approach. When judging qualitative work, Strauss and Corbin (1990) believe that the "usual canons of 'good science' … require redefinition in order to fit the realities of qualitative research" (p. 250). Lincoln and Guba (1985) have identified one alternative set of criteria that correspond to those typically employed to judge quantitative work (see Table 3.2).

Table 3.2: Comparison of criteria for judging the quality of quantitative versus qualitative research

Conventional terms	Naturalistic terms
Internal validity	Credibility
External validity	Transferability
Reliability	Dependability
Objectivity	Confirmability

Lincoln and Guba (1985) outline the credibility or internal validity as how truthful particular findings are. Transferability or external validity refers to how applicable or generalisable the research findings are to another setting or group. Dependability or reliability refers to how we

can be sure that our findings are consistent and reproducible. Having a thick description of the research process and how the investigator reaches the conclusions can greatly help another researcher replicate the study and arrive at the same general scheme. Trustworthiness relates to how we determine if “we got it right”. Guba and Lincoln (1981) propose four criteria for evaluating qualitative findings and enhancing trustworthiness. While each criterion has an analogous quantitative criterion, the list is believed to better reflect the assumptions and epistemology underlying qualitative research. These criteria can be both incorporated into a research design and be used to assess qualitative findings.

1. Credibility. This criterion is an assessment of the believability or credibility of the research findings from the perspective of the members or study participants. The inclusion of members checking into the findings, that is, gaining feedback on results from the participants, is one method of increasing credibility. Credibility is analogous to internal validity that is, the approximate truth about casual relationships, or the impact of one variable on another (Guba & Lincoln, 1981).

2. Transferability. This refers to the degree to where findings can be transferred or generalised to other settings, contexts or populations. A qualitative researcher can enhance transferability by detailing the research methods, contexts and assumptions underlying the study. Transferability is analogous to external validity, that is, the extent to which findings can be generalised (Guba & Lincoln, 1981).

3. Dependability. This pertains to the importance of the researcher accounting for or describing the changing contexts and circumstances that are fundamental to qualitative research. Altering the research design as new findings emerge during data collection may enhance dependability. Dependability is analogous to reliability, that is, the consistency of observing the same finding under similar circumstances (Guba and Lincoln, 1981).

4. Confirmability refers to the extent to which the research findings can be confirmed or corroborated by others. Strategies for enhancing confirmability include searching for negative cases that run contrary to most findings, and conducting a data audit to pinpoint potential areas of bias or distortion. Confirmability is analogous to objectivity, that is, the extent to which a researcher is aware of or accounts for individual subjectivity or bias (Guba & Lincoln, 1981).

3.8 Reliability

Kirk and Miller (1996) postulate that qualitative research is based on different assumptions about reality, a different worldview and a different paradigm, and these assumptions have ended in different conceptualisations of validity and reliability. In research it means that the researcher will get the same results every time he repeats the research.

3.9 Validity

I validated the data by triangulating the information received from the five participants in the focus group and also from the computer committee members who are in the school administrative and ICT department (McMillan & Schumacher, 2001).

Denzin (1978) states that, “Researchers use triangulation which is the cross validation among data sources, data collection strategies, time periods and the theoretical schemes. To find irregularities in the data, the researcher compares different sources, situations and methods to see whether the same pattern keeps recurring” (McMillan & Schumacher (2001: p. 478).

3.10 Conclusion

In order to provide a conceptual overview of the research process, this chapter described the research problem, research questions, and data collection methods and the data collection matrix. Chapter 4 will address the data analysis in detail.

Chapter 4

The extent to which emotional upsets can interfere with mental life is no news to teachers. Teachers who are anxious, angry, depressed, frustrated or uncertain do not learn; teachers who are caught in these states do not take information efficiently or deal with it well (Kort & Reilly, 2002).

Chapter 4
Data Analysis and Findings

4.1 Introduction

This chapter reports on the findings of the three data analysis strategies that were introduced in Chapter 3, namely interviews, narrative stories and observation.

Lauden, Traver and Lauden (1996) state the successful implementation and use of information communication technologies (ICTs) to enhance teaching and learning share some important prerequisites with enhancing information systems for schools. Increasingly, efforts are being made to integrate ICT into the curriculum and researchers are calling for the adoption of strategies that will make ICT integral to teaching and learning processes. A certain level of computer expertise is required for teachers to utilise ICT for professional purposes (Becker,1999).

To explore and analyse the experiences of the teachers, I outlined these experiences as they unfolded in the narrative stories, focus group interview and the results of the observation data set from the field. The analysis was driven by the following question:

> What are the teachers' emotional experiences in integrating ICT in the curriculum?

4.2 Participants' profiles

This study includes the evaluation of the five teachers. In this chapter I provide educator profiles in serial names to observe the principle of informed consent, i.e. that research participants must at all times be fully informed about the research process and purposes and must give consent for their participation in the research. I have also observed the principle of privacy, i.e. that the confidentiality and anonymity of human respondents should be protected at all times and the principle of trust, which implies that respondents will not be subjected to any acts of deception or betrayal in the research process or its published outcomes.
Dorothy is a computer guru at Success Primary school. She has been teaching for 25 years and during this time she has taught learners from Grade 4 to 6 in many different learning areas. These have included Mathematics, Economic and Management Sciences, Afrikaans

and Computer Studies, Arts & Culture Afrikaans and Movement Education. At the present time, she teaches Grade 5 learners Mathematics and Computer Studies. She studied ICT at tertiary level for two years as a part time student doing a Further Diploma in Education FDE (CAE) with the University of Pretoria. She furthered her studies with the University of Pretoria by enrolling for an Honours degree in Computer Integrated Education where she majored with the following subjects: Instructional Tools and Multimedia; Computers as Cognitive Tools; Assessment of Educational Programmes; E-learning; Computer-based Assessment and Research Project.

Tudu is one of the School Management Team members at the school. She is a computer expert and is the one who introduced computer studies at the school. She has been teaching at a primary school for 26 years and has taught all grades i.e. Grade 1 to Grade 6 during her teaching career. Her passion has been Grade 4 to Grade 6 learners and she has been teaching these grades for almost nineteen years. She has taught the following learning areas: Mathematics, Economic and Management Sciences, Afrikaans and Computer Studies, Arts and Culture, Afrikaans and Movement Education. She is currently teaching Grade 4 learners and is offering tuition to the teachers at the school. On the more advanced level, she has trained teachers at regional level advocating Intel Teach to the Future. She was nominated as ICT achiever of the year and she is currently an ICDL facilitator. She studied ICT at tertiary level for two years as a part-time student doing a Further Diploma in Education FDE (CAE) at the University of Pretoria. She holds an Honours Degree in Computer Integrated Education.

Lorraine is a post level one teacher teaching the Grade 3 learners in the Foundation Phase. She has taught for thirty years in the primary school. She studied for a diploma in computer studies at Macro Executives. She likes engaging learners in computer projects. For self-development, she has studies with the University of South Africa and is currently furthering her studies in School Management. Life Skills is one of her favourite learning areas. She is also engaged in the teaching of computers for the same grade.

Rose is the Head of Department of the Foundation Phase. She manages three grades i.e. from Grade 1 to Grade 3. There are six teachers that she heads and manages. She is teaching Grade 6 and her learning areas are English, Social Studies and Computers Studies. She has a thirty-five years experience and during this period she has taught all grades from Grade 1 to Grade 6. On the physical side she is a gymnast who has participated in many gymnastics competitions and achieved position one at national level in 2002. She represents the aspirations of management of the school because she is part of the School Management

Team (SMT). On the academic level, she holds an Honours Degree in Management which she obtained from the University of Pretoria.

Mary is also a post level one educator who is passionate about her work. She is much organised in planning her school documents. She joined the computer club in the year 2003 when she enrolled for a Diploma in Computer literacy at Macro Executives. She uses the knowledge she has gained to plan, organise and control her school files. Even if she is the late comer in the technological arena, she has twenty-six years experience in teaching. She has also taught all primary school subjects during her teaching career. She likes music. She studied Management at tertiary level for two years as a part-time student doing an Advanced Certificate in Education (ACE) with the University of the North-West (Potchefstroom). She furthered her studies with the University of Pretoria by enrolling for an Honours degree in Quality Assurance.

4.3 Findings

The analysis of the results of the fiveteachers identified ten emotional experiences through theme analysis. These ten experience themes are listed below:

- Uncertainty
- Concerns
- Frustration
- Anger
- Anxiety
- Happiness
- Pride
- Sadness
- Helplessness
- Future expectations.

The analysis of the ten emotional themes is found in Addendum B: 2.

4.3.1 Uncertainty

Uncertainty is the condition or instance of being in doubt, a lack of certainty (Morris, 1973).

> *I felt very small and uncertain because she always told me how interesting it was to be in front of a computer operating it (Participant 4, Line 2 – 3).*

All the instances from the raw data where participants used phrases such as “don’t know”, “felt confused” are indicative of this theme. Instances from the raw data where participants referred to sadness and depression were not considered to be related to this theme, but because there are similarities between them, they are separated for the purpose of this study. Exceptions in this study refer to the responses where one or more participants indicated opposing views to that of the majority of the participants.

Two participants showed some form of uncertainty in their responses. They reported that they did not know how to go about when the computer crashes or if the lights go off. This is brought about by the fact that some of the participants reported that they are still novices in terms of ICT. Some mentioned their doubts in terms of incorporating some Microsoft Programmes. This theme is supported by the following quotations:

> *I used to be uncertain about whether I will pass or not, I attended the lectures anyway (Participant 3, Line 3 – 4)*
>
> *…. we were not sure as to whether our plan was a good one but nevertheless continued to seek help (Participant 1, Line 27 – 29).*

4.3.2 Concerns

> *My main concern is that I am still not too confident to integrate ICT because I am still at the foundation phase but I think with given time, I will cope. To me, ICT is still a bit of a problem. I sometimes feel I will not cope if a problem arises and this is causing a lot of fear in me* (Participant 2, Line 28 – 29).

Morris (1973) defines a concern as a feeling of uneasiness about something or a threatening matter. There are indicators from the raw data when participants used phrases such as “I am not too confident”, “this is really a worrying factor you know” that are indicative of this theme. In terms of the exclusions, there were instances from the raw data where the participants referred to “lack of self confidence” and “depression” that was not considered to be related to this theme but were included to give more emphasis to this study.

Two participants reported experiencing feelings of concern. While virtually no educators think that ICT has had a very negative impact in their teaching, two participants reported experiencing feelings of concern. They reported that they felt concerned because they were still committing many errors in terms of coping with ICT demands. For example, one participant alluded to the fact that ICT is time consuming or as she says, presents her with

difficulties related to shortage of hardware/software and faults in equipment. Two of the more negative responses appear to be related to educators' own lack of confidence. This lack of confidence is associated to their concern that they will be unable to cope if things go wrong. These educators are particularly concerned about their ability to cope with unreliable hardware and software and report a wider range of problems related to class or time management, their own lack of skills and confidence and limited access.

> *It is expensive to maintain computers especially because they are second hand (Participant 2, Line 35).*

Another participant said:

> *Teachers are always concerned when faced with huge amounts of planning, in preparation for one's lessons, preparations, presentations, evaluations and recording of outcomes. These plans consume a lot of time and energy in administering the class* (Participant 3, Line 22 – 25).

4.3.3 Frustration

Vermeulen (1999) defines frustration as the condition of wanting something to change. It is about one's life, feelings which lets one to know that one is risking boredom and stagnation. Frustration happens when a comfort zone becomes uncomfortable. It is being frustrated which means to be prevented from accomplishing a purpose or fulfilling a desire. All the instances from the raw data where the participants used phrases such as "it was tough and frustrating" are indicative of this theme. The tone of their voices and the manner in which they spoke about something are also indicative of this theme wherein the tone indicated this frustration. Instances of exclusion from the raw data where the participants refer to "sadness" and "depression" were not considered to be related to this theme, but because there are similarities between them, they were separated for the purpose of this study. An exception refers to responses where one or more participants indicated opposing views to that of the majority of the participants. One participant stated:

> *It was tough and frustrating to change the mindset of the Management of the school. The school governing body was not for the idea of ICT introduction at school as they thought that this will not be successful and sustainable* (Participant 1, Line 6 – 9).

All the participants reported experiencing feelings of frustration. The participants reported feelings of frustration because they did not know what to do when the experts were not at school. Some reported feeling frustrated when the ICT officials who are qualified at regional level did not offer support and training in cases where the computers were stolen or when they broke. In other words, there were no proper policies on infrastructure.

Government is not subsidising schools with financial infrastructure especially in the North-West Province (Participant 2, Line 34 – 35).

Other participants showed their frustrations when they mentioned the following:

One is sometimes frustrated by educators who have technophobia problem which is still a challenge to technology (Participant 2, Line 35 – 37)

It was frustrating at the beginning because I am already in my prime years of teaching and I only received this tuition at age 50. I really learnt the hard way and the expectation from School Management Team which dictated that I have to be computer literate made the whole process a nightmare (Participant 4, Line 8 – 12)

I sometimes felt frustrated having to work with forty-five learners sharing eight to ten computers which makes it difficult for the class since eight learners are to use one computer (Participant 4, Line 27 – 29)

A frustrating aspect of ICT in general is its constant state of change (Participant 1, Line 12).

4.3.4 Anger

Vermeulen (1999) defines anger as a feeling forced to make a compromise that you are uncomfortable with. Anger warns that the compromise may make you give up power. Anger is a wild general feeling often covering for hurt, fear or frustration. There are appropriate actions that one has to take when one feels angry. For example, one needs to analyse the compromise and decide whether one is prepared to make it or not and consider how giving up one's power will affect one. Once a decision has been taken, live with it and let go of the energy. If this feeling covers other feelings, one has to work directly on those emotions.

According to Morris (1973) anger is defined as a feeling of extreme displeasure, hostility, indignation or exasperation towards someone or something. It is a rage or a wrath.

All the instances from the raw data where participants use phrases such as "feel angry", was "furious", "felt irritated" are illustrative of this theme. Instances from the raw data where participants referred to "frustration", "desperation" was not considered to be related to this theme but was included for the purposes of this study. One participant highlighted the following in terms of overcrowding:

But there is still another problem of overcrowding in classes which hampers the desire to work (Participant 2, Line 40 – 42)

Theft is also rife in our communities (Participant 2, Line 33 – 34).

4.3.5 Anxiety

According to Kelly (1963) anxiety occurs when a person becomes aware that the event he is faced with falls outside the range of his construction system. In other words, he/she does not have constructs to enable him/her to interpret the event properly or to make predictions. The realisation that one's construction system cannot deal with an event occurs particularly when one discovers that the circumspection does not produce any appropriate constructs, or when an event has been incorrectly predicted. I have used this definition to show how the educators experienced anxiety throughout their lives in trying to integrate ICT in the curriculum. I do not dispute the fact that these educators had to learn to integrate ICT in their spare time and at times using their own finances. One participant remarked by saying:

> *As an educator, so much is expected of you in terms of going a few extra miles. People expect to reap from you what you have sown even in times of famine but there is no remuneration to that effect* (Participant 4, Line 65 – 67).

4.3.6 Happiness

Vermeulen (1999) defines happiness as a feeling of being content with life. It is a confirmation that one's decisions are correct and the path one is on is right for one. Happiness lets one know that one's system is well balanced and one's needs are met. All five participants expressed experiencing feelings of happiness. There is an atmosphere conducive to using computers at school because the educator's life is now easy to manage. Teachers no longer carry big files that sometimes get lost but can now save their information on computers and have a backup at a later stage. Educators also expressed their view that their school is now able to train other educators.

> *I feel positive that our school is now a Tele-Centre and we can train many educators even after school. The conditions are also better because fundraising mechanisms are in place (Participant 1, Line 55 – 57).*
>
> *At last I felt contend because there was light at the end of the tunnel and wherein all stakeholders understood what we wanted to do (Participant 1, Line 45 – 47).*

One participant expressed her feelings of happiness in as far as efforts towards success of the implementation were concerned and she stated:

> *As a way of fundraising, we arranged a music festival at the stadium. We approached the Deputy Director General of Education for assistance and he was very impressed with our work and was willing to help us but guess what? The very people we worked with did not*

> *arrange the artists on time so the whole arrangement became a failure* (Participant 1, Line 23 – 28).

One participant expressed her feelings when she explained how other teachers helped her in designing a Digital Portfolio for the learners and their enthusiasm to work.

> *They were very excited about the project and wanted to work on their photo and journal pages. I began to find it difficult to keep up with them, as they wanted to record a lot of stuff. Their self-evaluation was more effective. Other staff members assisted me in creating a rubric of the skills of a performance. I then took this knowledge and went and created another rubric with the learners. This was the start of something powerful for our class group. I could see this would be a useful tool* (Participant 5, Line 57 – 64).

4.3.7 Pride

> *I managed to teach thirty educators in 2003 and was awarded ICT educator of the year in the same year (Participant 2, Line 17 – 18).*

Three participants reported some form of pride in their responses. They reported that knowledge of ICT is imperative if educators want to succeed in their teaching. This theme is supported by the following remarks:

> *Now I am proud to say that ICT integration in my school has really changed the way we used to do things and as a result a lot of time is being saved because we no longer use markers and papers like traditional teachers but we save our information in memory sticks as backups for later references* (Participant 1, Line 69 – 73).

Learners who are shy are now able to progress with ease without fear. One participant took this opportunity to discuss in general what it is like to work with these learners in integrating ICT in the curriculum and she said:

> *Computer technology has done a splendid job for me as an educator. I'm no longer a traditional teacher who always coughs information for learners to absorb. I, together with my project partner always plan activities in such a way that learners work cooperatively and collaboratively* (Participant 5, Line 134 – 138).

4.3.8 Sadness

According to Morris (1973) sadness is defined as a feeling of low spirit, dejectedness, sorrowfulness or unhappiness. He further explains that sadness is a feeling of melancholy or being downcast. Sadness is a feeling everyone experiences; most people go through a stage

of sadness sometime in their daily lives. It is natural to feel sad once in a while. When you feel sad, you think that it will last forever. When sadness does not go away it, turns into depression, which means there is a serious problem that you are worried about. In this instance I will cite what the educators stated in terms of integrating ICT in the curriculum; why they felt the world was dark and unfriendly, why they felt they were hurt deep inside and why their spirits were crushed. When the sad emotions go away, it feels as if a heavy blanket has been lifted from your heart. One participant said the following:

> *It was clear that from their experiences of integrating ICT in the classroom, many teachers are not currently in a position to make informed judgements about the suitability of a wide range of ICT to support teaching and learning outcomes* (Participant 1, Line 41 – 44).

Another participant said that:

> *It is sad to note that schools are expected to integrate ICT into their operations but there is no support from the bigger authorities (Participant 3, Line 21 – 22).*

From the gathered data there is an indication that there are sad stories that inhibit the smooth running of ICT integration in the curriculum.

> *There is an indication that there are authorities that are not wiling to support members' efforts in the implementation of ICT (Participant 4, Line 21 – 24).*

One participant lamented:

> *There is a lack of availability of personnel with ICT knowledge foundation and the workshops are supposed to run after hours. The challenge I am faced with is that forty to forty-five learners are to share eight to ten computers which makes it difficult for the class as eight learners are to use one computer which makes the life of the facilitator difficult* (Participant 4, Line 21 – 24).

4.3.9 Helplessness

Morris (1973) defines helplessness as a feeling of being unable to mange oneself, of being defenseless or dependently ineffectual without help. Five participants reported feelings of helplessness. They reported these feelings in relation to not knowing how to go about if the computers were to crash, something went wrong or even their lack of skills in conducting certain tasks in the computer. The participants reported that sometimes they wanted to quit because it was really difficult to cope with the demands of new technologies. This is what the other participant said:

> *I struggled to type and I did not know how top handle a mouse. I felt so helpless and wanted to quit but the lecturer was patient enough to*

> *teach me the basics which were not the requirements for the course* (Participant 2, Line 4 – 5).

Another participant mentioned the following:

> *I really learnt the hard way, felt helpless and the expectation from management which dictated that I have to be computer literate made the whole process a nightmare* (Participant 2, Line 4 – 5).

4.3.10 Future visions

All participants showed some form of hope for the future in their responses. They reported that their future visions are that their school will one day compete globally with the international world and this is what they said:

> *My future plans and hopes are to see Success being one of the model schools before I leave the education system for business (Participant 2, Line 41 – 42)*
>
> *I would like to see most of our learners using computers on a daily basis, networking with other learners in other countries, and using chat rooms in their projects (Participant 2, Line 42 – 45).*

One participant supported this statement when she said:

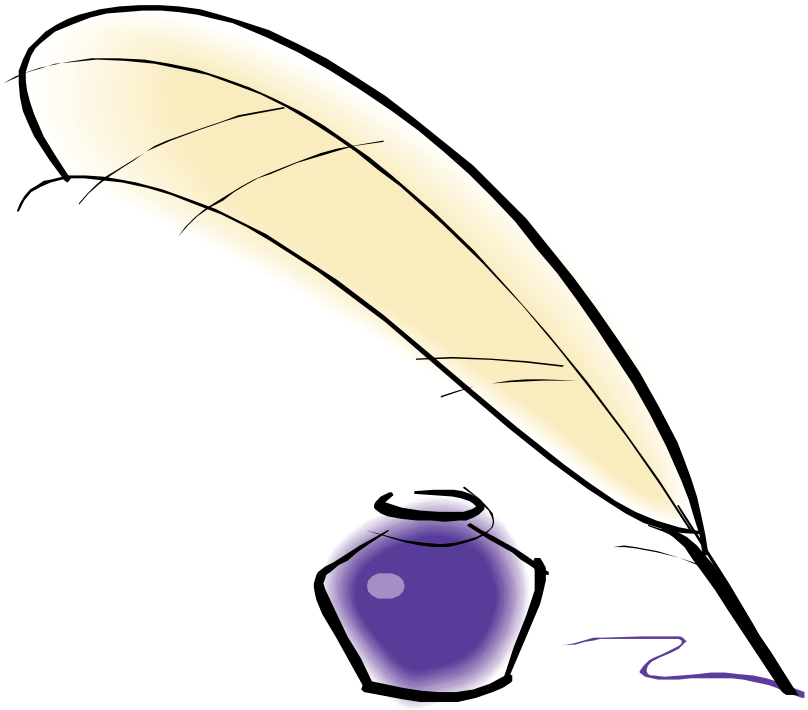
> *I would like to see ourselves as a school training other educators and showing them how we cope even if it is sometimes difficult (Participant 2, Line 28 – 30).*
>
> *… we did not give up hope as we knew that in the long run this plan would benefit the school and the community and we would have reached our goal (Participant 1, Line 16 – 17).*

After analysis of the transcribed documents, the ten emotional experiences were concatenated into four basic categories, namely fear, anger, sadness and joy. Figure 5.1 shows how the themes were concatenated into four categories. These four categories were later fused to two patterns, namely successes and challenges.

4.4 Conclusion

This chapter discussed in detail the ten emotional experiences that emerged from the data analysis and interpretation. The ten emotional experiences were then concatenated into four categories that were thoroughly dealt with. The following chapter will discuss in detail how the ten emotional experiences were grouped into the five levels of Krathwohl's Taxonomy of the affective domain in the light of relevant literature and lastly provide conclusions and recommendations.

Chapter 5



Technology resources allow easy access to information and help the educators cope with the complexities of managing individual and collaborative group work in the classroom (Ahearn, 1991).

Chapter 5
Conclusion and Recommendations

5.1 Introduction

In the previous chapter ranges of emotions and both challenges and successes were discussed. This chapter focused attention on how these themes were identified and analysed from the raw data (Strauss & Corbin, 1990). I identified and tentatively named the conceptual categories into which the phenomena were grouped by using words and phrases that appeared to be similar. From the responses of the participants the following ten experiential response topics were identified through contextual analysis: Uncertainty, concerns, frustration, anger, anxiety, happiness, pride, sadness, helplessness and future visions.

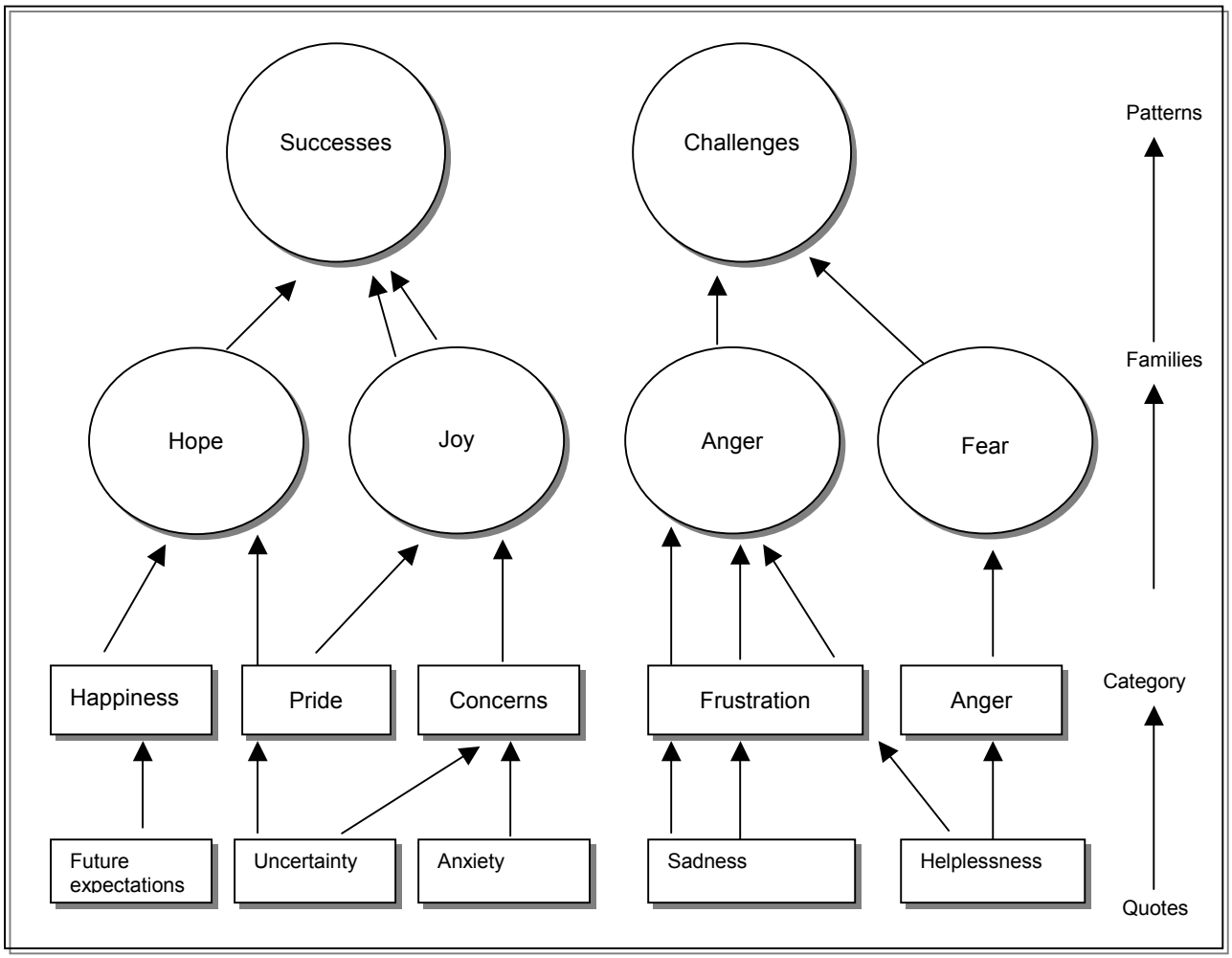
Emotional experiences, which portray feelings of uncertainty, concerns and frustration, were grouped into one category that is *fear*. All participants reported experiencing these feelings. The second category experienced by participants, was *anger*, which I enumerated from the common experiences of anxiety, sadness and helplessness. The third category of emotions identified where the teachers reported feelings of *happiness* and *pride,* this was termed *joy*. The last category of feelings was identified as *hope* relating to what the participants were hoping would happen in the future in terms of integrating ICT in the curriculum. As dominant themes, these four categories were closely followed and concatenated into two patterns according to the relationship they had, namely challenges and successes (see Figure 5.1).

5.2 Synopsis of findings

The results of this study indicate that the most common emotional responses expressed by the teachers are those of anger, joy, fear and hope. All five participants reported experiencing these emotions to a greater or lesser extent. The emotion of anger discussed above is supported by Goldstein and Mather (1998) who explain that some educators feel angry towards ICT which can lead to the issue of blaming others, for example *Teachers are always angry when faced with huge amounts of planning, in preparation for one's lessons, preparations, presentations, evaluations and recording of outcomes. These plans consume a lot of time and energy in administering the class* (Participant 3, Line 22 - 25). Smith (1998) takes this notion further and explains that this is often the school or a professional who breaks the policy of the school and becomes the object of system anger. Goldstein and Mather (1998) mention feelings of anger and resentment in the system as part of a cycle into

which respondents may fall, especially when they fail to cope with the demands of technology. Feelings of anger as an emotional response in educators with learning difficulties are also mentioned by Whitehead (2004) and Dudley-Marling (2000).

Figure 5.1: Outline of patterns from data



[Adapted from McMillan & Schumacher, 2001).

The emotion of fear is supported by Lardieri, Blacher and Swanson (2000) who explain that teachers can experience feelings of fear when they experience difficulties in operating the computer programmes and there is no support to that effect. Reduced support from others can lead to feelings of fear (Smith, 1998).

All five educators reported feelings of joy. The emotional response of joy can be related to the previously mentioned one of frustration. Participants experienced frustration from lack of support and then they experienced joy with the support that was now accessible from the

Department of Education, especially the ICT Department. The four participants who mentioned feelings of hope in this study specifically referred to feeling hopeful and optimistic that given enough tuition in ICT that will enable them to cope with its integration into the curriculum.

5.3 Using Krathwohl's affective taxonomy for ICT integration

According to Huit (2001) and Van der Horst and Mc Donald 1997) Krathwohl's Affective Domain was used where computer-integrated education at Success Primary School was assessed in view of the definitions and model. I found it relevant because Krathwohl addresses the emotions that I believe are interrelated with experiences. Because the participant's feelings were investigated, Krathwohl's Affective Taxonomy emerged as focus of emphasis to evaluate the development of the educators' stories in integrating ICT in the curriculum.

This domain was suitable as it addresses interests, experiences, opinions, appreciations, values and emotional sets. Notably, the educators elicited support and motivation from their fellow colleagues who were somehow engaged in trying to implement ICT in the curriculum. I therefore incorporated Malone's Theory of Motivation to elaborate on the affective experiences as adapted from Huit (2001) and Van der Horst and McDonald (1997). According to Seels and Glasgow (1990) this taxonomy is ordered according to the principle of internalisation. Internalisation refers to the process whereby one's affect toward an object passes from a general awareness level to a point where the affect is 'internalised' and consistently guides or controls one's behaviour. Krathwohl (1964) uses the following five levels in the affective domain organised according to the commitment and described in terms of increasing levels of complexity regarding attitudes and emotional responses:

- Level 1: Receiving
- Level 2: Responding
- Level 3: Valuing
- Level 4: Organising
- Level 5: Internalisation.

A thorough discussion of how the levels interact with the experiences of teachers follows in the next paragraphs.

5.3.1 Receiving or attending

This is the level where the teacher becomes aware or is sensitive to something. He /she demonstrate a willingness to attend to a particular phenomenon or stimulus. An example of receiving in an ICT-based classroom would be where the learner becomes actively involved in the learning process where the teacher becomes the facilitator who guides the learning process. Teachers can show emotions of fear, anger and anxiety if they lack the skills of integrating ICT. The provision of systematic pedagogical support on the use of ICT would make teachers (regardless of their age) more confident with ICT. The second level of Krathwohl's Taxonomy of the affective domain is called valuing.

5.3.2 Responding

Responding refers to the individual's motivation to learn certain things. In this study, teachers felt motivated to wanting to know more about ICT and the manner in which technology has advanced itself. Through this enthusiasm, teachers realise that their increased knowledge will enable them to teach the learners according to approved standards. Active participation on the part of the teachers entails opening new initiatives where ICT is involved and there is also support. There is also an ongoing course for educators who are computer illiterate and this is doing wonders in terms of recording. Learning outcomes emphasise compliance in responding, willingness to respond, or satisfaction in responding (motivation). The third level of Krathwohl's Taxonomy of the affective domain is called valuing. Kort, Relly and Picard (2001) postulates that teachers who work with technology know that failure is part of learning with experiences of associated affective responses.

5.3.3 Valuing

This level involves the worth or value a person attaches to a particular object, phenomenon or behaviour. This ranges from simple acceptance to the more complex state of commitment. The school curriculum reflects the perceived value and importance of developing ICT literacy and information literacy for all learners. ICT is identified as one of the core skills areas at school and as such the option of certification of achievement is available. Valuing is based on the internalisation of a set of specified values, while clues to these values are expressed in the teacher's overt behaviour and are often identifiable. A person with good self-esteem shows characteristics of willingness to participate and this is shown when teachers portray a sense of pride in their work (Meyers and Meyers, 1973). According

to Loevinger (1970) the perspective of value views the person as an active initiator and a reactor within the context of his or her environment. In integrating ICT in the curriculum, the educator cannot fully change the environment, but neither can the environment fully mould the individual. A person's actions are the result of his or her feelings, thoughts, behaviours and experiences. Although the environment can determine the content of one's experiences, it cannot determine its form. A major assumption is that valuing is the cognitive process of determining and justifying facts and beliefs derived from those facts and is interrelated with the affective process of experiences. This approach concentrates primarily on social values rather than on the personal moral dilemmas presented in the moral development approach.

5.3.4 Organising

It is at this level where values are organised into priorities by contrasting different values, resolving conflicts between them and creating a unique value system. The emphasis is on comparing, relating, and synthesising values. In organising the value system, it was found that ICT integration promoted the teachers awareness of, appreciation for and confidence in their ability to analyse, select, and craft technology-based lessons. With regard to organisation, Addison, 1981:13 claims that teachers need to relate the organisation of teaching situations to the needs of the learners, individual work and group activity.

5.3.5 Internalising values or characterisation

Characterisation considers the total behaviour of the individual. The individual lives in a manner very consistent with an internalised philosophy of life. The behaviour is pervasive, consistent, predictable, and most importantly, characteristic of the learner. Instructional objectives are concerned with the student's general patterns of adjustment (personal, social, emotional). Feelings of isolation, frustrations with technology, anxiety and helplessness are some of the factors that may lead to teachers not pursuing ICT in their professional developments (Rovai, 2003:5).

If there are enough computers in each centre to accommodate all the learners in a class, peer tutoring is not necessary but is encouraged. The teachers using teaching with computers regard themselves more as facilitators than teachers. Collaboration and discussion between the different teachers teaching computers at Success Primary School is encouraged. Opportunity for discussion is created during the regular computer meetings set up by the Head of Department for Computers. The curriculum is modified in certain instances to fit in with the technology available. Some of the more apparent changes are:

- Team teaching resulting from peer observation
- Cooperation between teachers as they share new instructional methods
- The school timetable is changed to accommodate team teaching.

Teachers use collaborative and cooperative teaching in their practice where different applications for collaborative and creative work are used. The computer applications are used as knowledge-building tools to support a growing constructivist approach to learning. Outcomes are assessed for the computer department staff differently than for the rest of the staff. The main focus of this model is the cooperation between the teachers on the staff. Teachers start questioning their teaching methodologies and their assessment strategies. The only way in which they make good ICT integration practice a personal issue is if they have internalised the concepts and principles and make them their own. Table 5.1 outlines the relationship between Krathwohl's affective domain and emotional experiences of the teachers.

Table 5.1: The relationship between Krathwohl's affective domain and emotional experiences

	Krathwohl's Levels					
Codes for this study		Receiving	Responding	Valuing	Organising	Internalisation
	Anxiety	√				
	Anger	√	√			
	Fear	√	√			
	Happiness			√		√
	Pride			√		√
	Concerns				√	
	Frustration		√			
	Sadness		√			
	Helplessness		√			
	Future expectations			√	√	√

5.4 Success of ICT integration

Change is inevitable. In terms of the successful use of ICT in the curriculum, all teachers must continually challenge the known and embrace the unknown. The success or failure of the use of computers in the classroom will ultimately come down not to the technology itself,

but to the quality of the implementation of curriculum by the educator. While the training to date has clearly created an awareness of ICT and encouraged many non-computing specialists to use ICT in the classroom, it has also left teachers feeling the need for much more support and training. Many feel they have acquired a basic knowledge of a narrow range of ICT but are not progressing beyond this. They feel they have some competence to use a narrow range of ICT but do not feel as competent as they need to be when faced with teaching others to use ICT. In particular, they feel that they lack the kind of understanding they need to integrate ICT fully within the curriculum.

It will not be easy to overcome the problems described in the previous section. However, researchers have made positive steps in recent years and it is clear that ICT, despite the problems that inevitably arise with the implementation of new initiatives, has enormous potential for enhancing teaching and learning.

There are many ways in which ICT has contributed, and will continue contributing to processes of school improvement. This can occur particularly through the use of new technology as an aid to independent learning, namely as a motivator of students of all abilities; as a set of tools for professional development and as a set of innovative mechanisms for assessment and monitoring. Further research is needed in all of these areas. While it may often be impossible to establish a causal link, there is no reason why associations cannot be demonstrated. In addition, the judicious combination of quantitative data and qualitative information and collaboration between teachers and researchers will help to provide meaningful pictures of 'what works' in the classroom.

What comes out very strongly from a reading of the literature on ICT and classroom is that this is probably the key to how ICT and school improvement research can be brought together when is stressing the need for human interaction and structured teaching and learning to accompany the use of new technologies in educational settings. Learning involving ICT applications must be carefully planned, clearly set out and well sequenced (and in this respect the requirements for a successful lesson using ICT are no different from those of a good lesson generally).

Fundamental changes are taking place, but clearly the role of the teacher remains pivotal. The key point is that learners must not just simply be left to use the technology (Cox, 1999) with the assumption that standards of academic performance will improve. Social interaction between learners and learners, and between teachers and learners, is a vital part of the process of learning through the use of computer technology. Just as there is a need to base

school improvement on teaching and learning in the classroom, so there is a need to instill learners' ICT work in a context of meaningful interpersonal support.

In evaluating the research from the teachers' perspectives, teachers using ICT effectively experienced the following factors of success:

- Strong and experienced ICT curriculum and management leadership. Support by the principal or senior management is the single most important determinant of whether a school is able to optimise the use of ICT
- Teachers well trained in ICT use and effective pedagogy
- Access to high quality technology – hardware, software and communication
- Access to proven resources
- Ongoing assessment tools – associated directly with teaching programmes
- Effective operational, administrative and technical support (so teachers are free to teach)
- Effective and developing networks between teachers – so that good ideas and knowledge about learning programmes and access to teaching and management resources can be shared.

The success of ICT integration at the school is not only one person's business but it is the business of all the stakeholders.

5.5 Challenges of ICT integration

One of the greatest challenges facing educators is striking a balance in the types of use of ICT in the classroom. Attitudes and perceptions of teachers, parents and learners are instrumental in navigating a way forward. There are general competencies, common to all the users, whatever the experiences in any particular subject area. The focus of training and professional development needs to be upon these areas as teachers' technical confidence and competence grows.

5.6 Sustainable development

Throughout the study, one of the burning issues in terms of ICT integration has been the sustainability of effective development work. Most of the teachers felt that there were already considerable demands on their time. Several factors affected how the teachers were able to maintain their momentum in using ICT to support more effective teaching and learning. The

following are some of the challenges that need to be considered in integrating ICT in the school curriculum:

- The role of the site manager in supporting such development work
- The support of other colleagues in school is another factor that the teachers found helpful
- Technical issues which arise need to be overcome quickly and effectively.

Each of the teachers in this study seemed to have a critical point of confidence and skill. This was related to developing their use of ICT in their teaching, as opposed to developing their own ICT skills, which a few of the teachers felt was their personal priority. Choosing software that can be used in different ways is also helpful. Teachers who were involved reported greater use of ICT for direct instruction compared with other teachers. They also reported changes in patterns of use reflecting a clearer focus on identifying where ICT could support their teaching of literacy.

5.7 The significance of the challenges and the successes of ICT integration

This research shows that in order to integrate ICT in the curriculum one has to observe that change is inevitable. In terms of the successful use of ICT in the classroom, all teachers and administrators must continually challenge the known and embrace the unknown. The success or failure of the use of computers in the classroom will ultimately come down not to the technology itself, but to the quality of the implementation of curriculum by the teacher.

Bennett and Lockyear (1999) point out that while a significant body of theoretical and anecdotal literature exists on the potential benefits of Information and Communication Technology, relatively few rigorous and systematic studies have investigated the impact of educators' experiences of such technologies. One of the reasons for this, says Newman (1997) is that many people do not understand how and why ICT should be integrated in education, making the mistake that either computers are used in the same way as in business or else just for drill- and- practice activities, but the question of how teachers interact with integration of such technologies is not given enough recognition. One of the problems with the integration of ICT is that it often uses standard tests as a measure of success without considering the qualitative way of how emotions are experienced. These tests are based on the old paradigms of teaching and thus measure what is easy to assess in a content-focused curriculum rather than or what should be assessed.

Bennett and Lockyear (1999) also point out that in a study of the experiences and behaviour of group teachers using the Internet, increased motivation and focus were observed on the learning task. A follow-up of emotional experiences showed some evidence of intimidation or frustration among the group because of their limited computer experience. This is in contrast to many teachers who were educated in a system that did not encourage risk-taking and exploratory learning. Such people become frustrated with a computer-based task if they feel they lack the necessary skills to impart knowledge to learners.

5.8 Limitations of the study

This study focuses on a very specific group of teachers, namely those who are teaching in a primary school and are female educators with teaching experience but with average experience in ICT implementation. The results reflect the experiences of educators who are integrating ICT in their lessons. The possibility exists that these teachers, who are integrating ICT, may report experiencing different emotional responses. However, as this study is qualitative in nature, with a constructivist and interpretive paradigmatic viewpoint, the aim is essentially to reflect the voices of these five teachers relating their subjective experiences and not to generalise the findings to all teachers who are integrating ICT in the school curriculum.

5.9 Recommendations for further research

Although there is a considerable body of literature on the use of ICT in the school curriculum, certain aspects require further research, namely:

- The use of ICT in primary learning programmes with special reference to the Foundation Phase
- The attitudes of both teachers and learners towards the use of ICT in specific learning areas, for example Mathematics in previously disadvantaged environments
- The interpretive and exploratory capabilities of ICT and the instruction required to exploit them
- A study of emotional responses of fathers in implementing ICT to children with learning difficulties in mainstream, inclusive education.

5.10 My reflections on the study

The outcome of this study indicates that although female teachers experience positive emotions in using ICT, they also experience a number of negative emotions in response to the integration of ICT. For the success of ICT usage in schools, technology has to be adapted on a continuous basis so as to be on par with the international world. A further contribution of this study is that experiences of the educators are not simply named, but are explored in depth. Each response was explored in order to understand the different contexts and experiences from which it emanated. Experiences do not appear in isolation but in response to a person's specific life world. To be able to use ICT more efficiently, choosing training sessions and participating in new developments in order to improve professional development is of vital importance.

The White Paper on e-Education states that the introduction of information and communication technologies (ICTs) in education represents an important part of Government's strategy to improve the quality of learning and teaching across the education and training system. The policy intention is to focus on learning and teaching for a new generation of young people who are growing up in a digital world and are comfortable with technology. From this research it is clear that there should be rigorous provision of developing teachers in implementing ICT and not focus on the young generation. In his study, Ahearn (1991) concluded that technology resources allow easy access to information and help teachers cope with the complexities of managing individual and small-group work in the classroom.

Integration of ICT into a school, as in all other areas, needs human resources to support users work and needs. Hence there must be experts or specialist teachers who will spend a great amount of time acting as resource persons or ICT co-ordinators. Without this human support, integration will not take place, whatever good the other factors are allowing ICT use and integration .The ICT specialist can also be the one who actually teaches Computer studies at a lower or advanced level. But this task can also be taken care of by another educator. Also, specialised teachers should teach the more specialized ICT curriculum Units in vocational education.

5.11 Conclusion

The integration of ICT in the curriculum has great potential for teachers' lessons as educators have access to a wide range of current knowledge. As more schools make use of

the World Wide Web, instructional quality will continue to get better and better. Teachers' experiences are of paramount importance for the success or failure of educational approaches and media. Therefore, more consideration should be given to teachers' experiential knowledge in integrating ICT in the curriculum. Research reveals positive effects on instruction and learning when technology is used to its full potential. It is therefore important that teacher education programmes determine effective ways to prepare teachers to integrate technology into their classrooms. The works of Papert (1980) who was an early critic of traditional approaches to instruction and learning that emphasise isolated skills advocate a less structured environment that would let educators use computers to get learners to think and solve problems. Piaget's (1972) theories of cognitive development provide the seeds for the growth of constructivism. Papert took the seeds, nurtured them and produced an exemplary practice for educators. The use of computing technology as part of the practice is crucial since it provides a link to the older generation (teachers). This research investigated the effects of engaging teachers in ICT training sessions that are designed to prepare them for integrating technology into the school curriculum.

This study serves as a stepping-stone for future research. There are investigations involving comparisons of confidence levels and lesson quality among classroom teachers who participate in the ICT integration described in this paper with those who would further define the effects of ICT training. Incorporating and studying the effects of the training sessions in professional development programmes were also provide deeper insight into their influence on educators' development. Training teachers to integrate technology coupled with continued investigation into its effects on teaching and learning serves to empower technology-based learning environments. The research efforts presented in this study exemplify how ICT education can serve as a catalyst for effective use of instructional technology.

Research reveals positive effects on instruction and learning when technology is used optimally. It is therefore important that education programmes determine effective ways to prepare teachers to integrate technology in their classrooms. The results of this study indicate that teachers who integrate ICT in the curriculum experience a range and complexity of emotions. It appears that there may be a general range of emotional responses from more negative emotions to more positive emotions. There is, however, a key factor that seems to be strongly related to emotional responses experienced by the teachers, namely a lack of confidence especially when implementing programmes that are not well understood. As processes and work become increasingly complex, technologies can assume the more mundane functions and free us for tasks that are more complex and fuzzy. The results of this study further indicate that as society becomes more global, collaboration across boundaries

through experiential networks becomes increasingly necessary. The experiences of the teachers indeed show that the more technologically adept we become, the more advanced and successful we will be in the near future.

References

References

Addison, A.F. (1981). Developing Mathematical Thinking. London: Wesley Publishers Ltd.

Ajzen, I. (1988). *Attitudes, personality and behavior.* Open University

Ahearn, E. (1991) *Real restructuring through technology.* Perspectives 3, Council for Basic Education, Washington, DC (ERIC Document Reproduction No. ED 332318).

Alessi, S.M. & Trollip, S.R. (1991). Computer-Based Instruction: *Methods and Development* (2nd ed.). New Jersey: Prentice-Hall.

Anderson, L.S & Perry, J.F. (1996). *Technology Planning: Recipe for success*. Retrieved January 14, 2006, from http://www.2.msstate.edu/~lsa1/nctp/tp/recipe.html

Anderson, R. & Killenberg, G. (1999). *Interviewing: Speaking, listening and learning for professional life*. Mountain View, CA: Mayfield.

Asch, S. (1952). *Social psychology*. Englewood Cliffs, NJ: Prentice-Hall.

Badenhorst, D.C. (1993). *School management: the task and role of the teacher.* Pretoria: HAUM.

Becker, H.J. (1999). *Internet use by teachers: Conditions of professional use and teacher-Directed Student Use*. University of Carlifornia, Irvine: Center for Research on Information Technology and Organisation. Retrieved November 14, 2005, from http://www.crito.uci.edu/TLC/findings/Internet-Use/startpage.htm

Bennett, S. & Lockyear, L. (1999). *The impact of digital technologies on teaching and learning in K–12 education: Research and literature review final report,* prepared for Curriculum Corporation by Faculty of Education. New South Wales, Australia: University of Wollongong.

Berge, Z.L. (1995). Facilitating Computer Conferencing: Recommendation from the field. Educational Technology, January-February, 35(1), 22-30.

Biswas, N.B. (1994). The role of computer in school curriculum: Some issues in media and technology for human resource development. *(An International Journal of Educational and Training Technology,* 6(2): 129 -133, Jan – March 1994.

Briner, M. (1999). *Constructivism*. Retrieved November 17, 2005, from http://www.dean.usma.edu/math/activities/cape/Constructivism/501const.htm

Bruner, J. (1986). *Actual minds, possible worlds*. Cambridge, MA: Harvard University Press.

Bruner, J. (1996). The culture of education. Cambridge: Harvard University Press.

Bryman A (2001) Social Research Methods. New York, Oxford University Press.

Burbules, N.C. & Calister, T.A. (2000). Universities in transition: The promise and the challenge of new technologies. *Teacher's College Record*, 102(2): 271-293.

Busch, C., De Maret, P.S., Flynn, R., Kellum, R., Le, S., Meyers, B., Saunders, M., White, R., & Palmquist, M. (2005). *Content analysis: Writing @ CS*. Colorado State University Department of English. Retrieved January 15, 2006, from http://writing.colostate.edu/references/research/content/.

Carl, A.E. (1995). *Teacher empowerment through curriculum development: Theory into practice*. Cape Town: Juta.

Carter, K. (1996). *Approved planning process. Technology and learning*.

Cashman, T.J., Gunter, G.A., Gunter, R.E. & Shelly, G.B. (2004).*Integrating Technology in the classroom (3rd Ed.)*. Boston: Course Technology.

Chalkley, T.W. & Nicholas, D. (1997). Teachers' use information technology: observations of primary school classroom practice. *Aslib Proceedings*, 49(4):65 -76.

Cohen, L., Manion, L. & Morrison, K. (2000*). Research methods in education* (5th ed.*).* New York: Routledge Falmer.

Cox, M.J. (1999). Motivating pupils through the use of ICT. In Leask, M. & Pachler, N. (Eds.). *Learning to teach using ICT in the secondary school.* London: Routledge.

Creswell, J.W. & Miller, D.L. (2000). Determining validity in qualitative inquiry. *Theory into Practice*, 39(3).

Creswell, J.W. (2002). Narrative Research designs. In Creswell, J.W. (Ed.). *Educational research.* Columbus: Merrill Prentice-Hall.

Creswell, J.W. (2003). *Research Design: qualitative, quantitative, and mixed approaches* (2nd ed.). Thousand Oaks, London: Sage.

Dabbs, J.M., Faulkner, R.R & Van Maanen, J. (1982). *Varieties of qualitative research.* Beverly Hills: Sage.

Dalton, J.H., Elias, J.M. & Wandersman, A.C. (2001). *Community psychology: Linking individuals and communities*. Australia: Stamford.

Davis, F.D., Bagozzi, R.P. & Warshaw, P.R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, 35(8):982-1003.

Denzin, N.K. (1989). *The Research Act (3rd Ed)*. Englewood Cliffs, NJ: Prentice-Hall.

Denzin, N.K. & Lincoln, Y.S. (1994). Introduction: Entering the field of qualitative research. In N.K Denzin & Y.S. Lincoln (Eds.). *Handbook of qualitative research*. Thousand Oaks, CA: Sage.

Denzin, N.K. & Lincoln, Y.S. (2000). Introduction: The discipline and practice of qualitative research. In N.K Denzin & Y.S. Lincoln (Eds.). *Handbook of qualitative research* (2nd ed.). Thousand Oaks, London: Sage.

Department of Education. (2004). *White Paper on e-Education.* Cape: Somerset Printers.

Department of Education. (1997). *Lifelong learning for the 21st century.* Pretoria: Government Printers.

Dickinson, D. (2002). Learning through many kinds of intelligence. New Horizons for Learning.

Diener, E., & Crandall, R. (1978). *Ethics in social and behavioural research.* Chicago: University of Chicago Press.

Dudley-Marling, C. (2000). A family affair: When school troubles come home. Portsmouth, NH: Heinemann.

E-Learn Frames. (2001). *Glossary of e-leaning*. Retrieved October 10, 2005, from http://www.learnframe.com/aboutelearning/glossary.asp

Firestone, W.A. (l987). Meaning in method: The rhetoric of quantitative and qualitative research. *Educational Researcher*, l6 (7):16-21.

Frankfort-Nachmias, C. & Nachmias, D. (1992). *Research methods in the social sciences*. London: Edward Arnold.

Garbers, J.G, Muller, A. & Van Zyl, C. (1988). *The role of research in the provision of education by means of the electronic media in RTV,* 1(4): 7 – 14.

Gay, L.R. & Airasian, P. (2003). *Educational research: Competencies for analysis and applications* (7th ed.). New Jersey: Merril Prentice-Hall.

Gall, M.D., Borg, W. R. & Gall, J.P. (1996). *Educational research: An introduction* (6th ed.). USA. Longman.

Gilbert, K.R. (2001). The emotional nature of qualitative research. Boca Raton Fla: CRC Press.

Ginsberg, M.B. & Wlodkowski, R.J. (2000). *Creating highly motivating classrooms for all students: a schoolwide approach to powerful teaching with diverse learners*. San Francisco: Jossey-Bass Publishers.

Goble, F.G. (1970). *The third force.* New York: Grossman.

Goldstein, S. & Mather, N. (1998). *Overcoming underachieving: An action guide to helping your child succeed at school.* New York: John Wiley & Sons, Inc.

Guba, E.G. & Lincoln, Y.S. (l981). *Effective evaluation*. San Francisco: Jossey-Bass.

Hatch, J.A. (2002). *Doing qualitative research in education.* Albany: State University of New York Express.

Hawkridge, D. (1990). *Computers and learning*. London: Addison-Wesley.

Henry, J. W. & Stone, R.W (1997). The development and validation of computer self-efficacy and outcome expectancy scales in a non-volitional context. *Behaviour Research Methods, Instruments & Computers*, 29(4):519-527.

Hepp, P. & Laval, E. (2002). ICT for rural education*: A developing country perspective. In IFIP WG 3.5 (Informatics in Elementary Education).* UK: Manchester.

Howie, S J. (2005). Information and communication technologies in South African secondary schools. Cape Town : HSRC Press

Hoyle, E. (1985). The professionalization of teachers: a paradox. In Gordon, P. Is teaching a profession? London: Heinemann.

Huitt, W. (2001). *Krathwohl's et al. taxonomy of the affective domain.* Retrieved October 05, 2005, from http://chiron.valdosta.edu/whuitt/col/affsys/affdom.html

International Society for Technology in Education. (2000) *National educational technology standards for students: Connecting curriculum and technology*. Eugene, OR: Author.

Jackson, M., Bartle, C. & Walton, G. (1999). Effective Use of Electronic Resources. *Innovations in Education and Training International*. 36(4):320-326.

Katz, Y.J., Evans, T. & Francis, L.J. (1995). The reliability and validity of the Hebrew version of the Bath County computer attitude scale. *Journal of Educational Computing Research*, 13(3):237-244.

Kearsly, G. (1998). Educational Technology: A Critique. *Educational Technology,* March-April, pp. 47-51.

Kelly, G.A. (1963). *A theory of personality: The psychology of personal constructs*. New York: Norton.

Kirk, J. & Miller, M. (1996). *Reliability and validity in qualitative research, Qualitative research methods*, Series Vol. 1. Newbury Park, CA: Sage.

Kort, B., Reilly, R. & Picard, R.W. (2001). An affective model interplay between emotions and learning: Reengineering educational pedagogy- building a learning companion. Retrieved January 05, 2006, from http://affect.media.mit.edu/projectpages/lc/icalt.pdf

Krathwohl, D. R., (1964). *Taxonomy of educational objectives: The classification of educational goals-Handbook II: Affective domain*. New York: McKay Co.

Krathwohl, D.R, Bloom, B.S & Masia, B.B (1956). *Taxonomy of educational objectives. Handbook II: Affective domain.* New York: David McKay Co.

Krathwohl, D.R., Bloom, B.S. & Masia, B.B. (1964). *Taxonomy of educational objectives: Handbook II: Affective domain.* New York: David McKay Co.

Krueger R. (1988). *Focus group: A practical guide for applied research*. London: Sage.

Labuschagne, A. (2003). *Qualitative research - Airy fairy or fundamental? The Qualitative Report,* Volume 8, Number 1 March 2003. Retrieved January 05, 2006, from http://www.nova.edu/ssss/QR/QR8-1/labuschagne.html

Labov, W. & Waletzky, J. (1967) Narrative analysis: oral versions of personal experience. In: Helm J (Ed) Essays on the Verbal and Visual Arts. Seattle, University of Washington Press.

Lardieri, L.A., Blacher, J. & Swanson, H.L. (2000). Sibling relationships and parent stress in families of children with and without learning disabilities. *Learning Disability Quarterly,* 23(2):105-116.

Laudon, K.C., Traver, C, G. & Laudon, J.P. (1996). *Information technology and society.* London: International Thomson Publishing.

Laval, E. & Hinostroza, E. (2002). Chilean Schools: The Enlaces Network. TechKnowLogia. 4 (3).

Lieblich, A., Tuval-Mashiach, R. & Zilber, T. (1998). *Narrative research: reading, analysis and interpretation.* New Delhi: Sage Publications.

Lincoln, Y. S. & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage Publications.

Lincoln, Y.S. & Guba, E.G. (1981). Epistemological and methodological bases for naturalistic inquiry. *Educational Communications and Technology*, 30:233-252.

Little, J.K. (1998). *Affective domain (Krathwohl).* College of Education. University of Tennessee. Retrieved October 03, 2005, from *http://itc.utk.edu/~jklittle/edsmrt521/affective.html*

Locke, E., Shaw, K.N., Saari, L.M. & Lathan, G.P. (1981). Goal setting and task performance. *Psychological Bulletin,* 90:169-181.

Loevinger, J. (1970). *Measuring ego development. Volumes I and II.* San Francisco: Jossey-Bass.

Lundall, P. & Howell, C. (2000). *Computers in schools: A national survey of information communication technology in South African schools.* Johannesburg: Shereno Printers.

Lumsden, L.S. (1994). *Student motivation to learn.* ERIC Digest, Number 92. ERIC clearing house on Educational Management, Oregon.

Magill, F.N. (Ed.) (1996). *International encyclopedia of psychology*, Vol.1. London: Fitzroy Dearbon Publishers.

Malone, T.W. (1981). Towards a theory of intrinsically motivating instruction. *Cognitive Science*, 1981 (1) :(333-369).

Malone, T.W. & Lepper, M.R. (1987). Making learning fun: A taxonomy of intrinsic motivation for learning. In R.E. Snow & M.J.Farr (eds.). *Aptitude, learning and instruction: III. Conative and affective process analysis*. Hillsdale, N.J: Lawrence Erlbaum.

Marshall, C. & Rossman, G.B. (1989) Designing Qualitative Research. Newbury Park, Sage.

Martin, B. L., (1989). A checklist for developing instruction in the affective domain. *Educational Technology*, August, 7-15.

Maslow, A.H. (1970). *Motivation and personality* (2nd ed.). New York: Harper.

McCombs, B.L. & Whisler, S.J. (1997). *The learner centered classroom and school: Strategies for increasing student motivation and achievement.* San Francisco: Jossey-Bass Publishers.

McLeod, J. (1996). Qualitative research methods in counselling psychology. In Woolfe, R. & Dryden, W. (eds.). *Handbook of counselling psychology.* London: Sage Publications.

McMillan, J. H. & Schumacher, S. (1993). Research in Education: *A conceptual Introduction* (3rd ed.). New York. Harper Collins College Publishers.

McMillan, J.H. & Schumacher, S. (1997). Research in Education: *A conceptual Introduction* (4th ed.). New York. Longman, Inc.

McMillan, J.H. & Schumacher, S. (2001). Research in Education: *A conceptual Introduction* (5th ed.). New York: Addison-Wesley Longman.

Merriam, S. B. (1988). *Case study research in education: A qualitative approach*. San Francisco: Jossey-Bass Publishers.

Merriam, S.B. (1998). *Qualitative research and case study applications in education. Revised and expanded from case study research in education.* San Francisco: Jossey-Bass Publishers.

Meyers, G.E. & Meyers, M.T. (1973). The dynamics of human communication. New York: McGraw-Hill.

Miles, M.B. & Huberman, A.M. (1994). *Qualitative data analysis: An expanded source book* (2nd ed.). Thousand Oaks, CA: Sage.

Miller, P. (1997). *The integration of computers at Pinelands High School: A case study.* Mini-thesis. M.Ed. (CAE). Pretoria: University of Pretoria.

Ministerial Advisory Council on the Quality of Teaching. (n.d).Computer proficiency for teachers. Retrieved January 03, 2005, from https://www.det.nsw.edu.au/reviews/macqt/comppro.htm#4.3

Morris, W. (eds.). (1973). *The heritage illustrated dictionary of the English language*. Boston: American Heritage Publishing Company.

Morse, J.M. (1994*). Emerging from the data: The cognitive processes of analysis in qualitative inquiry.* CA: Sage Publications.

Muller, J.H. (1999). Narrative approaches to qualitative research in primary care. In Crabtree, B.F. & Miller, W.L. (eds.). *Doing qualitative research* (2nd ed.). Thousand Oaks: Sage Publications.

Mwamwenda, T.S. (1996). *Educational psychology: An African perspective* (2nd ed.). Butterworth, Durban: Heinemann.

Newman, W. (1997). *Principals, IT and leadership coping with professional development despite isolation: Capacity building for IT in education in developing countries.* Gail Marshall & Mikko Ruohonen (eds.). Chapman and Hall.

Oosthuizen, B.L. (1997). *Information needs of the teachers of Orange Farm*. South African Journal for Library and Information Science, 65(4): 227-233.

Orlikowski, W.J. & Baroudi, J.J. (1991). Studying information technology in organizations: Research approaches and assumptions. *Information Systems Research,* 2(1):1-28.

Open Learning Technology Corporation. (1996). *Learning with software: pedagogics and practice. Learning Concepts.* Retrieved January 10, 2006, from http://www.oltc.edu.au/cp/05.htm.

Pachler, N. (1999). Theories of learning and ICT. In Leask, M & Pachler, N. (eds.). *Learning to teach using ICT in the Secondary School*. London: Routledge.

Pallof, R.M. & Pratt, K. (1999). *Building learning communities in cyberspace: Effective strategies for the online classroom.* San Francisco: Jossey-Bass Publishers.

Papert, S. (1980). Mindstorms: Children, computers and powerful ideas. New York: Basic Books.

Piaget, J. (1972). *The psychology of the child*. New York: Basic Books.

Pillemer, D.B. (1998). *Momentous events, vivid memories.* Cambridge, MA: Harvard University Press.

Posner, G.J. & Rudnitsky, A.N. (1982). Course design: A guide to curriculum development for teachers. New York: Longman.

Rebore. R.W. (1987). *Personal administration in education: A management approach.* New Jersey: Prentice-Hall.

Robinson, L. (2002). Notes on Diffusion of Innovation theory. Retrieved January 14, 2006, from http://www.socialchange.net.au

Rogers, E.M. (1962). Diffusion of Innovations. The Free Press. New York.

Rossman, G.B. & Rallis, S.F. (1998). *Learning in the field: an introduction to qualitative research.* Thousand Oaks, CA: Sage.

Rovai, A.P. (2003). In search of higher persistence rates in distance education online programs. The Internet and Higher Education, 6(1): 1- 16. Retrieved January 14, 2006, from http://www.google.co.za/search?hl=en&q=Rovai%2C+A.P.+%282003%29.+In+search+of+higher+persistence+rates+in+distance+education+online+programs.+The+Internet+and+Higher+Education%2C+6%281%29%3A+1-+16.+&btnG=Google+Search&meta=

SAQA (2001). *The NQF and Curriculum 2005*. Retrieved January 14, 2006, from http://www.saqa.org.za/publications/index.html

The Dictionary of the History of Ideas. (2003). Retrieved January 14, 2006, from http://etext.virginia.edu/cgi-local/DHI/ot2www-dhi?specfile=/texts/english/dhi/dhi.o2w

Seels, B. & Glasgow, Z. (1990). *Exercises in instructional design*. Columbus Ohio: Merrill Publishing Company.

Smith, C.R. (1998). *Learning disabilities: The interaction of the learner, task and setting* (4th ed.). Boston: Allyn & Bacon.

Spradley, J.P. (1980*). Participant observation*. New York: Holt, Rinehart & Winston.

Stake, R.E. (1978). The case study method in social inquiry. *Educational Researcher*, *7*(2):5-8.

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques.* Newbury Park, CA: Sage Publications, Inc.

Stephenson, J. 2001. Teaching & learning online, pedagogies for new technologies: United Kingdom: Kogan Page Limited.

Tesch, R.C. (1991). Computers and qualitative data II. *Qualitative Sociology*, 14(3).

The Council for Global Education. (1997). *Moral education: A parent's questionnaire.* Washington, DC: Author. Retrieved December 2005, from http://www.globaleducation.org/.

United Nations Development Programme (UNDP) (2001). *Creating a development dynamic: final report of the digital opportunity initiative.* Retrieved November 03, 2005, from http://www.opt-init.org/framework

Valuebasedmanagement.net. (2006). Innovation adoption curve of Rogers. Retrieved January 03, 2006, from http://www.valuebasedmanagement.net/

Van Rensburg, C.J.J. & Landman, W.A. (1996). *Notes on Fundamental Pedagogic concepts – An introductory orientation.* Pretoria: NGKB.

Van der Horst, H. & McDonald, R. (1997). *Outcomes-based education. A teacher's manual.* Pretoria: Kagiso Publishers.

Vermeulen, S. (1999). *EQ: Emotional Intelligence for everyone.* Cape Town: Johnnic Publishing Group.

Watson, D.M. (Ed.). (1993) *IMPACT - An evaluation of the IMPACT of the information technology on children's achievements in primary and secondary schools*. London: King's College.

Wertsch, J. (1998). *Mind as action*. New York: Oxford University Press.

White, H. (1981). *The value of narrativity in the representation of reality. In Mitchell WJT (Ed) On Narrative. Chicago,* Chicago University Press.

Whitehead, E. (2006). *Depression.* Retrieved January 10, 2006, from http://www.notmykid.org/parentArticles/LearningDisorder/default.asp.

Wideen, M.F. & Andrews, I. (1987). *Staff development for school improvement: A focus on the teacher.* New York: The Falmer Press.

Wright, R.T. (1999). *Technology education: Essential for a balanced education*. NASSP Bulletin, 83(60):16-22.

Addenda

Addendum A: 1
Letter to the Principal and School Management Team

P.O.Box 262
Ga-Rankuwa
0208

2005 – 01 – 31

The Principal
Modiselle Primary School
P.O.Box 131
Ga-Rankuwa
0208

Dear Sir

APPLICATION FOR CONDUCTING RESEARCH AT SUCCESS PRIMARY SCHOOL

I hereby wish to apply for permission to conduct research at the above-mentioned School. The purpose of my research is to conduct an analysis of how educators integrate ICT in education.

The research will imply the following:

1. Interviews will have to be conducted with previously identified computer facilitators during May to July 2005.
2. Narrative stories of the participants that will be conducted during May 2005.
3. An observation of three educators that will be done in May to July 2005.

Thank you for your attention. Your approval will be highly appreciated.

Yours truly,

Molope S.S.P.
Student Number: 22360647
Med. (CIE), University of Pretoria

Addendum A: 2
Letter of consent for participants

Dear Participant

RESEARCH PROJECT AT SUCCESS PRIMARY SCHOOL

You are invited to participate in a research study. The following information regarding the study is provided so that you are at liberty to decide if you would like to participate. Your participation in this study is voluntary and you may withdraw from the study at any given time should you wish to do so.

Molope S.S.P. undertakes this study. I am a student in my final year of my Masters Degree in Computer Integrated Education at the University of Pretoria. My supervisor is Prof. Blignaut A.S.

My research topic for my final dissertation is on the teachers' experiences in integrating ICT in the school curriculum. The research process include interviews with you as an educator as well as written narrative story about your experiences of integrating ICT in the school curriculum. All activities that you participate in will remain confidential and anonymous. It is my intension to discuss with you the findings before the study is finalised.

Thank you in advance

MOLOPE S.S.P

Addendum A: 3
Letter to the Principal and the Chairperson of School Governing Body

P.O. Box 262
Ga-Rankuwa
0208
31 January 2005

Dear Mr Maringa and Mrs G. Boshielo

RESEARCH PROJECT AT SUCCESS PRIMARY SCHOOL

I am a student in my final year of my Masters Degree in Computer Integrated Education at the University of Pretoria.

My research topic for my final dissertation is on the teachers' experiences in integrating ICT in the school curriculum. I would like your permission to conduct an observation with the three educators; five educators will write me narrative stories about their experiences and finally a focus group interview that will be conducted with the five educators.

The three strategies mentioned above are aimed at gaining data about the following:

- The experiences of teachers in integrating ICT in the curriculum.
- How educators cope with the challenges of integrating ICT in the curriculum.

Kind regards

Molope Salome Sophie Pulane Molope
Student Number: 22360647

Addendum A: 4
Letter of Consent for School

09 February 2005

Molope S.S.P (Miss)
Student Number: 22360647
M.Ed. (CIE) Computer Integrated Education

Madam

re PERMISSION FOR CONDUCTING RESEARCH AT ** SCHOOL

With reference to your request dated 31January 2005 concerning the conduction of a research in the school, the above-mentioned institution grants you the permission to do your research. There are however conditions that will apply, and they are:

- Your research should not in any way interfere with the running of the school.
- In cases of interviews, the school suggests that they be done after school.

Wishing you all the best in your study.

Yours truly

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Dikobe M.J (Principal) Date

Addendum B: 1
Focus Group Interview

I will like you to answer the following questions, which are based on the following topics:

- Topic 1: ICT infrastructure
- Topic 2: ICT professional development
- Topic 3: ICT and the curriculum
- Topic 4: Policies and procedures for the use of ICT
- Topic 5: Strengths and weaknesses in planning and implementing ICT
- Topic 6: Barriers to the successful use of ICT

Interviewer:	Is an ICT infrastructure being developed in the school?
Participant No: 1	Yes, our school has a good computer infrastructure and I think for any education system to make use of ICT, the infrastructure (computers and telecommunications) needs to be developed and extended to all sectors of the education system.
Interviewer:	Is there any relationship between ICT and education?
Participant No: 3	It is my contention that if we can put in place the necessary environment to encourage the use of ICT for learning, we will also provide the platform for development and improvement in our society and economy.
Interviewer	Can ICTs make a difference to development and education?
Participant No: 2	I think the value of using ICT in the schools is best realized when appropriate content is developed and used to enhance and support learning, teaching, administration and management.
Interviewer	Are ICTs being used to bridge or widen gaps or are they creating new ones?
Participant No: 4	I think there is an increment of the divide in the world and that a new gap is emerging, a gap between those with access to information, generally the richer and smaller segment of society, and those with no access to information, generally the poorer, larger portion of society.
Interviewer:	What are the three pre-conditions for a successful introduction of new information technologies into an education system?

Participant No: 5	Well, there is an appreciation by government of the financial resource and operational requirements, a commitment by government to give time and take responsibility for decision-making and implementation strategies, and a commitment to a policy of an integrated support service encompassing teacher and technician training.
Interviewer:	Are these all networked together across the whole school?
Participant No: 1	Yes our computers are networked and learners are able to print or view the documents while they are busy working
Interviewer:	Does the school have access to the Internet? Answer by Yes / No
Participant No: 3	Yes, we do have internet connection and all the stake holders in education are using it at a nominal fee of course.
Interviewer:	If 'Yes', do all students have effective access to the Internet?
Participant No: 3	Yes all the learners do have access to the Internet
Interviewer	Is the school providing for appropriate ICT professional development?
Participant No: 2	Teachers need to understand the application of ICT to support their teaching and administration.
Interviewer:	How would you provide an ongoing technical support
Participant No: 1	The use of ICT in the education system requires different levels of technical support. Policy on using ICT in education needs to identify the levels of technical support necessary and outline how those needs would be addressed. For example, the first line of technical support would need to be based within the school, which requires the training of teachers.
Interviewer:	Has the principal received ICT professional development?
Participant No: 4	Yes he has. He has even registered for the course in ICT with Macro Executives where in a number of programmes were taught.
Interviewer:	Has the school committed any of its own resources to ICT professional development?
Participant No: 2	Yes we do have an ongoing course on Intel Teach to the future
Interviewer:	Do educators have access to computers at any given time or do they use the facility only when they offer tuition to the learners?
Participant No: 5	There is an educator laboratory where educators can do their work while other teachers are busy in the computer lab.
Interviewer:	Has the school found ICT useful in delivering the following curriculum learning areas?

Participant No: 2	ICT on its own has limited uses in the education and training system. Its intrinsic value lies in the integration of the technology to support and enhance learning and teaching in various subjects.
Interviewer:	What do you see the role of computer technology and educational software in the school of the future?
Participant No: 3	From my experience in integrating ICT in the classroom, I think computers and software are tools that provide access to the sources of information from which we learn and become educated and to the most current information.
Interviewer:	What do you think are the benefits of using computers in your school?
Interviewer:	Can the school show that ICT has helped to develop any of the following essential skills? Answer by either Yes / No
Participant No: 1	Communication skills
Participant No: 4	Numeric skills
Participant No: 3	Information skills
Participant No: 2	Problem-solving skills
Participant No: 5	Self-management and competitive skills
Interviewer:	Is the school addressing the issue of inappropriate use of the Internet?
Participant No: 3	We do have a computer policy in the school. As a result we do experience lots of problems with regard to this policy.
Interviewer:	Are there policies and procedures to link school-based learning with the use of computers in learners' homes?
Participant No: 2	Yes, the school has a homework policy wherein parents are encouraged to help their learners at home.
Interviewer:	Has the school attempted to find out how many learners have computers at home?
Participant No: 4	Yes, we did although it is just a small figure of those who have paid.
Interviewer:	Does the school have any policies or procedures to provide access to computers for learners without computers at home?
Participant No: 5	Yes, after school there is a facility where in learners can practice their skills and do homework at the computer laboratory.
Interviewer:	What is the school doing well in planning and implementing ICT?
Participant No: 2	The school has a good quality planning and implementation and integration of ICT in the curriculum is stressed.

Interviewer: What is the school doing poorly in planning and implementing ICT?

Participant No: 2 Our school has a weak point in terms of controlling whether there is quality planning and implementation quality ICT resources and effective professional development

Interviewer: The following points are some of the barriers of successful ICT usage.

- Finance (hardware/software/age of equipment).
- Teacher skills and confidence insufficient professional development (access, time or quality).
- Levels of student skills and confidence.

Participant No: 4 What do you think are the other barriers of ICT implementation?

Interviewer: Theft is one of the problems that is hindering out teaching of ICT in the school.

Addendum B: 2
An example of an Observation Schedule

Changes in Teaching

Indicator: In effective ICT integrated classroom teachers participate actively in the lesson

Critical question: Do teachers participate actively engaged in the lesson?

	1	2	3	4	5
Teachers ask questions					
Teachers are involved in the task					
Teachers listen attentively					
Teachers work cooperatively with each other					
Teachers respond positively in the lesson					

Key

1	Not at all
2	Very little
3	A little
4	A lot
5	A very great deal

Addendum C: 1
An example of a Coded Contextual Analysis

Line No	Quote	Code
18	Foot the bill for conferences	Anger
11	It was financially and physically difficult	Anger
26	The person who was in charge had no insight on ICT	Anger
3	Could not even hold a mouse	Anger
2	I was completely computer illiterate	Anger
12	We tried to instill our vision in their minds but to no avail	Anger
16	Efforts were a drop of water in an ocean	Frustration
6	Change the mindset of Management of the School	Frustration
7	School governing body not for the idea	Frustration
34	There was light at the end of the tunnel	Happiness
36	Life began to be simple and enjoyable	Happiness
13	It will benefit the school in the long run	Hope
25	We approached the North West Department to show them our vision	Hope
4	My learners at school will not experience what I went through	Hope
39	All teachers are computer literate	Pride
40	We have two computer centres	Pride
42	Our school is now a Tele-Centre	Pride
47	Learners are able to participate	Pride
1	I enrolled for FDE (CAE) with the University	Pride
19	Gosh! It was not simple	Sadness