TEACHERS' AND LEARNERS' PERCEPTIONS, FROM FOUR EX-MODEL C PRIMARY SCHOOLS IN CAPE TOWN, ON HOW AND WHY COMPUTERS ARE USED IN THE GRADE 7 CLASSROOM.

by

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A minor dissertation submitted in partial fulfilment of the requirements for the award

of the

Degree of Master of Education

Department of Education

University of Cape Town

2003

Supervisor: Joanne Hardman

This document complies with the formatting standards of the American Psychiatric Association (APA) (1994)

ACKNOWLEDGEMENTS

The completion of this study would not have been possible without the support and guidance of certain individuals.

First and foremost, I would like to express my gratitude and thanks for the time, guidance and encouragement of my supervisor Joanne Hardman whose contributions and consultations made the completion of this research investigation possible.

I would also like to thank Paula Ensor, who afforded me the opportunity of being allocated a National Research Foundation (NRF) grant.

The financial assistance of the National Research Foundation (NRF) toward this research is hereby acknowledged. Opinions expressed and conclusions arrived at are those of the author and are not necessarily to be attributed to the National Research Foundation.

My appreciation goes to Cheryl Friederichs, who spent many hours carefully reading, and rereading this document.

My thanks is extended to the teachers and learners who participated in this study.

Finally, a special thanks goes to all my family for their confidence, love and support. To my Mom and Dad for their support in so many ways throughout the undertaking of this thesis. To my sister Tessa, for her constant encouragement. And particularly to my husband, Sean, who believed in me when I began to doubt myself and who had absolute confidence in my ability to accomplish my goals.

DECLARATION

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in this dissertation, from the work, or works of other people, has been attributed and has been cited and referenced.

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CONTENTS

page

LIST OF TABLES

page

ABSTRACT

The proliferation of computers in education has been studied for many years (Kulik, 1983; Loveless 1996; Underwood & Underwood 1990) including therein a diversity of standpoints from the examination of the effects of the computer on learners to the influence of computers on learning, problem solving and achievement, as well as other aspects of schooling (as cited in Lauman 2000: 2). However, little attention has been afforded to address individuals' perceptions, namely those of teachers and learners, of the technology. Given the great investments by schools due to high expectations concerning the educational benefits of computers, it is important that such research be conducted. The purpose of this study was to investigate teachers' and learners' perceptions from four ex-Model C primary schools, on how and why computers are used in the Grade 7 classroom. The data was collected primarily by means of a questionnaire, which assessed the perceptions of teachers and learners re computer usage in Grade 7, with findings substantiated by observations and teacher interviews.

The study found that: (1) most teachers were comfortable with using computers and expressed positive attitudes towards computer use; (2) teachers agreed that they integrate the computer into the classroom for student-centred learning, independent learning, as a research tool and as a communication tool; (3) teachers view the computer as optimally used for word processing, with importance placed on such skills; (4) teachers believe technology is an integral part of the process of educating their learners; and (5) teachers are of the opinion that their learners perceive the computer to be important, relevant, appealing, valuable, involving and needed. Analysis of the learner data revealed that: (1) learners express enjoyment with using the computer in Grade 7; (2) learners affirm the importance of computers as learning tools; (3) learners perceive that when undertaking tasks they enjoy on the computer they find the computer to be 'entertaining', while the worst thing about the computer is perceived to be 'computer malfunctions' and 'the age of the computer' (i.e. how old the computer was); (4) learners believe the computer has a positive impact on their schoolwork; (5) learners perceive the use of the computer in Grade 7 to be important, interesting, exciting, meaningful and needed; and (6) they feel the computer is used to prepare them for their future.

The findings of this study afford us a glimpse into how a sample group of South African teachers and learners in the ex-Model C primary school context, perceive computer use in the Grade 7 classroom. Further research with larger, more representative samples is recommended in this fairly untouched area of research, particularly in South Africa, as technology continues to take on a more significant role in South African schools.

CHAPTER ONE

INTRODUCTION

The purpose of this introduction is to introduce the research project by identifying the purpose and providing a description of the problem of the study. The significance of the study and the motivation to undertake research in this area is then highlighted. Finally, the organization of the research report is outlined.

1.1. AIM & PURPOSE

The purpose of this study is to explore how teachers and learners perceive how and why computers are used in Grade 7. Specifically, the study is guided by the following research question: "What are teachers' and learners' perceptions, from four ex-Model C primary schools in Cape Town, on how and why computers are used in the Grade 7 classroom?"

1.2. INTRODUCTION TO THE PROBLEM

Knowledge and information have become the driving forces of our global economy. The rapid development of the Internet in the past ten years has resulted in an escalation of the global economy, revolutionizing "the world economy, by enabling information to be collected, analysed and communicated with increasing speed" (Hardman 2002: 4). The technological advances of the 20th century have consequently transformed the way in which the world operates. Every facet of our contemporary lives is assisted by the use of some form of technology. Technology, "has increasingly come to be seen as central to all forms of development, especially economic development" (Muller 2000: 26). Consequently, education is becoming more, not less important in our global world. There are calls for new skills and a new kind of education, stressing knowledge and skill production (Muller, 2000). Educational institutions hence are required to,

> ..prepare learners for participation in an information society in which knowledge is the most critical resource for social and economic development and where distributed

> expertise and networked activities characterize the emerging types of work. (Hakkarainen *et al.*, 2000).

The increasing global emphasis on the importance of technology in education is resulting in a transformation in the conceptualization of educational institutions, paradigms, and practices (Morgan 2001: 2).

With the increasing pervasiveness of computers in the fabric of 'developed' societies over the past twenty to thirty years there has been an increase in computers in schools. Technical innovation has brought "increasingly diverse and more powerful technological tools into schools" (Honey, McMillan Culp & Carrig 1999: 1). This global phenomenon has created a surge within nation-states to develop technology within the curriculum, so as to enable learners to succeed in the 21st century. The introduction of computers into South African schools however, has been slower than many developed nations such as the United States of America where by 1995, the number of computers in schools had surpassed 5.8 million, or one computer for every nine students (Office of Technology Assessment, 1995). A recent survey of South African schools found that only 13 % of all schools in South Africa were equipped with computers, while 87 % of all schools in the country do not have computers (Education Policy Unit 2000: 157). The disparities among South African schools, as a result of the racial hegemony of the Apartheid era, have highlighted the need not only to achieve technological parity with the rest of the world, but equitable distribution of education facilities and learning resources within the country's schooling system. Initiatives are being put into place in South Africa to introduce ICTs into all schools, so as to expand on the "learning opportunities and access to educational resources beyond those immediately or traditionally available, thereby enhancing the quality of learning and teaching" (South Africa 2001: 3). And it is within this context that this study finds itself.

As plans are made for the increased use of technology, it is important for policy makers, educators and researchers to understand how teachers and learners relate and respond to this technology (Martin *et al.*, 1992, in Christensen, 1998). Fullan stated 20 years ago, "educational change depends on what teachers think and do" (Fullan 1982: 107). Consequently the views and beliefs that teachers hold have an impact on the way computers are used in the classroom. It has further been argued that it is necessary to explore teachers' views and attitudes of technology

because "the growth of technology as an instructional tool will depend on teachers' attitudes about these technologies and their ability to use them for instruction and administrative purposes" (Clark 2000: 4). The impact of computer technology on the current and future lives of our learners makes it decidedly important to understand computer technology from their perspective, especially as little research has been concerned with understanding and exploring learners' ideas and perceptions about computers in general, and more specifically, about the ways it is used and could be used in the classroom. Accordingly the ways in which computers are perceived by teachers and learners is of vital importance. This study thus will attempt to explore teachers' and learners' perceptions of computer usage within the South African school context.

1.3. RATIONALE

1.3.1. Motivation

As a Primary school teacher I regard computers as an important part of teaching and learning in the 21st century and wish to establish just how teachers and learners perceive/view the uses of computers in education and more specifically their reasoning as to why they are used. I chose to focus my study on four ex-model C primary schools located in the Southern Suburbs of Cape Town. Since computers form an integral part of their teaching and learning processes I considered the four participating schools to be relevant choices. Consequently I believed it would prove interesting and beneficial to understand just how the Grade 7 computer specialist/allocated teachers and learners in the prospective schools view the uses of computers in education, considering the importance placed on them. It is my hope that this study will afford a better understanding of the perceptions that the sample group of teachers and learners have towards how and why computers are used in education, which will hopefully benefit not only other teachers, researchers and educators, but also the learners who will be learning in those classrooms.

1.3.2. The Significance of the Study

The contribution of this study, as has previously been stated, is that it aims to explore the Grade 7 teachers' and learners' perceptions of how and why computers are used in their classrooms. There is relatively little research on teachers' and learners' perceptions of computer use in the primary school classroom, and even less with a focus in South Africa. The proliferation of computers in education has been studied for many years (Kulik, 1983; Loveless 1996; Underwood & Underwood 1990) with a large focus on the effectiveness of computers in education. However, research is still needed to understand the perceptions of those involved with it in the primary school classroom namely, the teachers and learners. If innovations in educational technology are to be implemented in schools, it is important to understand how this technology is perceived by teachers and learners, as I would surmise similarly to Thurman (1992), that failure to understand the perceptions of teachers and learners could mean that any potential advantages of involving computers in education would never be realized. This study examines the perceptions of teachers and learners in their Grade 7 year within four ex-Model C primary schools. I wish to establish and explore these perceptions.

Given the emphasis on e-learning/computer literacy in South Africa and the current dearth of information regarding learners' and teachers' perceptions of learning using computers, this study seeks to answer the following question:

> What are teachers' and learners' perceptions of how and why computers are used in the Grade 7 classroom?

The question contains two components:

i. Teachers' views on how and why computers are used
ii. Learners' views on how and why computers are used

And further sub-questions:

a) What trends are there from the four schools as to how computers are used?
b) What trends are there from the four schools as to why computers are used?

1.4. STRUCTURE OF RESEARCH REPORT

Chapter 1	Introduction – Statement of the problem and aims of the research
Chapter 2	Literature Review – Theoretical Framework and critical analysis of related Literature.
Chapter 3	Research Methodology – Outline of methodology used to obtain data & data analysis procedures.
Chapter 4	Presentation of Findings & Discussion – Report on the results of the study and discussion of findings.
Chapter 5	Conclusion – Summary of the major findings of the research project, limitations of the study, and recommendations for further research.

CHAPTER TWO

LITERATURE REVIEW

The purpose of this literature review is to provide a theoretical framework for the investigation of teachers' and learners' perceptions of how and why computers are used in the Grade 7 South African classroom. What follows here is a discussion of government policy re educational computing in South Africa; a review of the theoretical nature of computer use in education; and of great significance an overview of the research into teachers' and learners' perceptions and attitudes of educational computing both in South Africa and abroad.

2.1. INTRODUCTION

The aim of this chapter is to explore the various issues surrounding the perceptions of teachers and learners towards how and why computers are used in the Grade 7 classroom. To this end I have examined previous studies, theories and arguments of computer use, perceptions and attitudes towards computers. As this study is concerned with teachers' and learners' perceptions of how and why computers are used in the classroom situation, I have sought to include both local and international studies. In trying to isolate studies which look at both teachers' and learners' perceptions of educational computing, I have located decidedly few. Consequently during the course of this literature review, the studies will be discussed in their independent nature. This dissertation then seeks to add to this underdeveloped body of knowledge.

The last decade has seen a proliferation of computer technology into our schools (Noga 2001: 7). As plans are made for the further augmentation in the use of computer technology in our schools, we need to understand the extent and kinds of teachers' and learners' use of computers, as well as teachers' and learners' perceptions of computer technology in schools (Martin, Heller, & Mahmoud, 1992).

As educational institutions rely increasingly on computers to alter the teaching and learning process, we need to be asking ourselves an important question: "How do teachers and learners

perceive computer use in schools?" Answering this kind of question is often a complex task, but a vital one in our present information age, as millions of Rand are being spent on rolling-out computer equipment in our schools.

The proliferation of computers in education has been studied for many years (Kulik, 1983; Loveless, 1996; Underwood & Underwood, 1990). Such studies have tended to include a diversity of standpoints and areas of focus from describing the effectiveness of computers in education, the influence of computers on learning, problem solving and achievement, as well as other aspects of schooling (as cited in Lauman 2000: 2). When one begins to synthesize the available research, it becomes evident that very little has been done to investigate teachers' and learners' perceptions of computers in education.

The number of computers in education is growing, but with this rapid rate of growth, we should be monitoring how our teachers and learners are feeling about computers in their schools. Why should we be concerned with how our learners and teachers perceive computers in education? To address these critical information needs, I feel a study of this nature is important to conduct. It is axiomatic in saying that as technology impacts on our lives on a daily basis; learners do need to become proficient in the use of technology to be successful in the 21st century. In South Africa, the implementation of Curriculum 2005 requires both learners and teachers to integrate and use technology in the different curriculum learning areas (South Africa, 2002) and without an understanding of how they view this technology and its uses, how can we effectively plan for and achieve the most out of it?

2.2. DEFINING THE KEY CONCEPTS

The terminology pursued in the review and study which follows, requires some conceptual clarification and definition. The following definitions of terms listed, were synthesised from consulted studies and literature.

The concept of **perception** is central to this study and needs elaboration. The New Oxford English Dictionary (2000) entry under **perception** offers the following definition:

- the ability to see, hear, or become aware of something through the senses
- the state of being or process of becoming aware of something in such a way

- a way of regarding, understanding, or interpreting something; a mental impression
- intuitive understanding and insight
- the neurophysiological processes, including memory, by which an organism becomes aware of and interprets external stimuli.
  (NOED, 2000)

While the entry on the verb, **perceive,** offers the general definition of:

- become aware or conscious of (something); come to realize or understand
- become aware of (something) by the use of one of the senses, especially that of sight
- interpret or look on (someone or something) in a particular way; regard as
  (NOED, 2000)

Both entries wittingly allude to both mind and senses. Furthermore in turning to the American ERIC database entry on **perception**, we find a further reference:

> The process of becoming aware of objects, qualities, or relations via the sense organs--involves the reception, processing, and interpretation of sensory impressions (Note: Use a more specific term if possible -- do not confuse with "Attitudes" or "Opinions")
> (ERIC, 2002)

One can discern that the offered dictionary and database definitions do vary slightly in their interpretations for the term **perception**, but what is clear is that all make reference to the *act* of using one's senses to interpret or become aware of something.

While the above consulted sources provide definitions for the key term of this study, it is perhaps more appropriate to consult theorists and related-studies to mobilise the term **perception** for the purposes of this study. **Perception** is one of the concepts which is widely discussed in the sociological and physiological literature. Berelson & Steiner (1964) offer a definition for **perception** as "a process of information extraction by which people select, organize and interpret sensory stimulation into meaningful and coherent pictures of the world" (Berelson & Steiner, 1964 in Britt, 1978). While Thomson & Householder (1995) mobilize the term **perception** in their research, 'Perceptions of technological competencies in elementary technology education', as "where people are". Runyon (1977) puts forth that **perception** is highly influenced by person's interests, beliefs, attitudes and other personal attributes that basically make us individual; hence **perception** is highly 'subjective and selective'. Herein one can see a connection being made between **perception** and **attitude**.

Perception is often confused with **attitude**. While these are closely related, at this point I feel it is necessary to distinguish between them to promote a common understanding and a degree of consensus, in order to arrive at the intended definitions for this study. Kay (1992), in her examination of gender differences in computer attitudes, aptitudes and use, pointed out the confusion inherent in this area of research by the numerous definitions offered for **attitude** (acceptance, affect, cognitions, comfort, confidence, interest, liking, motivation, programming, training, and stereotypes). Other theorists such as, Anderson (1981) defines **attitude** as, "...a moderately intense emotion that prepares or predisposes an individual to respond consistently in a favourable or unfavourable manner when confronted with a particular object" (in Thurman 1992: 20); or Thurstone's (1971) definition "attitude is the affect for or against a psychological object" (Thurstone, 1971). While a selection of definitions of **attitude** is given in the literature, a preponderance of researchers (Ajzen, 1988; Ajzen & Fishbein, 1980; Burns, 1997; Callen *et al.*, 1986; Newby, 1998; Shiverdecker, 2002; Whitrow, 1999) view **attitude** as having three components: the affective, behavioural and cognitive. The affective component refers to "feelings towards a social object" (Whitrow, 1999). The behavioural component refers to "specific actions toward a social object" (Whitrow, 1999). And the cognitive component refers to "beliefs about a social object" (Whitrow, 1999). It is this third component, the cognitive, that creates the link with the concept of **perception**. As Heil (1983) in his book 'Perception and Cognition', alludes "perception is one central constituent of the cognitive domain" (Heil 1983: ix) and elucidates that "perception is best regarded as a linkage connecting beliefs to ordinary physical objects and events" (Heil 1983: 2). Furthermore he attests that "in perception we gain beliefs by way of the senses" (Heil 1983: 4) but points out that "perception, as distinguished from sensation, turns out ... to be always indirect, inferential" (Heil 1983: 5). In this research I shall link up with Gibson's argument that Heil (1983) encapsulates, and that was adopted by Thurman (1992) in his study of the concept of **perception**:

> Perceiving is best regarded as a causal process, one leading from some perceived thing or event to a belief-like cognitive state via a chain consisting of information-bearing physical stimuli and sensory mechanisms. However, and importantly, the having of sensations is not essential to perception.
> (Heil 1983: 137 & 138 as cited in Thurman 1992: 22)

While for the conceptualisation of **attitude** for this study, I shall employ Shaw and Wright's comprehensive definition, based on Allport's (1935) significantly consulted definition (used as a guiding framework for educational researchers (Lehrke *et al.*, 1985; Schibeci, 1985)):

> ...an attitude is viewed as a set of affective reactions towards the attitude object, derived from concepts or beliefs that the individual has concerning the object, and predisposing the individual to behave in a certain manner toward the object.
> (Shaw & Wright 1967: 13)

Reference will be made on occasion in the paper to **ICTs** (Information and Communication Technologies), by which a comprehensive definition is provided:

> ...the convergence of microelectronics, computers and telecommunications which enable the transmission and reception of digital data signals, including text, video and audio. ICTs incorporate the following technologies - *capturing* e.g. camcorders; storage e.g. CD-ROMs; processing e.g. application software; networks e.g. fixed, wireless and satellite telecommunications broadcasting.
> (Morgan 2001: vii)

This is further reinforced by the EPU's concise clarification, "ICTs are those technologies that enable the handling of information and facilitate different forms of communication" (EPU 2000: 12).

I will be referring on occasion in the paper to the term **technology,** by which a definition is offered by the NCREL: "in education, a branch of knowledge that deals with the creation and use of technical tools or instruments" (NCREL, 2000). A further theoretical perspective offers the following clarification, "technology, includes both a product, a tool, as well as the process of using the tool" (Peck & Dorricott, 1994). For the purposes of this study, the most important educational technology is taken to be computers, for the reason that Thomas & Emereole's (2002) definition offers a justifiable delineation:

> Though technology may include several devices such as the overhead projector, the motion picture, the radio, the television and the computer, the term technology as used... (in this paper)... refers mainly to the use of the computer as a teaching and learning tool because of its versatility in today's classrooms, the capability to converge the salient features of all its forerunners, and the promise to maintain its current unique status unabated in future.
> (Thomas & Emereole 2002: 97)

Senior Phase refers to the third phase of schooling Grades 7-9, which forms part of the new structure of Curriculum 2005. This term will be used to further describe the phase in which the sample group of learners are involved.

In discussion of computer use in education, reference will be made on occasion to different approaches to learning. A clear definition is offered by Shields & Behrman (2000) for the purposes of this study. The traditional **transmission** approach to learning "relies primarily on books and lectures to impart knowledge, while students are mostly passive and expected to memorize and recite what they have learned" (Shields & Behrman 2000: 19). In contrast, a **constructivist** approach to learning "focuses more on cultivating student interest through critical thinking and real-world applications and often involves problem-solving in small groups" (Shields & Behrman 2000: 19).

Leaders in learning research (Piaget, 1977; Vygotsky, 1978) have shown that learning "must involve activity on the learners' behalf" (Hardman & Ng'ambi 2003: 6). Roschelle *et al.* (2000) affirm that positive results from computer use are most likely to be achieved when applications reinforce one or more of the four fundamental characteristics of learning that underpin the 'constructivist' approach (in Shields & Behrman 2000: 20):

- active engagement
- participation in groups
- frequent interaction and feedback
- connections to real-world contexts

According to learning research, such an approach is better matched to how children learn than the 'transmission' approach. Educational technology software designs typically, "assume that learners get the most out of them if they, the learners, transact with the environment in order to construct knowledge" (Hardman 2002: 5). Such activity-based software is located in a constructivist paradigm.

2.3. EDUCATIONAL POLICY

2.3.1. ICT Policy in South Africa

This section sets out the policy of the South African Government apropos computer technology in education. The context within which ICTs operate in South Africa is laid out through the following key policy initiatives: (Hardman, 2002)

- The White Paper on Telecommunications intends to supply 3 million telephones over the next 6 years, for every school, clinic, hospital, post office, library and police station. The resultant connectivity will facilitate schools' access to the Internet and in turn afford teachers and learners the use of hypermedia (Czerniewicz, 1999).
- The Science and Technology White Paper (1994) and the Telecommunications Policy (1996) highlight the significance of mathematics, science and technology skill development in South African learners.
- March 1998 saw the South African Government mandate a 3-year IT strategy with the intention to put a fibre-optic network in place in South Africa.
    - The South African Telecommunications Regulatory Authority (SATRA) has been instituted as a "regulatory framework and mechanism for the spread of ICTs" (Hardman, 2002).
    - The Western Cape Education Department's (WCED) policy for Educational Technology (1997) reveals that differential access to computers is resulting in an increasing 'digital divide' between technological haves and have-nots. The need to redress equity and access issues is identified in their mission statement objectives:

        > To facilitate the use of appropriate educational technology in order to improve the quality of teaching and learning; to prepare learners adequately for a career world in which technology plays an important role; to address the social problems of our time and offer redress for past inequalities; and to promote educational change and rejuvenation. (WCED, 1997)

Furthermore, the 3-year curriculum development programme known as the Technology 2005 project which constitutes a critical element of Curriculum 2005, proposes to develop:

- A national curriculum framework for technology education in the compulsory school phases.
- Appropriate pre- and in-service teacher education programmes in technology education.

- Systems for the implementation and evaluation of the Technology 2005 project in participating provinces
  (JET 1997: 6)

2.3.2. Curriculum Policy in South Africa

It is at this point that the recent curriculum policy initiatives in South Africa need be expanded upon, so as to understand the context in which this study finds itself.

In the wake of the abolishment of apartheid, to address the previously promoted inequality, the South African education system has been subject to a series of changes, which have sought to reconstruct the field in multifarious ways. New policies and programmes, intended to address the country's fundamental educational concerns of the former system's grievous legacies, have been introduced, which have been lodged clearly and consistently within powerful economist rationales (Muller, 2000). Accordingly one could say that one of the main forces behind recent education policies is economic globalisation. Within this framework, changing education is considered a pre-requisite for economic growth: outcomes-based education is intended to develop citizens who can compete successfully in international markets; while science and technology education is prioritised as the subject fields that will foster economic development (Muller, 2000). A component of the restructuring of the South African education system has been the attempt to fall in line with international technological developments. The Government aims to develop the use of ICTs in schools in order to align the nation with the outside world. This was reaffirmed at the 14th Conference of Commonwealth Education Ministers: "One of the most important opportunities of global era will be to harness the positive capacities of new technologies in Education" (South Africa 2000: 56).

The Education White Paper 1 (1995) and the South African Schools Act (1996) have been influential in "shaping the policy environment for the funding, provision and use of computer technology in schools and will have to provide the basis for development and implementation of future strategies" (Morgan 2001: 12). The convictions and objectives for education as expressed in these two documents are systematically summarised by the EPU (2000) below:

- Providing quality education for all.

- Developing democratic, well skilled citizens to contribute to the economic growth of the country.
- Right past inequities by providing for new learning/teaching strategies including therein access to and equitable distribution of technological resources.
- Focus on learner-centred, outcomes-based approaches to education, with the following shifts envisaged:

  > From content-based to outcomes-based education; from passive to active learners; from summative to formative (process) assessment; from teacher-centred, textbook-embedded education to learner-centred pedagogy; from a focus on rote learning to critical thinking; facilitating life-long learning; developing problem-solving and creative environments through the use of new technologies; and integrating technology across various contexts in order to reach these goals.
  >
  > (EPU 2000: 53)

Within the schooling system, one of the most significant reform developments was the, "radical departure from apartheid education through an outcomes-based curriculum reform, C2005" (Cross, Mungagi & Rouhani 2002: 171). The introduction in 1998 of Curriculum 2005 (C2005), incorporated the very principles outlined in the aforementioned papers, but failed due its "radical form of learner-centeredness" (Hardman, 2002), as it proved a disservice to the very learners it had hoped to aid. The pre-eminent task of the Review Committee of C2005 was to understand why and in the process, set out to consider a more suitable approach. They established that C2005 was over-designed and had "no conceptual road map" (Muller 2002: 10). In South Africa the old Apartheid regime failed to create a link between official knowledge and knowledge of everyday life. C2005 attempted to integrate the two, yet fore-grounded the everyday at the expense of the conceptual knowledge (Taylor, 1999) and in doing so negated the sequencing, pacing and progression requirements of gateway subjects such as language, mathematics and science. The consequence was that learners' progression was stunted (Hardman, 2002).

Subsequently after much deliberation, consideration of the Review Committee's suggestions and opening the platform up to public comment, the Revised National Curriculum Statement for Grades 1 to 9 has been finalised wherein the learning and evaluation requirements are explicitly mapped out. It is against this policy background that my research study finds itself today.

Educational reformers appear to agree with the theoreticians and experts that to enhance learning more attention should be given to actively engaging learners in the learning process (Roschelle *et*

al. 2000: 79). Curricular frameworks, such as The New National Curriculum of South Africa, now expect learners to take active roles in solving problems, communicating effectively, analysing information and designing solutions – skills that go far beyond the mere recitation of correct responses. The characteristics of computer-based technologies (i.e. interactive learning experiences; collaborative learning; 'real world' learning; and images (Hardman 2002: 5) make them a particularly useful tool for this type of learning – active, constructive learning (Roschelle *et al.* 2000: 79).

2.4. THEORETICAL NATURE OF COMPUTER USE IN EDUCATION

Perceptions of computer use in the first year of the Senior Phase, Grade 7, remain the primary focus of this study. To this end it is necessary to look to what the theory says about its uses in education.

The domain of computer use in education rarely precedes the debate of where to locate them. The literature sets forth the controversial variable of the environment for learner instruction in computers - computer lab versus classroom setting. Traditionally, computers have been placed in laboratories staffed by computer specialists, which remains a strong trend in a large percentage of South African schools (EPU, 2000). "Integrate, don't isolate computers" (Davis & Shade, 1994) represents the current position on where and how to use computers in schools. According to the authors, the practice of the computer lab "has undermined the most valuable aspect of the computer – its ability to cut across traditional subject boundaries as a practical and useful tool". Further proponents of this view, Fowler (1990), Junaid (1996) and Watson (1990), "argue that the use of computers within classroom settings is superior to computer labs in promoting an integrated curriculum and maximizing the benefits of computer usage to improve learning" (Rule *et al.* 2002: 2) . The renowned researcher on children and computers, Seymour Papert (1981), argues that computers should be integrated into the curriculum and that,

> ...computer labs are not integration across the curriculum they are integration across the hall. As such, they isolate the computer and make it (a separate) part of the very curriculum it should be supporting.
> (in Christensen 1998: 12)

He further adds that by isolating computers from the classroom and placing them in a computer lab, schools are turning the technology into "a separate, unrelated subject area called 'computer literacy' ". In 1990 Shade & Watson concluded that only when computers are integrated into the curriculum and into the daily classroom as a "vital element for instruction and are applied to real problems for a real purpose, will children gain the most valuable computer skill – the ability to use computers as natural tools for learning" (in Davis & Shade, 1994). A minority of researchers currently see computer labs as beneficial to classroom instruction (as stated in Rule *et al.* 2002: 2). It has been suggested by Federico (1995), the need for computer labs to supplement instruction though through: "(a) increased time in using computers for vicarious development of skills; (b) supporting students who may benefit from more individualized help; and (c) as a way to decrease school truancy" (Rule *et al.* 2002: 2). Additionally Rule *et al.* (2002) highlight the importance for determining the most effective uses of computer labs.

The Impact2 (2000) study indicates that there should be both a computer laboratory as well as a computer in each classroom. They suggest that the computer laboratory should be available for research or project work after official school hours, while classroom computers should be used frequently throughout the school day across all subject areas (Hardman 2002: 11) and that learners should have access to computers for at least 1 hour per week for optimal learning outcomes. The West Virginia's Basic Skills/Computer Education State-wide initiative programme argues that learners who have access to computers in their classrooms outperform learners who are taught solely in a laboratory setting (in Hardman 2002: 14).

In focussing on the use of computers in schools, Taylor's (1980) framework affords a valuable foundation, as he suggests that computer use in schools can be classified in three ways: tutor, tutee or tool (in Anderson 1991: 39). The role of the computer as a *tutor* involves a tutoring system where the learner is guided by the computer. Programs include drill-and-practice software and tutoring systems. When the computer functions as *tutee*, the learners primarily control and direct the computer through the use of programming languages such as LOGO and Visual Basic. The computer as a *tool* has a variety of purposes "which have the common characteristic of developing a flexibility of thought" (Underwood & Underwood 1990: 4), as the computer assists but does not direct the learning process. Tools include software programs such as word processing packages, spreadsheets, databases, presentation software, desktop publishing;

CD Rom based encyclopaedias and the World Wide Web. These can be applied to a wide variety of educational activities.

Research abroad by Becker (1993) indicates that learners at primary school level use computers exceedingly in an exercise mode, doing drills and playing an assortment of educational games, rather than in a productive mode. Furthermore an Office of Technology Assessment (1995) report established that the most common use of computers in primary schools was proven to be basic-skill practice. By the same token, many schools in South Africa are still focussed on drill and practice methods rather than approaches which enable learners to develop thinking and problem-solving skills (Paul, 1999). This forms part of the central debate concerning the use of the computer in schools: computer as 'teacher' (tutoring/drill-practice approach) versus the computer as 'tool'. A recent study to investigate the nature and extent of ICT provisions in South African schools was conducted by the Education Policy Unit of the University of the Western Cape. On indicating the purposes for which computers are used in the different grades, the overall responses for Grades 1-7, revealed that drill and practice followed by problem-solving exercises were seen as the most important (EPU 2000: 84). While research literature reflects that predominance has been placed upon drill and practice usage in schools, with the advent of the Revised National Curriculum the picture in South Africa should start to improve, as ICT is being promoted in various ways in the different learning areas. For example:

- spreadsheets in Mathematics, Economic and Management Sciences.
- Word processing (needed in all learning areas)
- Database management (skill needed mostly by Social Sciences, Economic and Management Sciences)
- Graphics (skill needed mostly by Arts and Culture, Technology, Languages, Social Sciences)
- CD-ROM referencing (needed by all learning areas)

(South Africa 2002: 7)

This falls in line with Papert's (1981) argument against the use of the computer as a drill-and-practice machine, suggesting that the computer as a tool can "open up new fields of knowledge and encourage the development of higher-level cognitive skills" (in Underwood & Underwood 1990: 24). Furthermore he discerns that the computer should be acknowledged as a tool for learners to use to "create their own knowledge and introduce them to the process of intellectual inquiry" (Papert 1980, 1993 in Berg *et al.*, 1998). "In encouraging children to use the computer

as a tool, we are building upon out-of-school uses of the computer, with children participating in activities relevant to such environments as the electronic office and engaging in an exploration of knowledge" (Underwood & Underwood 1990: 24). We should be developing holistic learners who will evolve into competent and independent critical thinkers in this technologically centred millennium. It is also argued by Roschelle and colleagues that when computer-based technology integrates: active engagement; participation in groups; frequent interaction and feedback; and connections to real-world contexts (essentially constructivist principles), into the learning process, "it can be an effective tool in helping students learn higher-order skills involving creative or critical thinking about complex ideas" (in Shields & Behrman 2000: 20). Furthermore Druin & Solomon (1996) argue that computers offer advantages that traditional learning materials cannot provide, "such as interaction where children can make choices, and feel in control over their learning" (in Vogelzang 1996: 6). Papert also states that "the computer is able to keep pace with the child's intellectual level, and this offers advantages over print, or other non-interactive media" (in Greenfield, 1984). 'What should we be doing with computers in the classroom?' will therefore continue to remain at the forefront of educational debate.

It is also important when discussing educational computing that we consult the theory as to reasons for using computers in education. The nature, the potential and the importance of the role that the computer has come to play in the classroom has been justified through the recognition of multifarious sets of objectives, philosophies and perspectives, i.e. different rationales.

Hawkridge (1990) identified and outlined four fundamental rationales for the use of computers in schools: the social, vocational, pedagogical and catalytic rationale. The *social rationale* argues that learners need to be aware and unafraid of how computers work as computer technology pervades the society in which we are living. Whereas, the *vocational rationale* stipulates that learners should be able to operate computers to ensure future employability. The *pedagogical rationale* suggests the idea of using the computer as a tool to improve teaching and learning, therein including simulations and tutorial programs which can replace costly scientific equipment. And finally, the *catalytic rationale* is based on the belief that computer use can change what one teaches, therein involving a reorientation from "rigid curricula, rote-learning and teacher-centred lessons" (Hawkridge, 1990) to a more child-centred, open approach to

teaching and learning, which in turn will enable learners to become more independent. Constructivist learning theories (such as Piaget 1977) indicate that active construction of learning ensures learning (See before, p. 13).

While these rationales may create some debate, there is no doubt that educators have their own sets of beliefs, ideas and justifications for the way they use computers in their classrooms, and such rationales are often found to be reflected in their perceptions and practices.

2.5. EFFICACY OF COMPUTERS FOR MOTIVATION, ACHIEVEMENT & LEARNING

2.5.1. Motivation

Research findings in the area of motivation of learners engaged in computer-based activities, are important in that motivation is found to impact on learning (Ungerleider & Burns 2002). O'Hara (1998), in a study of the attitudes and behaviours of a group of 5th grade learners using the internet, observed increased motivation for and focus on the learning task (in Bennett & Lockyer 1999: 5). Several other researchers have reported increased motivation as the most common effect of working with computer technology on learner behaviour (Cox, 1997; Follansbee *et al.*, 1996; Richards, 1996; Trentin, 1996). Some explanations of this increased motivation (adapted from the National Council for Educational Technology, 1997) include:

- Computers have the flexibility to meet individual learner needs.
- It can be used to present information in new ways which help learners understand more readily.
- It can give learners the power to try out different ideas and to take risks.
- It can make learners more confident and able to challenge themselves more.

(in Murphy & Greenwood 1998: 414)

Furthermore Ungerleider & Burns (2002) cite multiple research studies that provided repeated evidence that learners using computers are highly motivated to complete tasks using computers. It is recognised that Ungerleider and Burns are located within a specific research tradition that privileges post-positivist experimental research designs. However, it must be noted that current trends in researching educational technology, especially within schools, are increasingly pointing to the use of a more qualitative methodology to account

for the processes underlying motivation in computer engagement (Reeves, 1995). Indeed, as "concerns have been raised, that such increases in motivation may arise from the novelty of computers in the classroom and therefore may be unsustainable in the long term" there is a need to carry out more in depth qualitative studies in this area (Bennett & Lockyer 1999: 5). In contrast to such a concern two studies, one by Chessler and colleagues (1998), The Microsoft-Toshiba Laptop Pilot Program, reported that high levels of enjoyment and interest were maintained through the second year of the programme and another by Sandholtz *et al.* (1995,1997) in their 6 year study of learner engagement in technology-rich classrooms, established that "engagement was increased and sustained under conditions which encourage appropriate, curriculum-wide use of computers as tools" (Bennett & Lockyer 1999: 6). While such results give an indication of learner motivation being increased and maintained through technology-supported activities, Bennett & Lockyer point out further research is still needed to develop a better understanding of the circumstances under which this occurs (Bennett & Lockyer 1999: 6).

Studies such as Apple Classrooms of Tomorrow (Dwyer, 1994) and West Virginia's Basic Skills/Computer Education State-wide Initiative's findings suggest that computers improve learners' motivation. Furthermore, the ETS National Study of Technology's impact on mathematics achievement carried out in America with 4th through 8th grade learners indicates that "computers can enhance learners' academic performance" (Hardman 2002: 2).

2.5.2. Achievement

A number of large comprehensive national studies have investigated whether access to a computer or use of a computer in instruction improves academic achievement (Ungerleider & Burns 2002: 4). Tremblay, Ross & Berthelot (2001) refer to a study by Statistics Canada in 1997 involving 115 000 third graders, which found no relationship between the presence of a computer in the classroom and the achievement of the learners (Tremblay *et al.*, 2001 in Ungerleider & Burns 2002: 4). A study involving American learners (Grades 4 and 8) have reported similar findings, by looking at the results of the National Assessment of Education Progress tests, which includes assessment of the effect of computer use on academic

achievement (Johnson, 2000). Essentially, learners who used computers in the classroom at least once a week did not do better on the NAEP reading test than those who used computers less than once a week (Johnson 2000 in Ungerleider & Burns 2002: 4). On the other hand there are "some indicators of a positive effect of computers on academic achievement" (Ungerleider & Burns 2002: 6). A study by Renaud (1998), who looked at science performance of 7th grade low achievers, found positive relationships between computer use and achievement as a result of exposure to computer assisted instruction. Furthermore van Daal & Reitsma (2000) revealed marked increases in reading and spelling achievement of kindergarten learners who were exposed to a computer-based reading and spelling program over those not exposed to a computerized program (in Ungerleider & Burns 2002: 6). Some other studies also found similar conclusions (Zywno & Waalen, 2001). While research has also gone on to show the positive effects of computers on student performance it is "difficult to interpret these findings in light of the null or negative effects reported in the Canadian and American studies using large-scale student assessments" (Ungerleider & Burns 2002: 6) as mentioned earlier. It is suggested by Ungerleider & Burns (2002) that more carefully developed and realized experimental research is needed before conclusions can be gleaned.

2.5.3. Metacognitive Learning

Metacognitive knowledge includes "knowledge about the self, the task, and strategies for learning" (Ungerleider & Burns 2002: 9). While memory and problem solving skills play a role in the effective use of metacognitive competencies, the development and realization of successful metacognitive skills can remarkably influence learning and academic performance (Ungerleider & Burns 2002: 9).

Group work is acknowledged as one of the principal domains where computer use can add to established practices (Ungerleider & Burns 2002: 9). Such grouping of learners around a computer, as opposed to working in isolation at individual computers, is documented as having a positive effect on performance (Inkpen, 1997; Lou *et al.*). Others point out that using technology to promote collaborative activities can be a powerful motivator and can lead to better learning than relying on individual work (Roschelle *et al.* 2000: 80) because "the degree to which classrooms are socially active and productive" can be enhanced by such uses and "can

encourage classroom conversations that expand students' understanding of the subject" (Roschelle *et al.* 2000: 80). The extent of group effectiveness, in the 9-12 age group is governed by a number of determining factors, "including the degree of autonomy developed by students, type of negotiation within a group, and the extent to which pupils appropriate the task (Hoyles *et al.*, 1992 in Ungerleider & Burns 2002: 10). Further studies lend credence to this claim, with Kinzie, Sullivan & Berdel (1992), reporting a positive effect of autonomous learning on performance. However, it has been found (Clark, 1997; Gillingham *et al.*, 1989) that too much autonomy can be disadvantageous to the performance/learning of the pupils, because the activity assigned has been shown to dictate where more or less autonomy is desirable, while Adnanes & Ronning in their 1998 study found that secondary learners took more responsibility and worked more independently when afforded considerable autonomy.

Computer-assisted instruction (CAI) has been one of the foremost technological endeavours to encourage the use of *memory* strategies (i.e. rehearsal) in learning. However it still remains unclear as to whether CAIs are successful at augmenting achievement (Coley *et al.*, 1997).

There remains a prevailing debate that using computers makes pupils "better *problem solvers* and autonomous learners by encouraging the development of independent thinking skills beginning as young as pre-school" (Scherer, 1989; Wheeler & Regian, 1999 in Ungerleider & Burns 2002: 11). Furthermore Margoulis (1988) and Hasselbring & Moore (1996) offer limited support in this area due to their studies' absence of either a control group or differences of sizes between experimental or control groups. Though the results gleaned that games can be stimulating to learning and problem-solving (Margoulis, 1988), and mathematical environments were found to help first to third grade learners with problem solving in mathematics (Hasselbring & Moore, 1996). While research is still divided in this area we might conclude however that computers do indeed appear to have the potential to impact positively on learning.

2.6. PERCEPTIONS & ATTITUDES

Much of the research about teacher and learner perceptions towards computers in education centres around studies conducted in the United States of America and the United Kingdom, where computers in education have played an integral part of such curricula since the early

1980's. Such studies have tended to focus on teachers' perceptions and learners' perceptions independently, as will be evident from many of the studies consulted below. I have consequently found a need for my study to focus on both teachers' and learners' perceptions, as I would surmise each may influence the other.

2.6.1. Teacher Perceptions

As computers are forming an integral part of the classroom in the 21st century, teachers' perceptions and attitudes should be continually monitored. According to Akyurekoglu (2000) there has been little research about teachers' perceptions of using computers. He recognizes that "without a clear understanding of teachers' perceptions of these new technologies, it is very difficult how to place them in a classroom" (Akyurekoglu, 2000).

It can be argued that if computers are to be more widely used in education, the realm of teachers' perceptions of their uses should be explored first. Thurman stresses that, "failure to understand the perceptions of practising teachers would mean that any potential advantages of involving computers in education would never be realised" (Thurman 1992: 6).

As Fullan stated 20 years ago, "educational change depends on what teachers think and do" (Fullan 1982: 107). Consequently the views and beliefs that teachers hold have an impact on the ways computers are used in the classroom. A response by the EPU supports such notions that teachers' attitudes and perceptions towards the use of computers in teaching and learning are "especially important to consider in developing the capacity of a school to use ICTs effectively" (EPU 2000: 149).

2.6.1.1. International Studies

Drenoyianni & Selwood (1998) have found that British teachers differ in their perceptions and *use* of computers in the classroom. Their study of 37 primary school teachers for six United Kingdom primary schools illustrates the following: a high percentage of teachers (67 %) saw their major rationale for using computers in the classroom as the development of computer awareness and viewed their role as non-intervening. While 43 % of teachers maintained that the use of the computers in their classrooms was to support learning and teaching with their role (the

teachers) viewed as an intervening one (in Mumtaz 2001: 350). These two broad patterns of reasoning for computer use (computer awareness and support for learning) were also identified in the Canadian Microcomputers in the classroom project (Eaton & Olson, 1986). Similarly, Underwood (1988) in his analysis of British teachers' declared aims for using computers, confirmed the rationale of giving learners an awareness of what computers can do (in Underwood & Underwood 1990: 6). Findings demonstrated by Jackson *et al.* (1986) in their study of microcomputer *use* and provision in primary schools, revealed that the dominant educational goals for using computers were to reinforce work that takes place in the classroom and to *motivate* learners, with predominance here too, centred on familiarising learners with computers. Similarly, Dunn & Ridgway (1991a, b) in their investigation, this time of student teachers' experiences with computers in the primary school, revealed that computers were used to develop basic skills and concepts, motivate, promote the development of learners' communication skills and reinforce computer skills.

In a research study by Berg *et al.* (1998), teachers were asked to rate 39 uses of technology on two dimensions: importance and frequency of use. The highest rated item on importance was to "motivate and keep learners interested and experiencing success", while the lowest rated item was found to be "my students use Lego, Lego Logo or Lego Dacta". Teachers' reasons for frequent technology uses were "to change from the traditional classroom to motivate students and to be more creative in designing assignments" (Berg *et al.* 1998: 4).

Teachers' beliefs about why they use computers in their classrooms are further cited by Ertmer *et al.* (1999). Five main reasons were alluded to by the participating teachers: 1) computers were exciting and motivating for their learners; 2) learners needed to use technology to be prepared for the future; 3) technology made their lessons more interesting to learners; 4) technology enabled them to reach learners with learning or attention problems; and 5) using technology enabled them as teachers to become more competent as they enjoyed computers (Ertmer *et al.* 1999: 11). Similarly in Davidson & Ritchie's (1994) study, teachers agreed that using technology enhances teaching, motivates learners, and improves learner performance. While corresponding research done by Reed (1986) identified three foremost rationales (as stated by teachers) for using computers in schools: a) learners who had the opportunity to use computers in school would be

more functional in the workforce, b) computers improve and enhance student learning, and c) computers can be used to help teachers in instructional management (in Shiverdecker 2002: 24).

As far as the Leeds Local Education Authority investigation is concerned, the sample of teachers surveyed during the academic year 1996/1997 identified the following perceptions of computer use in education: 1) computer use benefited learners through presentation of their work (37 %); 2) computers were a powerful motivator; 3) the quality of students' work was believed to have improved through the use of computers (80 %); 4) while any negative effect on students' work were nominally considered (15 % of respondents) (Cuthill, 2001). Interestingly, the factor of motivation was also to be a significant finding of the five year long survey research of 8000 teachers and principals in the United States of America. Bracely (1993) outlined that computer-using teachers perceived computers as,

> ...helping students to enjoy their school experience more and motivating them to pay attention to academic work. Four out of ten believed that student enthusiasm in school subjects for which they use computers was 'much improved' because of computers... Drill and practice was seen as beneficial to lower achieving students.
> (Bracely 1993: 75)

One can conclude from the above studies that computer technology is seen by the participant educators, as a large motivational factor for learners.

A further qualitative study by Clark (2000) to investigate urban middle school teachers' perspectives of the use of instructional technology, revealed most teachers felt confident in their ability to use technology; believed technology was an integral part of the process of educating their students; and believed their classrooms needed more technology. In contrast research by Hogarty & Kromrey (2000) involving teachers in the Pinellas County Schools to measure critical aspects related to the use of technology in schools, revealed the most differences between their study samples on the items pertaining to comfort and efficient use of computers during classroom instruction and the enhancement of teaching and learner performance (Hogarty & Kromrey 2000: 10).

Academic goals and benefits are an important aspect when ascertaining teachers' perceptions of computers. A survey of 54 primary school teachers by Gower (1992) explored teachers' beliefs about the *benefits* which result from the use of Information Technology. The data revealed that

52 % of the teachers maintain that the benefits of IT use is in developing low level cognitive skills, with 33 % indicating high level cognitive skills, while a further 30 % maintaining personal skills and only 17 % seeing it as developing social skills. This data supports the view from earlier research into what teachers believe IT is good for: to develop technical, rather than conceptual skills (in Olson 1988: 61). In the same vein Drenoyianni & Selwood (1998) established that developing learning strategies and problem-solving abilities (89,1 %) was teachers' primary academic goal, followed by basic skill and concept development (55,1 %) and the development of social skills.

Passey & Ridgway (1992) identified teachers' perceptions about the *uses* they saw for computers. From the sample of 66 teachers they found that the most frequent single response was to perceive IT as an administrative tool, while only 46 responses related to educational uses. 16 responses were focussed on computer use as a teaching tool, while 14 responses referred to skill development. Only 12 responses were interested with the support that IT can offer for learning (in Olson 1988: 63). A further study by Akyurekoglu (2000) on the perceptions of teachers at Miami Shore/Barry University Charter school of using computers in their classrooms as tools, revealed that teachers viewed computers as teaching, classroom management and communication tools. Furthermore numerous studies situated in the 1980's, just as research in computers in education started to evolve, have shown that a number of teachers view computer use as a worthwhile tool for teaching (Djooya, 1986; Manarino-Lettett & Cotton, 1985; Woolsey, 1985), while others consider computers a threat to their role as educators (Callister, 1986; Moskowitz, 1984). The literature would suggest that the computer is also perceived as a significant information resource. Findings from the Teaching, Learning and Computing Survey conducted by Becker (2000) established that teachers' primary objectives for computer use by learners was to get information or ideas (51 %), with 44 % viewing it as a way to express self in writing, with mastering skills and computer skills coming in with 37 and 32 % respectively. Australian studies, Fitzgerald *et al.* (1986) and Kershaw & Cousins (1990) conceded that teachers perceive computers are advantageously used as an information source, and subsequently used for word processing and administrative tasks. While on the factor of the 'different uses of computers in a classroom' Kershaw & Cousins (1990) study, post-introduction of computers into

the classroom settings, revealed that teachers ranked problem-solving as the best use of computers in the classroom, with drill and practice ranked last.

Additionally, studies in the literature dealing with *obstacles* that educational practitioners perceive as major impediments for realising their school based ICT objectives, also requires consideration. Certain characteristics of classrooms and schools, such as equipment, time, technical assistance and leadership, may act as either barriers to or facilitators of technology use (Smerdon *et al.*, 2000). Pelgrum's (2001) study of a representative sample of teachers at the lower secondary level from 26 countries concluded that the major perceived obstacles were: lack of computers and lack of knowledge among teachers. In the same light Kershaw & Cousins (1990) Australian study concurs that difficulties encountered related to insufficient funds for the purchase of computers and not enough computers in the classroom. These appear to be among the long standing concerns of teachers (Fitzgerald *et al.*, 1986).

The change of teachers' role in the classroom when using technology is also mentioned in a number of studies (Clark, 2000; Gay, 1997). Gay's Doctoral Dissertation (1997) revealed that teachers acknowledged that using technology in lessons created a change in their role in the classroom towards one of facilitation. This is also pointed out by Clark (2000) that when technology is introduced into the classroom, "the teachers' role can change from the information source to the facilitator of the information" (Clark 2000: 3). Similarly, in the qualitative evaluation of a school-wide computer implementation project, Keeler (1996) found that teachers reported a change from teacher-centred to student-centred instruction, with their role becoming more supportive, as they were facilitating student learning, while their students became active participants in the learning process (also alluded to in Bennett & Lockyer 1999: 22).

Hoffman *et al.* in 1995 found, "The level of *experience* and *educational level* of teachers are among the most important factors that shape and affect teachers' perceptions of computers in teaching" (in Akyurekoglu, 2000). Increasing teachers' competencies in the area of computers in education is a vital aspect if it is to be successfully implemented in the schools. The U.S.A. Congress of Office of Technology Assessment asserts that:

> Helping teachers use technology effectively may be the most important step to assuring that current and further investments in technology are realized.
> (OTA 1995: 2)

2.6.1.2. South African Studies

In contrast to the different International studies, South African primary school teachers' perceptions towards computers in education have been nominally considered. The importance of computers in education in South Africa has only recently, in the last decade, arisen as a significant issue in schools. Despite the central role of the teacher in educational applications of technology, there has been relatively little research on South African teachers' perceptions of how and why computers are used in the classroom. With the transformation of the National Curriculum, a new emphasis has been placed on technology in education, in the aspiration of aligning our country within a global arena.

In 1997 the National Centre for Educational Technology and Distance Education, identified the need for the development of clear and comprehensive policies for addressing the development of ICT capacity in South African schools. Consequently a national survey on Computers in Schools was undertaken. What emerged from the essential findings was that the feelings of teachers at schools with computers, towards the use of computers in education, are generally positive "with few concerns being expressed regarding possible negative effects such as … computers have little value in teaching and learning" (EPU 2000: 109). Two views widely held by respondents included: "Computer skills provide learners with greater job opportunities; and computers help learners to think and work independently" (EPU 2000: 99). Perceptions of teachers at schools without computers, also pointed to positive feelings about the value of computers in schools, which surpass any negative feelings. Similarly, these teachers saw computers as "providing an environment for independent work and thinking among learners, as well as giving them greater job opportunities" (EPU 2000: 120). The exploration of teachers' perceptions towards the use of computers in teaching and learning is "especially important to consider in developing the capacity of a school to use ICTs effectively" (EPU 2000: 149).

While international studies lead in terms of research on teachers' perceptions of computers and its uses, a Master's dissertation conducted in South Africa by Thurman (1992) to identify and analyse high school teachers' perceptions of computers and their uses in education revealed the following:

- Teachers were positive about the general concept of computers and their use in education;
- While in favour of the use of computers, teachers were not ready to teach about them, or use them in their classrooms with their learners;
- The computer was favoured more as a management tool than as a medium of instruction;
- There was a considerable diversity of knowledge and awareness among schools, as to just how their computers were used;
- A significant number of teachers found computers valuable and used them regularly for their administrative purposes;
- While 94.9 % of teachers were interested in learning more about how to use a computer.

(Thurman 1992: 1)

A further M.Ed study by Mostert (1992) examining the use of computers in South African Primary Schools revealed that the computer was seen by the teachers as an extra subject and had not yet led to any significant changes in teaching styles and methods, despite a high level of computer usage at the sampled school.

What one must bear in mind though is that 10 years have elapsed since such studies and the situation in South Africa with regard to computers in education is a very different one. Much of the past research cannot be considered relevant in its analysis of now outdated computer technology, nor to the present South African education system which has since changed from the old methodological emphasis on "Fundamental Pedagogics" to an "Outcomes-Based" learning model (Morgan 2001: 16). Therefore the need for current perception studies is that much greater in South Africa.

2.6.2. Teacher Attitudes

While the focus of this study is on 'perceptions' of computers in education, many of the attitudinal studies conducted bear a connection to those investigating perceptions. It has become clear to me through consultation with the literature, that a number of studies accept the term 'attitude' as a near synonym for many of the meanings of 'perception' (also in Thurman 1992: 21). Consequently to set the stage for the results of this study, it is useful to look for a moment at previous studies about teachers' attitudes toward computers, as they can and often do bear relevance to my intended investigation.

It is has been argued in the literature that it is necessary to explore teachers' views and attitudes toward technology because "the growth of technology as an instructional tool will depend on teachers' attitudes about these technologies and their ability to use them for instruction and administrative purposes" (Clark 2000: 4). Many studies have gone on to show that the attitudes of the principal and teachers are especially significant in the use of computers and the development of computer-based activities in the curriculum (Cox, Rhodes & Hall, 1988; Cuban, 1986, 1989; Hannafin & Savenye, 1993; Kay, 1993; Robertson *et al.*, 1995; Woodrow, 1991). Research gathered by the OTA (1988) indicated that in a number of cases, teachers' attitudes toward technology do influence their use of technology. Consequently as Clark intimated "educational leaders will not be able to help teachers provide meaningful instruction using technology unless they understand the teachers' attitudes toward computer and related technologies as educational tools" (Clark 2000: 4). Further Todman & Dick (1993) assert that, "an important factor affecting the quality of the child's experience of computers at school may be the teacher's attitude toward computers" (in Christensen, 1998), further indicating the need to understand teachers' attitudes towards computers.

International research indicates that a wide range of attitudes on the part of educators has characterized the introduction of computers in education. Computers in education are subject to many paradoxes: "for some educators it benefits and energises classrooms; whilst for sceptics it constitutes a threat to education itself; for others computers in education has promised much, but to date the results have been disappointing" (Morgan 2001: 36). Studies conducted in the United Kingdom, include Underwood & Underwood (1990) who administered a survey on attitudes of teachers toward the use of computers in schools and found that the "positive responses were received four times as often as negative responses" (Underwood & Underwood 1990: 16).

Dupagne & Krendi (1992) surmise that the way teachers use computers has a direct influence on their attitudes. Results gleaned from the National Survey of Computers in South African Schools found a high correlation between low levels of usage and negative attitudes of teachers towards computer use in the classroom (EPU 2000: 149). From these findings it is clear that teacher attitudes are related to the practices surrounding usage.

A number of studies and reports have also investigated teachers' attitudes toward the use of computers and their *anxiety* about using this technology. Researchers have noted that, with time, as teachers move from anxiety over using computer technology in the classroom to increasing comfort, their attitudes, perceptions and practices also change (Bernauer, 1996; CELT report, 1995). Such studies are of paramount importance because teachers' attitudes about computers and related technologies can positively or negatively influence their students' attitudes toward technology (Sheingold & Hadley, 1990 in Clark 2000: 4).

Much of the literature also intimates that having *knowledge of computers* has an influence, where computer experience has been said to foster positive attitudes toward the use of computers (Bassler *et al.*, 1984; Delfrate, 1987; Honeyman & White, 1987; Loyd & Gressard, 1986; Taylor, 1985). Hence Summers (1990) finding that one of the most ubiquitous reasons for teachers' negative attitudes toward technology is the lack of knowledge and experience in this area. Akbaba & Kurubacak (1998) in their study of elementary teachers in a Cincinnati teachers college revealed that "the more computer experiences a teacher has, the greater the indication that the teacher will feel comfortable and have positive attitudes toward technology" (in Clark 2000: 4) In turn, the EPU's (2000) investigation of Computers in South African schools, found that teachers' attitudes to computers in education are directly affected by the kind of *training* they receive, with poor training resulting in negative attitudes (in Hardman, 2002). This is further noted by Christensen & Knezek (1998).

Research by Woodrow in 1992 found that positive teacher attitudes toward computers are to a large degree recognised as a prerequisite for valuable use of information technology in the classroom. Moreover, she contends that "Attitudes toward computers are thought to influence not only the acceptance of computers, but also future behaviours, such as using a computer as a professional tool or introducing computer applications into the classroom" (Woodrow 1991: 165). Consequently what is being intimated is that it is paramount to nurture positive attitudes toward computers, especially among practising teachers.

2.6.3. Learner Perceptions

"As technology gains a stronger foothold on our educational institutions and becomes a standard instructional tool in the classroom, as well as a fundamental component of cultural literacy, it is critical that we understand learners' responses to this medium" (Krendl & Broihier 1992: 225) as well. While the integration of learning technologies into primary schools is being promoted and supported around the world, it appears that researchers have been more interested in teachers' perceptions of computers and its uses in the classroom than in those held by learners (Bennett & Lockyer 1999: 11). Little research has been concerned with understanding and exploring learners' ideas and perceptions about computers in general, and more specifically, about the ways it is used and could be used in the classroom. While their use of computer technology is prevalent in our schools, our learners' own thoughts and ideas about computers in education should not be neglected.

The impact of computer technology on the current and future lives of our learners makes it decidedly important to understand computer technology from their perspective. Research gathered abroad once again tends to dominate the literature, while a void of studies concerning learners' perceptions of computers in South Africa is evident.

2.6.3.1. International Studies

One of the few investigations of learner perceptions came under the Apple Classrooms of Tomorrow program. Tierney *et al.* (1992) followed six high school students for four years while they used computer technology and observed that the learners "became more aware of computers as a powerful tool, while their enhanced computers skills were seen as important for achieving future career and personal goals"(Bennett & Lockyer 1999: 14) .

The David and Lucille Packhard Foundation found that "amidst the research, policy and advocacy regarding children's use of technology, children's own thoughts about the role computers play in their lives are often neglected" (Behrman 2000: 186). A survey conducted in late 1999 early 2000 on what learners, from projects Plugged In and the Computer Clubhouse, thought about the uses of computers in schools revealed a variety of computer-based experiences

from educational projects, to writing emails, chatting online and creating web pages. While their favourite activities included playing games, drawing pictures, writing letters and surfing the Web (Behrman 2000: 186), nearly all the learners maintained that they "valued the role of computers in their lives" and that computers provided them with "entertainment, a tool for accomplishing a goal, and a vehicle leading toward present and future competence, autonomy and empowerment" (Behrman 2000: 187). When asked about their difficulties and frustrations with technology, respondents primarily pointed out the time it takes for computers to boot up and go online, react to commands, and complete downloads. Additionally they recounted difficulties setting up and communicating with computers and frustrations with computers freezing or crashing (Behrman 2000: 186). It was deemed a worthwhile study as learners have much to express about why it is important for them to have and use computers.

A further study conducted by Selwyn (2000) in five schools in South and Mid-Wales explored the perceptions and views of primary school learners in discussing and rationalising their use of computers in the primary school classroom. Four themes emerged from group-interview data with the 267 learners: 1) the speed and ease of word-processes when using computers; (2) the extending or curtailing of learners' abilities when using computers; (3) freedom and restrictions of the finished product when using computers and, (4) concerns over originality and authenticity when using computers (Selwyn, 2000).

As recently as 2001, Mumtaz, in three British primary schools with Year 3 and Year 5 pupils, sought to examine how primary school learners perceive and experience the use of computers in the home and the school and in turn made valuable discoveries. What emerged was that the school computer use was 'tame' in comparison to home use, with the most frequent activity at the school computer being word processing, which learners considered boring and time-consuming (also supported in Buckingham, 1999), while the favoured home activity on the computer, enjoyed by 85 % of the learners, was playing games. Scenarios of anger when using the computer in both the home and at school were mostly related to technical errors, with 56 % of the learners angry when the computer crashed. Frequency of computer use was found to happen only occasionally (53 %) at school, with only 18 % of participants indicating that it happened at least once a week. The results of this study primarily suggest that what is important

to the learners is the choice of activity, control over time, and working by themselves leading to less restrictive access.

Other authors such as Levin & Barry (1997) have also carried out investigations into how learners perceive computers in the home and school. What emerged was that learners in grades 3-5 drew pictures showing the computer as a tool for doing work (in the school). These learners depicted word processing as being the most prevalent use of the computer in their drawings (in Mumtaz 2001: 350), while home usage was depicted through drawings of playing games.

In a Finnish study, a national assessment of learners' skills and practices of using ICT was undertaken with elementary (11-15 year old) and high school (16-18 year old) pupils. 515 responses revealed the following primary beliefs:

- Computer supported learning makes learning more meaningful and motivates one to study.
- Computers should be used more in studies.
- Computer usage was supported as a tool for collaborative learning.

(Hakkarainen *et al.* 2000: 103).

A further study conducted in the United Kingdom with Grade 4 through 7 learners was undertaken to find out what learners want to learn about computers. A summary of the main findings, presented below, suggest:

- Learners (Gr 4-7) enjoy learning about computer technology through independent exploration.
- Learners generally expressed confidence in their ability to use computers but there is evidence of gender differences in these beliefs.
- Learners believe that computers are helpful and that they will use them more in their future workplaces than in school.

(Dooling 2000: 21-22)

Other researchers, Wishart (1990) also show that "learners enjoy programs which give them control, especially when the programs are challenging" (in Mumtaz 2001: 358). This is backed up by Shotten (1989) who observed that learners using computers "appeared to delight in finding their way about the computer system through their own efforts, learning from mistakes, as they progressed" (in Mumtaz 2001: 358).

A 3 year study by Krendl & Broihier (1992) examined the development, also of a similar age group (Gr 4-10), of learners' perceptions about computers on three dependent variables:

preference; perceived learning; and perceived difficulty. The evidence suggests preference for technology generally declined over time, while perceived difficulty of using computers remained stable. Furthermore perceived learning from computers declined over time. Within all three levels, both gender and grade level were significant predictors of perceptions. In contrast researchers have found that learners' level of confidence with technology has been seen to increase as a result of practice and experience (Arndt *et al.*, 1985; Dalton & Hannafin, 1984; Dalton & Hannafin, 1985; Griffin *et al.*, 1986; Koohang, 1989; Moore, 1985;).

In another study this time from Kinnear (1995), data on children's perceptions over a nine-month period of computer use in Grades 4-7 primary classrooms, revealed that the majority of the learners agreed that computers in the classroom were a "good idea" (Kinnear 1995: 36). The study of Clarke (1989), who investigated the effect of computer use and school type on computer attitudes of primary-aged children, also demonstrated that most children indicated a high interest in using computers. Furthermore Kinnear's study confirmed that the learners tended to agree that the relationship between computer knowledge and the ability to obtain jobs would exist. Interestingly and pertinent to my intended study is specific focus placed on Grade 6/7 classroom. In the relevant classroom, maths software was consistently identified as best liked. Additionally learners' comments supported the view that boys used the computer more than the girls in this classroom.

Past studies have also intimated particular concerns by learners of the use of ICT in schools. An influential study prepared for the Department for Education and Skills (DfES) on Young People and ICT (2001) revealed three predominant impediments as mentioned by those learners in Key Stage 3 (11-14 years old) relating to making more use of computers at school: lack of time (45 %); a limited amount of computers (23 %); and the need to share a computer with others (17 %) (DfES 2001: 3). The same study also investigated time spent using computers at school. Learners between the ages of 11 to14 years old reported an average weekly computer usage at school of 3 hours with the most common use of computers at school for those learners being writing reports, hence pointing to word-processing packages as the most commonly used software packages. Moreover, the Office for Standards in Education (OFSTED) findings in 1998, also confirm limited use and limited access, with poor teaching of IT in primary schools.

2.6.4. Learner Attitudes

As mentioned previously, attitudinal research bears a connection to research concerning perceptions. Consequently here too, it is useful to look for a moment to previous studies with respect to learners' attitudes towards computers, as they can and often do bear relevance to my intended investigation and have been found to be of significance, in that attitudes toward computers are believed by a number of researchers to influence:

- future use of and behaviour toward computers (Fann *et al.*, 1988-89; Levine & Donitsa-Schmidt, 1997; Woodrow, 1991)
- use of computers in optional circumstances (Fann *et al.*, 1988-89)
- acceptance of computers (Selwyn, 1997)
- future subject enrolment at school and selected career path (Busch, 1995; Levine & Donitsa-Schmidt, 1997)

(in Whitrow 1999: 2)

Research investigations into primary school learners' attitudes to computer use in the classroom are negligible though. Leading theorists, Bear, Richards, & Lancaster (1987) and Martin, Heller, & Mahmoud (1992) have inferred that studies of primary learners' attitudes toward computers are markedly sparse. Consequently the area of learners' attitudes toward computers, how these attitudes could possibly be influenced by the pattern of classroom use, grade level, and the role that gender might play in the development of attitudes is fairly untapped. However, I will attempt to consult the few studies which do bare relevance in this area.

Researchers did not begin to study children's attitudes toward computers until the early 1980's when computers reached the elementary (5-11 years) and middle schools (11-14 years) in first world countries, such as the United Kingdom and the United States. However we are now 20 years on and this area of research has remained fairly minimal.

The previously consulted DfES (2001) study also looked at the attitudes of learners and concluded that Key Stage 3 (11-14 years) learners' attitudes toward computers were on the whole positive (DfES, 2001), with the feeling that using the computer was enjoyable (80 %) and allowed them to be more creative (81 %). Also agreed upon was the fact that the computer had assisted them to produce work which they were really proud of (86 %). Martin, Heller & Mahmoud (1992) in their study of eight to twelve year old American and Soviet children's attitudes toward computers, also concluded that "kids like computers" (Martin, Heller &

Mahmoud 1992: 181). While the two countries exposed their learners to different computer experiences; most of the learners thought that whatever they were doing on the computer was fun.

Much of the recent computer attitudinal research on children has been concerned about the effects of *gender* on computer attitudes. Krendl & Broihier (1992) and Chen (1985) found that gender is a critical factor in understanding learners' responses to technology. However, previous research investigating significant gender differences between male and female learners' attitudes toward computers has been inconsistent and conflicting. Some research supports the idea that student attitudes toward computers are significantly different between males and females (Brunner & Bennett, 1997; Eastman & Krendl, 1987; Fitzgerald, Hattie & Hughes, 1985; Jones, 1987; Koohang, 1989; Siann *et al.*, 1990; Wilder, Mackie, & Cooper, 1985). A number of research studies have reported that males have a higher computer self-efficacy and more positive attitudes towards computers than females (Inkpen, 1997; Nelson & Cooper, 1997; Whitley, 1997). While in contrast, other research supports the idea that there are no significant computer-related attitude differences between males and females (Hurley & Vosburg, 1997; Knezek & Christensen, 1995).

It has also been established in a review of the literature on *grade level* and *age differences* in attitudes toward computers that a slight but significant relationship between age/grade and computer enjoyment exists (Loyd & Gressard, 1984; Smith, 1987). Furthermore Bear, Richards & Lancaster (1987) found that computer enjoyment is higher among thirteen to fifteen year olds and primary school learners, than older learners.

Researchers have also reported significant findings between *experience* and attitudes of learners. Learners who are exposed to computers have a more positive attitude towards computers than those who are not (Clark, 1997; Dawes *et al.*, 2000; Hennessy, 2000; Kirkman, 1993; Levine & Donitsa-Schmidt, 1998; Miyashita, 1994; Pedretti *et al.*, 1998; Renaud, 1998; Soyibo & Hudson, 2000; Woodrow, 1994). Arenz & Lee (1990) and Sacks, Bellisimo, & Mergendoller (1994) have also identified the effect of experience on the development of positive attitudes, while Weil & Rosen (1995) have found some experience contributes to negative attitudes that endure over time. It is proposed also by Levin and Gordon (1989) in their study of 222 Israeli learners'

computer attitudes and experience of computers, that a higher amount of computer experience and usage results in more positive attitudes toward computers. Furthermore findings from the four year study, the Young Children's Computer Inventory (Knezek, Miyashita & Sakamoto, 1994) have shown that three or four years of computer exposure in primary school can have a measurable positive impact on children's attitudes toward computers, motivation and study habits (Knezek, Miyashita & Sakamoto 1994: 7).

The American National study, Apple Classrooms of Tomorrow carried out with Grades 5 to 12 aimed to study the influence of technology rich environments and staff development on teaching and learning among teachers and learners, reported that teachers believed that learners' attitudes towards learning changed with the inclusion of computers in their classrooms (in Hardman, 2002). Teachers found that many learners began to report that previously unpopular subjects such as mathematics or spelling were now 'fun'.

2.6.5. Teacher & Learner Perceptions & Attitudes

As previously stated there have been few investigations looking both at teachers' and learners' perceptions and/or attitudes of computers in the same study. Indeed much research literature is still focussed on teachers' and learners' perceptions independently. However some of the studies which have focussed on both will be examined below. Studies conducted internationally will predominate once again, as there is a void of published South African studies in this area of the literature.

2.6.5.1. Perception Studies & Attitude Studies

Early research established that often there is a marked difference between the perceptions and attitudes of learners and those of teachers toward computers (Johnston, 1985; Smith, 1986). In support, Richards (1996) more recent survey revealed such differences between learners' and teachers' perceptions of the Internet, with 92 % of learners rating the Internet as an effective teaching and learning tool, compared with only 58 % of teachers.

An investigation on the other hand by Love (1993), of how 7th and 8th Grade learners at an

intermediate school react to the presence of computers in their classroom, compared to the reactions of what their teachers perceived the learners thought about computers, revealed that 70 % of the learners were really "into" computers. Additionally, all the teachers, reportedly 100 % committed to the use of computers in the school, believed that *all* learners viewed computer use in the school as "the greatest thing since sliced bread" (Love, 1993).

There are also studies and reports that have looked at both teachers' and learners' attitudes towards computers, using the Teacher Attitude towards Computers Questionnaire (TAC) and the Computers Attitude Questionnaire (CAQ) (Christensen, 1998; Christensen & Knezek, 1998; Knezek *et al.*, 1999; Morales, 1999; Soloway *et al.*, 1999). Knezek & Christensen's 1997 study compared the attitudes toward information technology of learners and teachers at two parochial schools (Dallas & Tyler schools) in North Texas. Research findings intimate that teacher and learner attitudes toward computers and related information technologies, were surprisingly similar at the two parochial schools. However, teachers at the Tyler school were found to be more positive on the attributes of computer relevance and computer aversion than those at the Dallas school, whereas learners at the Tyler school were more positive about the importance of computers and their enjoyment of computers, than those at the Dallas school.

Morales' (1999) study in four states of Mexican teachers' and 9th Grade learners' attitudes toward computers, revealed significant differences between states in both learners and teachers. A notable finding was that learners from the state of Guanajuato and teachers from the state of Tlascala were most enthusiastic and enjoyed the use of computers more than their counterparts.

While South African studies are limited, one M.Ed. study (Morgan, 2001) looked at both teachers and learners in light of computer integration in their school, St. Stithians College. Teachers' attitudes and aptitudes towards computers revealed that teachers were positive towards computer assisted education. Noteworthy findings were that 67 % of teachers focussed on the use of email in the classroom for communication purposes, while just ahead were 74 % of teachers reporting the use of the Internet in the classroom for research purposes. The majority of learners who participated in the survey appeared to have a positive perception towards the use of computers in an academic context: 68 % of learners thought that computers made work easier;

59 % believed that computers increased academic interest and 57 % of learners believed that computers enhance creativity (Morgan 2001: 63).

2.7. CONCLUSION

Findings presented in the consulted reports and studies indicate that the area of teachers' and learners' perceptions is a valuable and noteworthy one. Moreover it is clear from the consulted studies that there remains still much to be explored in teachers' and learners' perceptions toward the use of the computer. There is a dearth of literature concerning both teacher and learner perceptions within the same study, and even more so in the South African research circles.

A slight adaptation of Woodrow's (1992) view, to include 'learners', makes for a powerful acknowledgement, "that if technology as a learning and teaching tool is to be maximised teachers' (*and learners'*) attitudes (*and perceptions*) toward computers must be continually monitored" (in Bolinger, 2000). Consequently it is the aim of this study to further explore their perceptions not independently, as has been prominent in current research, but simultaneously. The voices of both learners and their teachers "can help enrich and enlighten discussion of the role of technology in our lives. We should take the time to listen" (Behrman 2000: 187).

CHAPTER THREE

RESEARCH METHODOLOGY

The purpose of this chapter is to review and discuss the data collection methods and plan that support this study. The research examined teachers' and learners', from four ex-model C primary schools, perceptions of the use of the computer in Grade 7. This was achieved primarily by means of a questionnaire, which assessed the perceptions of teachers and learners re computer usage in Grade 7 with findings substantiated by observations and teacher interviews.

3.1. SETTING & SAMPLE

3.1.1. Setting

The study was limited to four ex-Model C primary schools. Apartheid education legislation created three schooling classifications to match the segregation of society along racial lines. Model C schools were for 'white' learners, House of Representatives schools for 'coloured' and 'Indian' learners and Department of Education and Training schools for 'black' learners. Post-apartheid legislation has moved to the establishment of a unified non-racial education system, however previously advantaged schools (Model C) are commonly referred to as ex-Model C schools in the education domain. To elucidate the socio-economic background of the four schools, the school fee structure per school per year is delineated in the Table below. The school fees are used as a proxy for socio-economic status.

Table 1. School Fee Structure per School

	SCHOOL A	SCHOOL B	SCHOOL C	SCHOOL D
SCHOOL FEES PER YEAR	R3120	R4400	R6620	R4600

The schools approached to participate in this study, were chosen as I had previously conducted research on computers in education in these schools and I was familiar with their approach to Information and Communication Technology. I focused on one Grade 7 class per school, as

these learners were involved in their final year of the primary school and had been exposed to using computers throughout the primary school phase.

School A is a relatively small primary school, with one class of between 30-35 learners per grade. The school had a computer laboratory with 18 computers and a computer specialist teacher for Grades 1-7. Classes were split into two groups for their computer allocated time with the first hour session for 15 learners, followed by a second session of 15 learners.

School B, had two classes per grade of between 25-30 learners. The school's computer laboratory with 16 computers meant here too that only half the class could access the computer at any one time. Sessions where accordingly arranged as with School A. At SchoolB one class teacher per grade took on the role as the computer allocated teacher for all classes within that particular grade.

School C, was a large school in comparison to School A and School B. School C had four classes per grade of between 30-35 learners. While boasting a computer laboratory with 35 computers and a computer specialist teacher, all classrooms were also equipped with a networked computer.

School D was similarly large with four classes per grade of between 30-35 learners. They too had a well-equipped computer laboratory with 35 computers and a computer specialist teacher, as well as all classrooms being equipped with a networked computer.

3.1.2. Sample

The population parameters for this study were teachers and learners from four ex-Model C primary schools situated in the Southern Suburbs of Cape Town.

The *teachers* totalled four English speaking female teachers. The majority of the teachers were in the 41-45 age group (n=3), with one teacher (Teacher 3) between 31-35 years of age. Of the four teachers, three teachers were computer specialist teachers for all grades in the school and hence reported using computers daily for instruction in the classroom, while one teacher (School B) was both a class teacher and the computer allocated teacher for Grade 7. For the purposes of

this study focus was placed upon the computer specialist or allocated teachers as they were directly involved with the use of computers with the learners. All teachers had been teaching for more than 11 years, with three teachers having more than 15 years of teaching experience. The teachers were working in a privileged environment and were all trained (Appendix A, Table 2 & 3, p.107). What one must remember though is that this may not be representative of the rest of South Africa.

Table 2. Demographics of Teachers Completing the Questionnaire

Teacher	Grade	Years Teaching	Age	Gender	Language	Computer at home	Use of home computer	Training	No. of yrs since 1st computer training
School A, Teacher 1	7	15+	41-45	Female	English	Yes	Everyday	Yes	7
School B, Teacher 2	7	15+	41-45	Female	English	Yes	Everyday	Yes	8
School C, Teacher 3	7	11-15	31-35	Female	English	No	-	Yes	5
School D, Teacher 4	7	15+	41-45	Female	English	Yes	Everyday	Yes	10

Of the *learners* participating in the study, 64 were female and 56 were male. Table 2 below, represents the breakdown per school of male and female learners.

Table 3. Gender Breakdown of Learners per School

GENDER	FEMALE	MALE	TOTAL
School A	19	11	30
School B	11	15	26
School C	15	17	32
School D	19	13	32
TOTAL	**64**	**56**	**120**

The majority of learners spoke English (n=103) and of the 120 learners, 96 reported that they had access to a computer at home which was reportedly used everyday by 61 learners, and once a week by 24 learners (Appendix B, p.108). Consequently, we can assume some computer literacy for the majority of the sample.

3.2. BACKGROUND INFORMATION / THE CONTEXT

3.2.1. Teachers

Teachers reported that learners engage for one hour or less (n=3) per week in computer-based activities for curricular purposes, with one teacher reporting between 2 and 4 hours per week due to the fact that classrooms in School D are all equipped with a computer. The learning areas in which computers are prioritised are in Language and Mathematics, with mention being made of other learning areas by particular teachers (Appendix C, Section 4, Table 3a, p.112). The foremost purposes for which computers are used in Grade 7 are for the presentation of assignments, researching projects and word processing (Appendix C, Section 4, Table 5a, p.112). It was stated by all teachers (n=4) that the level of engagement with computer-based tasks for Grade 7 learners is 'just right'.

3.2.2. Learners

The majority of learners stated similarly that they used the computer at school per week for 1 hour or less (65 %, n= 78). Of the Grade 7 learners 54 % of learners reported using the computer with friends in class or on their own. The most common use of computer at school for those in Grade 7 was school projects (88 %, n=105), playing games (85 %, n=102), typing (84 %, n=101) and using the Internet (83 %, n=99), which is largely confirmed by the consulted teachers (Appendices D1 & D2, Section 4, Table 3, p.119 & p.123).

3.3. RESEARCH APPROACH

3.3.1. Quantitative Research

This study primarily engaged a quantitative research paradigm. Theorists argue that the main reason for using quantitative research is to "determine whether a particular population shares certain characteristics in common" (Chappell, 2002). Descriptive or survey research, as it is commonly referred to in the literature, usually involves "studying the preferences, attitudes, practices, concerns or interests of some group of people" (Gay & Airasian, 1999). The quantitative aspect of this research by means of the questionnaires, aimed initially to compare

schools' responses with regard to how and why computers are used in the Grade 7 classroom. However in light of the data analysis (few differences found between schools), it subsequently sought to look at schools in an entirety. Questionnaire responses were analysed in terms of frequency of response.

3.3.2. Qualitative Research

This research paper while it engaged predominantly a quantitative research paradigm, also included a qualitative data aspect in the form of observations and teacher interviews, which were used to triangulate the data responses from the questionnaires. Qualitative research assumes a worldview in which "there are multiple realities – that the world is not an objective thing out there but a function of personal interaction and perceptions" (Merriam 1988: 12, in Gay 1997). Strauss & Corbin (1990) and Patton (1990) consider that qualitative and quantitative research can be effectively combined in the same research study. The study was concerned to gain insight into a particular phenomenon from the participants' perspective.

3.4. DATA COLLECTION PROCEDURES

The data collection for this study was conducted in a field setting. Questionnaires, observations and interviews were all used in the data collection process. It was imperative to my study to gain access to the natural environments of the learners and teachers, in order to fully discern their perceptions.

3.4.1. Questionnaires

3.4.1.1. Teacher Questionnaire Development & Content

A questionnaire was designed for the teachers of the respective classes to explore their perceptions of computer use in Grade 7. The general benefits of a questionnaire are thought to make it appropriate i.e. "consistency of presentation of questions to the respondents, a greater perception of anonymity for the respondents and less time-consuming to administer" (Lewis & Munn, 1987; Munn & Drever, 1990 in Robb, 1996). The teacher questionnaire was structured

after consultation with a number of educational technology perceptual and attitudinal studies: Becker (2000); EPU (2000); Hogarty & Kromrey (2000); Kershaw & Cousins (1990); Knezek & Christensen (1995); and Knezek & Christensen (1998). To determine the accuracy, clarity and usefulness of the instrument, a field test of the preliminary questionnaire was conducted with one of the computer specialist teachers of the intended study. The questionnaire was revised to include demographic information regarding the teachers' ages, whether or not they had access to a computer at home and how often they accessed their home computer. Further changes were made to the answer options from Section 4, Question 1 ('Learners engage in computer-based activities for curricular purposes') by adding to the first option, 'one hour/less than one hour'.

The questionnaire (Appendix E) comprised seven sections, included therein structured items with clear-cut responses and open-ended questions, investigating the teachers' perceptions with regard to: level of comfort and confidence; general attitudes toward computers; integration of computers into the classroom; usability; importance of computers; computers for learners. The final section of three open-ended questions, allowed for the teachers to express in their own terms any perceived benefits for learners in using computers; any disadvantages perceived for the learners in using computers and thirdly how they would like to see information technology further developed, or alternatively, reduced in their classroom/school. The use of structured questions according to Bradburn (1983) "produces more relevant and comparable responses, whereas open-ended questions produce fuller and deeper replies" (in Houtz & Gupta 2001). While the study focused primarily on perceptions pertaining to how and why computers are used in the Grade 7 classroom, I felt that it was important to explore related areas such as teachers' level of comfort and confidence with computers, as well as general attitudes toward computer use, as these could very well have a bearing on the way in which teachers use the computer with their learners and how they feel about that specifically. Several demographic items were also included at the beginning of the questionnaire. These items were appended for the purpose of collecting descriptive data about the sample.

Teacher questionnaires were hand delivered to the respective teachers by the researcher in March 2003, and completed at the teachers' leisure and subsequently collected before observations were undertaken in the classroom settings.

3.4.1.2. Learner Questionnaire Development & Content

I also decided to use a questionnaire to gather the perceptual data from the learners for this study. This questionnaire was also developed through consultation with a number of educational technology perceptual and attitudinal studies: DfES (2001); Knezek & Christensen (1995); Knezek *et al.* (1994); Knezek *et al.* (1999); and Maor & Fraser (1996). The ideal length for the questionnaire was determined to be three A4 pages to reduce the risk that the respondents would get bored or frustrated. The questions were mainly closed-ended, with some open-ended questions included.

The questionnaire (Appendix F) comprised four sections investigating the learners' views with regard to computer enjoyment, computer importance, classroom environment and usability. A five point Likert scale was used in the first three sections. It was thought appropriate as it has been used in studies with middle school learners in measuring their attitudes towards computers (Knezek & Christensen, 1997). Weighted values were assigned as follows: strongly agree 5, agree 4, undecided 3, disagree 2, and strongly disagree 1. The questionnaire also included three open-ended questions, allowing for the learners to express freely on their best and worst things about using the computer and their reasoning as to why they feel they use the computer in Grade 7. Several demographic items were also included at the beginning of the questionnaire. These items were appended for the purpose of collecting descriptive data about the sample related to their gender, age, access to a home computer and computer usage. Through the use of the questionnaire, I hoped to be able to get a general feel for the learners' views on how and why computers are used in the Grade 7 classroom. This questionnaire was also field tested in one of the intended schools with 29 Grade 7 learners. Changes resulting from the pilot test were to the answer options of question 16 ('How much time do you spend on the computer at school during lessons, per week') by adding to the first option, 'one hour/less than one hour'. Additional demographic data was also required by adding the question, 'Do you use a computer at home?', and 'How often?'. Questionnaires were administered to the learners by the researcher in March 2003, before observations took place in the respective classes.

3.4.2. Interviews

For the purposes of this study, semi-structured interviews with the respective Grade 7 teachers were also used (Appendix G). The proposed questions related to the sections as outlined in the questionnaire to be completed by the teachers. They were used to enhance the collected questionnaire data and provide richer input from the teachers. Not all questions asked though, were of final significance to the study, because as Lofland & Lofland (1984) argue, "interview guides can be modified over time to exclude questions the research has found to be unproductive for the goals of the research" (Lofland & Lofland, 1984 in Hoepfl, 1997).

It should be acknowledged that interviews comprise the interviewee's understandings and perceptions. A challenge of the interview process can be that the interviewer could bias the interviewee's responses. As the interviewer I aimed to be aware of my biases, so as to avoid this. Interviews were scheduled at the participants' convenience and took place in teachers' classrooms. The interviews with the respective teachers were audio-taped and subsequently transcribed for analysis (Appendix H 1,2,3,4), because "Recordings have the advantage of capturing data more faithfully than hurriedly written notes might, and can make it easier for the researcher to focus on the interview" (Hoepfl, 1997).

I did not interview the learners as I hoped to gain much insight through their questionnaire responses, however future studies could benefit from interviewing the learners, as I feel certain issues could be further probed in order to come to a number of conclusions.

3.4.3. Observations

Observations of participants, the Grade 7 learners and their respective teachers, in the context of a natural scene were also adopted. "Observational evidence can be very helpful for understanding why things are as suggested by other data sources" (Anderson, 1990). Observations can lead to deeper understandings "because it provides a knowledge of the context in which events occur, and may enable the researcher to see things that participants themselves are not aware of, or that they are unwilling to discuss" (Patton, 1990 in Hoepfl, 1997). Within the context of this research it was felt that non-participant 'naturalistic' observation was required.

In this form of observation the observer is not directly involved in the situation. Gay (1987) describes the observer's role as one where,

> ...the observer is on the outside looking in and does not intentionally interact with, or affect the object of the observation.
> (Gay 1987: 206)

I observed two lessons per school, one lesson focusing on the teacher and one focusing on the learners between May and June of 2003 with observations lasting for one hour each. Initially, I observed more than 1 lesson but found that teachers did not vary their practices significantly across lessons. That is, initial observations suggested that teachers' and learners' behaviour and perceptions to computers did not change across lessons. Consequently, I elected to observe two hour long lessons (one lesson focussing on the teacher and one on the learners) at each school. Furthermore observations of the participants using the technology were valuable, as I believed it beneficial to observe the manner and extent to which teachers' visions were translated into practice. I also felt observations would help me understand how teachers' perceptions about technology use were reflected in the ways they used technology in their classrooms. As for the learners, observations of them I believed would aid me in exploring and understanding their actions and behaviour in light of their views about how and why computer technology is used in their classrooms. All observations were recorded on an observation schedule sheet (Appendix I), adapted from Hardman (2002), along with field notes. I chose not to focus closely on both teacher and learner actions and reactions in the same lesson, but rather focus my observation on one group per lesson, because when undertaking the pilot study in one of the schools, I found that too many occurrences were happening in the class for me to successfully focus on both the learners and the teacher intently in one lesson. Although recording general class interaction, I further sampled three learners from each class for a fine grained observation. These learners were selected on the basis of the questionnaire data, in terms of high (learner 1), middle (learner 2) and low interest (learner 3) in computers.

Field observations rely heavily on the researcher's own perceptions and judgments and on preconceived notions about the area under study. There may therefore be `researcher bias'. However I aimed to try as much as possible to reduce this. I was also cognizant that through observations, "The presence of an observer is likely to introduce a distortion of the natural scene which the researcher must be aware of, and work to minimize" (Hoepfl, 1997). It was important

to guard against the presence of the researcher modifying the normal course of observed events; consequently I sought to observe the teachers and learners using the computer in their natural setting (i.e. the timetabled weekly lesson) without any lesson participation on the part of the observer.

3.5. DATA ANALYSIS PROCEDURES

The reviewing of the data collected involved analysis of the teacher and learner questionnaires, teacher interviews and classroom observations of the computer allocated time. The approach to the analysis of the data included looking for trends and patterns from the participating schools in reference to teachers' and learners' perceptions of how and why computers are used in the Grade 7 classroom.

3.5.1. Teacher Data

Teacher questionnaires were captured in Microsoft Excel by assigning each question a weighting for the Likert scales and codes for subsequent questions, and were analysed under the headings as set out in the teacher questionnaires to ascertain frequencies of: level of comfort and confidence; general attitudes towards computers; integration of computers into the classroom; usability; importance of computers; and computers for learners. Tables were formulated from the inputted data to ascertain if any differences could be noted between the teachers from the different schools. Few differences were evident (Appendix J) therefore I chose to look predominantly at the teachers' perceptions together. While the teacher questionnaire comprised seven sections, the sections and questions pertaining directly to teachers' perceptions of computers were selected for discussion, with subsequent sections providing much of the contextual data of the study and areas for future research. 'Missing' or 'spoilt' questionnaire responses were difficult to follow up with the respective teachers due to time constraints and the busy schedules of the teachers involved.

Triangulation was adopted to substantiate the findings of the study through the use of the interview and observational data. Observations were recorded on the observation schedule, along with fieldnotes, which provided further insight into teachers' stated perceptions from the

questionnaires. I thus analysed the classroom observation data in light of the themes that emerged from the teacher questionnaire data to look for corroboration between the data sets, while transcribed interviews with the respective teachers were used to gain a deeper understanding of teachers' perceptions with respect to computer use in Grade 7. During analysis, interview data provided the elaboration to the questionnaire data. All interview data was sorted in light of the themes that emerged from the teacher questionnaire data.

3.5.2. Learner Data

Learner Questionnaires were also captured in Microsoft Excel by assigning the closed-ended questions a weighting for the Likert scales (Sections 1, 2 & 3) and codes for subsequent questions. From the open-ended questions (Questions 20, 21 & 25, Appendix K 1,2,3,4), categories were formed from the learner responses (Appendix L). The data was then analysed under the headings as set out in the learner questionnaires to ascertain frequencies of: computer enjoyment; computer importance; classroom environment; and usability pertaining to the learners. Tables were formulated from the data to ascertain if any differences could be noted between the learners from the different schools. Few differences were evident (Appendix M); therefore I chose to look at the learners' perceptions together. While the learner questionnaire comprised four sections: computer enjoyment, computer importance, classroom environment, and usability, the questions and sections pertaining directly to learners' perceptions of computers were chosen for discussion, with subsequent questions providing the contextual data of the study and areas for future research.

Observations of the learners, also recorded on an observation schedule along with fieldnotes, provided further insight into learners' stated perceptions from the questionnaires. Here too I analysed the classroom observation data in light of the themes that emerged from the learner questionnaire data to look for corroboration between the data sets.

3.6. ETHICS

Permission to undertake research in the Grade 7 classrooms of the participating schools was requested from the Western Cape Education Department (Appendix N) and the Principals of the

participating schools. I arranged times which were convenient for the teachers of the respective classes for questionnaire completions, observations and follow-up interviews. I also ensured that the identities of the four schools and the respondents were not revealed. On completion of the research in the four schools, a letter was drafted thanking the schools and teachers involved for their time and willingness in participating in the research study (Appendix O). The participating schools will also be presented with a copy of the research report.

3.7. CONTROL OF VALIDITY & RELIABILITY

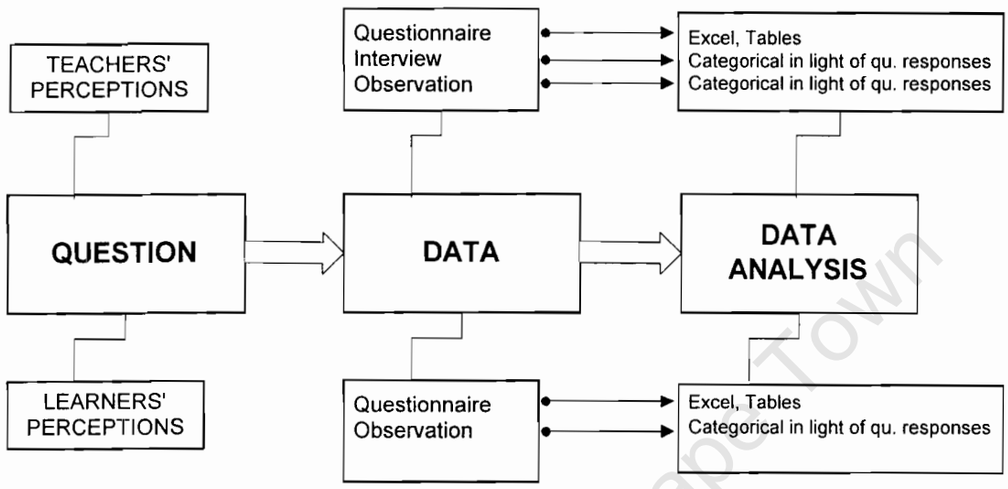
As in all research, consideration must be given to validity and reliability. Internal validly and reliability issues are addressed in the research study design and process. External validity or the ability to generalize will be discussed in the 'limitations' of my research study (Chapter 5, p.88). To increase validity, multiple data sources were used to cross-reference the findings. The questionnaires provided insights into teachers' and learners' perceptions of the use of computers in Grade 7. Observations provided insight into teachers' and learners' stated perceptions from the questionnaires. Interviews provided a deeper understanding of teachers' perceptions with respect to computer use in Grade 7. The triangulation of the data in this manner reduces the possibility of drawing false or misleading interpretations of the data. Cohen & Manion (1989) and Parlett & Hamilton (1976) argue that triangulation of data can help validate the data and overcome the risk of "gross partiality" of using only one method of data collection.

Issues of reliability are addressed through using four schools in this study and looking for replication in the descriptions of the participants. The use of the questionnaires, interview and observation protocols provided consistency in the same procedures being used for each case (Yin, 1993). The rationale for using multiple sources of data is the triangulation of evidence. Triangulation increases the reliability of the data and the process of gathering it.

Comparisons with related literature also provided a check for consistency or replication of the findings. Reliability was achieved through the use of consistent protocols for interviews and observations. A semi-structured interview protocol was developed to ensure that a consistent core of questions was asked of all participants. Key observation categories were developed for note-taking during each classroom session to ensure consistency across classrooms and across

time. Conducting more than one observation in each classroom increased the reliability of the data collected in classrooms. An observation protocol defining categories and events was developed and reviewed frequently to ensure observational fidelity.

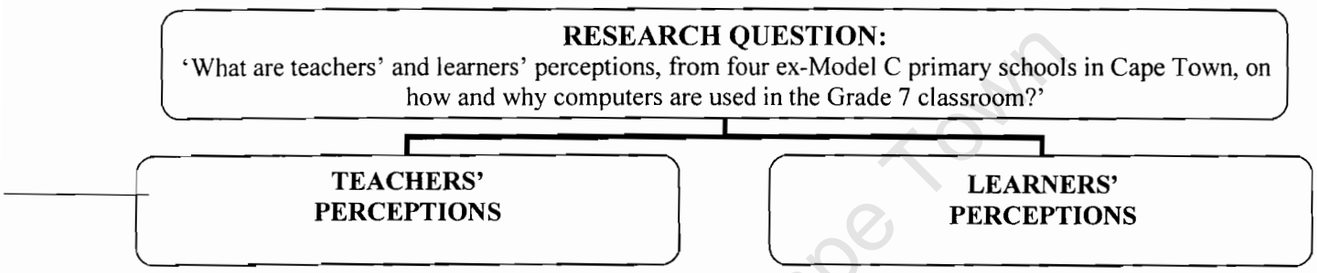
3.8. DIAGRAMMATIC REPRESENTATION OF RESEARCH DESIGN & METHODS



CHAPTER FOUR

PRESENTATION OF FINDINGS & DISCUSSION

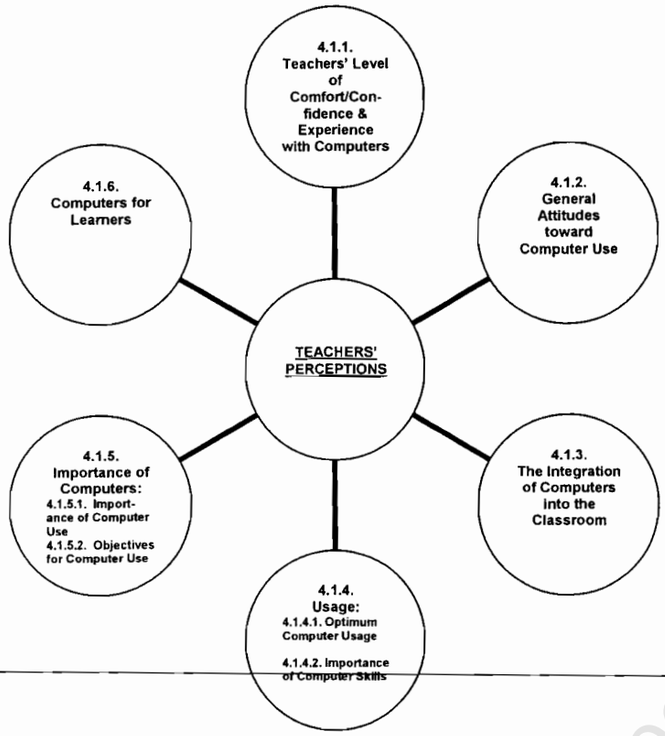
The purpose of this chapter is to present and discuss the findings obtained through the teacher and learner questionnaires, with observational and interview data used to triangulate the data. The focus, 'What are teachers' and learners' perceptions, from four ex-Model C primary schools in Cape Town, on how and why computers are used in the Grade 7 classroom?', will be divided into two main components in the presentation of the findings and discussion: teachers' perceptions and learners' perceptions from the four schools.



4.1. TEACHERS' PERCEPTIONS

The questionnaire designed for the respective teachers sought to elicit teachers' perceptions of computers in Grade 7. While the teacher questionnaire (Appendix E) comprised seven sections with regard to: level of comfort and confidence; general attitudes towards computers; integration of computers into the classroom; usability; importance of computers; computers for learners; and a final section of three open-ended questions pertaining to advantages and disadvantages of computer use and further development of computer use in the schools, sections and questions pertaining directly to teachers' perceptions of computers will be analysed in the subsequent discussion, while the supplementary questions therein will be attached as appendices

for reference. The analysis process will as a result focus on the following six categories in light of the questionnaire, interview and observational data:



4.1.1. Teachers' Level of Comfort/Confidence and Experience with Computers

The evidence from Table 4 shows that the responses of the participating teachers reflect that they are generally comfortable and confident in their experience with computers in the classroom.

Table 4. Teachers' Level of Comfort/Confidence and Experience with Computers

Question	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1. I am comfortable using computers during classroom instruction				1	3
2. My use of computer technology enhances learner performance			1	1	2
3. Incorporating computers into lessons enhances teaching				2	2
4. I use computers effectively in my classroom			1	1	2
5. I am developing expertise in the use of computers in the classroom				2	2
6. I am comfortable giving computer-related tasks to my learners				2	2
7. I am comfortable with computer terminology				2	2
8. I have had adequate training in using computers			1	2	1

In general, all respondents indicated that they felt proficient in the use of computers in their classrooms. These findings are consistent with other studies on teachers' confidence with technology, where in a study by Clark (2000), 75 % of the teachers stated they felt proficient in their use of technology in their classrooms. This finding of the present study is important, as it has been argued that proficiency is linked to optimal use, which in turn leads to the use of the computer as an effective tool for learning.

Research by Hogarty & Kromrey (2000), found however, the most differences between their study samples (Pinellas County Schools teachers), were on the items pertaining to comfort and efficient use of computers during classroom instruction and the enhancement of teaching and learner performance (Hogarty & Kromrey 2000: 10). This difference between their study and this one could be due to the fact that three of the four teachers in this study, were computer specialist teachers who were in charge of computer laboratory lessons throughout the whole school, in comparison to the Hogarty & Kromrey study which included all teachers in the schools. Observations in the respective classes sought to substantiate such responses of comfort and confidence by looking at how well the teachers responded to the technology and how well the teachers liked using the computer. Observational evidence suggests that teachers clearly enjoyed using the computer: Teachers' smiled a lot during the lessons, made no negative comments towards computers during lessons, and displayed a calm presence in the classroom. Data analysis revealed overall that the participant teachers were generally comfortable with using computers with no negative references to technology being made by any of the four teachers. However one of the teachers, Teacher 2, was undecided on three of the items:

My use of computer technology enhances learner performance	(Item 2)
I use computers effectively in my classroom	(Item 4)
I have had adequate training in using computers	(Item 8)

Her hesitation on these three items could be attributed to the fact that she is firstly a class teacher who has been put in charge of computers in Grade 7, where rest of the sample group of teachers are purely computer specialist teachers, who are trained and well experienced in the use of computers for educational purposes.

4.1.2. General Attitudes toward Computer Use

Teachers' general attitudes toward computer use were investigated in the questionnaire by means of a series of statements to which teachers indicated their agreement or disagreement. The results summarising the response frequencies by the four teachers are presented in the table below.

Table 5. General Attitudes toward Computer Use

Question	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1. I feel tense when people start talking about computers	1	3			
2. I avoid the computer whenever possible	3	1			
3. I feel pressure from others to integrate the computer more into my classroom	1	2		1	
4. Computers are dehumanizing		3			
5. The use of computers should be confined to computer courses	1	3			
6. Learning computers make high demands on my professional time	1	1	1		
7. Computers diminish my role as a teacher	2	2			
8. Computers further the gap between learners along socio economic lines		3		1	
9. I can help others solve computer problems			1	2	1
10. Computer skills are essential to my learners				2	
11. I would like every learner in my classes to have access to a computer				2	2
12. Computers should be incorporated into the classroom curriculum				2	1
13. I would like my learners to be able to use the computer more		1		2	1
14. Computers enhance classroom instruction				3	1
15. Computer skills will help me as a professional				1	3
16. More training would increase my use of the computer in the classroom		1			2
17. Computers make my job easier				1	2
18. Computers change my role as a teacher		2	1		1

Missing data:
Qu. 4 = 1; Qu. 10 = 2; Qu. 12 = 1; Qu. 16 = 1; Qu. 17 = 1

The teachers generally expressed very positive attitudes towards computer use and were in considerable agreement with each other. This can be seen in all items, except for *Items 3, 8, 13, 16 & 18* where a slight difference is evident.

> I feel pressure from others to integrate the computer more into my classroom *(Item 3)*

Computers further the gap between learners along socio economic lines	*(Item 8)*
I would like my learners to be able to use the computer more	*(Item 13)*
More training would increase my use of the computer in the classroom	*(Item 16)*
Computers change my role as a teacher	*(Item 18)*

A detailed look at *Item 18*, 'Computers change my role as a teacher', is broken down in the following table to further elicit individual teachers' responses.

Table 6. Computers Change My Role as a Teacher

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Teacher 1					1
Teacher 2			1		
Teacher 3		1			
Teacher 4		1			

What is interesting to note here is, teachers when asked in the interview if they could describe their role in the classroom when teaching with computers, acknowledged that computers created change in their role in the classroom during the lessons, which is in contrast to the predominant responses found in their questionnaires.

Teacher 4 saw changes in her teaching style and role in the classroom,

> It took me about a month to adapt to the style of teaching here, where you are no longer just standing up in front of the class and teaching, you are moving around the classroom assisting and motivating.

Teacher 2 also saw a change in her role as a teacher here.

> In the computer class I'm often learning from the kids, they know much more than I do– most of them, well a lot of them. They'll do something and if I'm stuck I'll ask the children because I do that at home. My son knows much more than me and he'll show me and I'll go slow down. And with the Grade 7's for instance, in the classroom, when we are doing something and then I'll say okay who knows how to do this and then they show me. So it's very much a reciprocal process of the students teaching me sometimes and me teaching them.

Furthermore Teacher 3 explained that teaching with technology allowed her to teach more as a facilitator.

> Definitely more a facilitator, because the learners are enthusiastic about what they are doing, and they are actively involved in their learning.

Teacher 1 described her role during a technology lesson in much the same way.

> They get their cue from me… then you see how they work it out and help them wherever is necessary. So the change comes in because you are facilitating the learning more, in place of instructing the entire lesson.

It appears from the above accounts that three of the four teachers saw their role more as a facilitator when using technology in a lesson. Perhaps this finding situated in this study, could bear some relation to a central tenet of Outcomes Based Education (which had a strong presence in C2005), of teachers as facilitators of learning. One could ask, why then is this facilitation of learning as strongly stated, happening only in the computer laboratory, when outcomes-based education is class-based? A possible reason could be that the programs are more constructivist, thus facilitating a more active role for the learners. However, what is apparent is that the findings of this item bear a strong connection to Gay's (1997) Doctoral Dissertation wherein the sample group of teachers described a change in their teaching role in the classroom, when using technology, towards one of facilitation. Further studies have also acknowledged such a role change (Clark, 2000; Keeler, 1996; Lockyer & Bennett, 1999).

In shifting focus to an item of agreement among the teachers, *Item 10*, 'Computer skills are essential to my learners', is confirmed by all four teachers through their interview data.

Teacher 4 and Teacher 2 reiterated their focus on computer skills to further equip Grade 7 learners.

> When we teach computers we focus on skills…. to equip them for high schools in what they might do. (Teacher 4)

> I just think that you can't do anything without computers anymore. I just don't think anyone can get by without a computer, so one has to know how to use the machine to get by. You have to know the skill to do as much as you can. (Teacher 2)

Teacher 3 and Teacher 1 also confirmed the importance of skills and their link-up with learning areas.

> We concentrate mostly on skills, and then incorporate it into the different learning areas. (Teacher 3)

> I have an idea of what I would like to cover computer skill wise and then link it up with the learning areas. (Teacher 1)

This also is established in the EPU (2000) study wherein South African teachers' attitudes towards computers in education revealed that the respondents held the view that computer skills are important in that they provide learners with greater job opportunities. Research carried out by Ertmer *et al.* (1999) has also gone on to show that teachers maintain learners need to use technology to be prepared for the future, while teachers from Reed's study (1986) maintained that "learners who had the opportunity to use computers in school would be more functional in the work force" (in Shiverdecker 2002: 24).

A further item, 'I would like my learners to be able to use the computer more' (*Item 13*), of considerable agreement among the teachers (n=3), falls in line with the qualitative study findings by Clark (2000) wherein teachers believed their classrooms should include more technology. While learners in the respective classes were using computers in the computer laboratory setting on average once a week for one hour, two of the schools (School C & School D) also had in place, one computer per classroom, which could account for the response of disagreement by Teacher 3. This finding aligns with research that indicates, learners should use the computer at least weekly and for at least 1-2 hours (British Educational Communications & Technology Agency, 2000), as it is argued that "access to computers is related to learners' performance" (Hardman 2002: 2).

4.1.3. The Integration of Computers into the Classroom

The results, presented in Table 7, give response frequencies for each statement with regard to why teachers integrate computers into the classroom.

Table 7. The Integration of Computers into the Classroom

Question		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1.	To promote student centred learning				2	2
2.	Independent learning				4	
3.	Individual instruction		1		3	
4.	To tutor			1	3	
5.	Small group instruction		2		1	
6.	Co-operative groups		2		1	
7.	As a problem-solving/decision making tool			1	3	
8.	As a research tool for students				2	2
9.	As a classroom presentation tool		1	1	1	
10.	As a productivity tool			1	1	2
11.	As a reward		1		2	
12.	As a communication tool				1	3

Missing data:
Qu. 5 = 1; Qu. 6 = 1; Qu. 9 = 1; Qu. 11 = 1

The four items which received positive responses from all four teachers were found to be:

To promote student centred learning *(Item 1)*
Independent learning *(Item 2)*
As a research tool for students *(Item 8)*
As a communication tool *(Item 12)*

Item 8 ('As a research tool for students'), is confirmed by two teachers' interview data, as they felt much focus in Grade 7 is placed on research work.

> So far this year, they have done a lot of research work... (Teacher 3)

> Another thing I've got in the pipeline is for someone to put up a server for me, which would be wonderful for the learners then all to access the Internet at the same time, from their computers. – so that they can use it for research and that is really important. (Teacher 1)

Furthermore 'Independent learning' (*Item 2*) is acknowledged by all teachers as an objective to integrate computers into the classroom. Observational data confirmed that all learners were involved in tasks at individual computers and were required to produce an individual piece of work at the end of each lesson, even though assistance and discussion between class members

was encouraged in all classes observed. The EPU study found too that South African teachers view computers as "tools to help learners think and work independently" (EPU 2000: 150).

Three reasons pertaining to integration of computers into the classroom which received the majority of 'disagree/strongly disagree' responses, were found to be:

Small group instruction	*(Item 5)*
Co-operative groups	*(Item 6)*
As a classroom presentation tool	*(Item 9)*

These findings from *Items 5 & 6* are surprising, given the documented evidence that grouping of learners around a computer, as opposed to working in isolation at individual computers, can have a positive effect on performance (Inkpen, 1997; Lou *et al.*). Others point out that using technology to promote collaborative activities can be a powerful motivator and can lead to better learning than relying on individual work (Roschelle *et al* 2000: 80) because "the degree to which classrooms are socially active and productive" can be enhanced by such uses and "can encourage classroom conversations that expand students' understanding of the subject" (Roschelle *et al* 2000: 80).

What is interesting to note in the table below, broken down into individual teacher responses for *Item 5* ('Small group instruction'), is that Teacher 2 indicates she integrates computers into the classroom for small group instruction, yet this could perhaps be explained by the fact that she takes only 15 learners at any one time for a computer-based lesson, due to the availability of only 15 workstations in the lab.

Table 8. Small Group Instruction

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Teacher 1		1			
Teacher 2				1	
Teacher 3		1			
Teacher 4					

Missing data:
Teacher 4 = 1

While on *Item 6* ('Co-operative groups'), two teachers disagreed with the intention to integrate computers into the classroom for co-operative groups and yet Teacher 3 stated in her interview that,

> ...at our school there is a lot of group and co-operative and working in partners and things like that and in the computer lab a lot of that happens as well

While true co-operative grouping was not evident in any of the classes observed, even though Teacher 2 had intimated in the questionnaire that this was her intention, it was found that learners were encouraged to assist one another where and when needed. Furthermore this finding brings to the fore the contradiction that teachers are expected to be working in a constructivist paradigm and yet three of the four teachers rate computers as a tool to learn to collaborate of little importance in the questionnaires. In terms of the South African context, wherein constructivism forms a part of the new curriculum, this finding leads one to ask a number of questions, i.e. if practice is different from principle, is it simply that lip service is paid to principle and in turn what are the implications for policy and teacher training? Consequently, further investigation is required here.

Table 9. Co-operative Groups

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Teacher 1		1			
Teacher 2				1	
Teacher 3		1			
Teacher 4					

Missing data:
Teacher 4 = 1

All teachers agreed/strongly agreed (n=4) that they integrate computers into the classroom as a communication tool. Akyurekoglu (2000) in identifying the perceptions of teachers at Miami Shore/Barry University Charter School of using computers in their classrooms, revealed that teachers viewed computers as communication tools, as well as teaching and classroom management tools.

A further noteworthy item, the sample group of teachers agreement, 'I integrate computers into the classroom to promote student centred learning' (n=4, Agreed/Strongly Agreed), is relevant in the context of the South African education system, as it ties in with the thinking around the principle of Outcomes Based Education (a central tenet of C2005), wherein focus has shifted from teacher-centred education to learner-centred pedagogy (EPU 2000: 23). Here the learner is encouraged to be a more active participant in his/her learning process, with the teachers' role becoming more supportive.

4.1.4. Usage

4.1.4.1. Optimum Computer Usage

Computers can and are being used for different purposes in education, as affirmed in the literature (Becker, 1993; EPU, 2000; Papert, 1980; Underwood & Underwood, 1990). Respondents were asked to indicate in order of priority, their perceived optimum use of computers with Grade 7 learners. The rank-ordering of priorities identified by teachers are presented in Table 10 with comments on individual factors numbered 1 and 2 available in Appendix C (Section 4, Table 7, p.113).

Table 10. Teachers' Perceptions of Optimum Computer Usage (ranked, from low (9) to high (1))

	Drill & Practice	Present-ation of assign-ments	Resear-ching projects	Games & Simula-tion	Problem solving	Data-bases	Word process-ing	Internet	Email
Teacher 1	9	2	7	8	1	4	3	6	5
Teacher 2	7	5	4	6			2	1	3
Teacher 3	6	2	1	7	8	9	3	4	5
Teacher 4	8	2	3	9	6	5	1	4	7

While the four teachers tended to rank their priorities of computer use differently to a point, what is interesting to note here though is how 'drill and practice' and 'games and simulation' are ranked between 6-9 by the respective teachers, indicating that these areas of computer usage are not seen as the best uses of computers. The recent study to investigate the nature and extent of ICT provisions in South African schools, conducted by the Education Policy Unit of the University of the Western Cape found that the most important purposes for which computers are used in Grades 1-7, were drill and practice followed by problem-solving exercises and presentation of assignments (EPU 2000: 84). A further smaller scale study (Morgan, 2001), of an independent South African school, found that researching on the Internet, followed by email, simulation and word processing, were the most commonly identified uses of computers in the classroom. Drill and practice was rated by just over 30 % of the sample as important, with games coming in only with 15 % of the sample's support (Morgan 2001: 55). An Australian study (Kershaw & Cousins, 1990) on the other hand, revealed that problem-solving was ranked as the best use of computer in the classroom, with drill and practice ranked last. While research literature reflects that predominance has been placed upon drill and practice usage in South

African schools (EPU, 2000), with the advent of the Revised National Curriculum which calls for the promotion of ICT in various ways in the different learning areas, it would appear that the sample group of teachers have started to promote the curriculum objectives (see Chapter 2, p.19).

Interview data here supports their intentions of linking skills and uses with learning areas:

> I'll find out what the teachers are doing in their classes and then decide on something that can compliment that or add to what they've done. (Teacher 3)

> For example, well their budget formed part of EMS, so I actually gave their finished spreadsheets to their EMS teacher and he actually linked them further. (Teacher 1)

> At the beginning of each term at this school the class teachers have to plan their next term work, so once that planning is done I ask for a copy of their term planner and then I base my lessons on what they are doing. I think this is an effective way because it is helping the learners academically. I also find if you are linking up with what they are doing in the classroom, you get more out of them when using the computer because they got the background knowledge. I find it does work. (Teacher 4)

However, while the above teachers in observing their lessons were indeed linking learning areas and computer skills, Teacher 2 stated her intention to try and do so, but lesson observations here revealed computer skills were being taught in isolation to learning areas. She intimated it was difficult to link due to the limited number of computers, as only half the class had access to computers at any given time.

> I'm trying to do something now with Afrikaans. The problem is using the room, because it only accommodates 15. (Teacher 2)

It would appear from the above findings that teachers (n=3) are generally viewing the computer as a tool which can be applied to a wide variety of educational activities (Taylor, 1980).

It is also interesting to note that while 'games' featured low in terms of teachers' views of optimum computer usage, observations in all four classroom settings revealed that games were being played in every lesson, usually once the main task/activity for the lesson had been completed and it was the teachers who were affording the learners opportunities to do so. However, concerns were expressed about learners playing games, in the one-on-one interviews.

Teacher 2 divulged her concern that the playing of games on computers can have a negative impact on learners academically and socially, as they become so involved and isolated.

> I mean I see the kids playing games and stuff, they just become totally on their own and they can shut out everything else and they become more and more – those hard children – you can just lose them totally and you don't even know that they are there. So here it's probably as a negative thing. (Teacher 2)

A further teacher, Teacher 3, expressed that learners responded well to the playing of games, yet there needs to be some control over what those games involve.

> Okay, if you give them free time or if they come in here on their own they mostly play games. That's normal, they love it and the more violent the games are the better, so you've got to be quite careful about what you allow them to bring in here… (Teacher 3)

Another item which proves pertinent in light of the literature is the fact that for some teachers (n=2) 'problem-solving' was not viewed highly in terms of optimum computer usage. Drenoyianni & Selwood (1998) and Kershaw & Cousins (1990) in contrast established that developing problem solving abilities was teachers' primary academic goal when using computers. Furthermore, the South African researcher Paul (1999) stresses the need to use computers for problem-solving, to develop and extend thinking.

In looking at the highly rated use of 'word processing' by all teachers concerned (ranked between 1-3), such findings appear to be consistent with studies conducted in Australian schools (Fitzgerald *et al.*, 1986; Kershaw & Cousins, 1990), where teachers perceived computers as advantageously used for word processing, for research and for administrative tasks. The predominance of the word processor has already been identified in other studies regarding computers use (Dunn & Ridgway, 1991a; MacArthur & Malouf, 1991).

Teachers' perceptions in this present study were also focused on the 'presentation of work', with three teachers ranking it second. Therefore the predominance of word processing in computer uses, cited by the respondents, would correlate with this. The same pattern was displayed in a study of teachers in the Leeds Local Education Authority, in which teachers indicated that they believed computers were very useful for word processing and in turn their focus was placed upon 'presentation of work' (Cuthill, 2001).

4.1.4.2. Importance of Computer Skills

The three most important computer skills as identified by the teachers are summarised in the table below.

Table 11. In Order of Priority, the Three Most Important Skills for Grade 7 Learners (1, highest, followed by 2 & 3)

	Basic principles of computers	Word processing	Spreadsheets	Presentation of graphics	File management	Database	Desktop Publishing	Web-design	Programming skills	Systems analysis and design	Ethics	Using the Internet	Information skills
Teacher 1	1	2			3								
Teacher 2		1										2	3
Teacher 3					3						1	2	
Teacher 4		1					3						2

In accordance with the results of teachers' perceptions of optimum computer usage, word processing is also highly considered as one of the most important skills pertaining to computer use. As one teacher stated,

> I think to actually teach them to use a keyboard rather than to write out everything is very important because the presentation in the end is much better, the spell check is a wonderful tool. (Teacher 1)

The results illustrated in the EPU (2000) study of computers in South African schools revealed that basic principles of computing, followed by word processing and information skills were viewed as the most important computer skills for Grade 4-7 learners. Other South African researchers, Morgan (2001) have reported that word processing is seen as the fourth most important skill, behind using the Internet, using email for communication purposes and simulations. The further ranking of the Internet (ranked second, n=2) and information skills (ranked second/third, n=2) by teachers, suggests in light of the uses of computers for much research in Grade 7, that these areas of skill development would likely be important. The mention by Teacher 3 of, 'Ethics', would also tie in with the area of researching, as she expressed it this way,

> Right at the beginning of the year we did quite a lot about research – evaluating web sites and things about bibliographies because it comes up a lot in their projects and they get it wrong every time, so bibliographies, and also about search engines, because once we'd done bibliographies I found that in their bibliographies they all writing google or yahoo. (Teacher 3)

4.1.5. The Importance of Computers

4.1.5.1. Importance of Computer Use

Table 12. The Importance of Computers

Question	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1. Computers are valuable tools that can be used to improve the quality of education.				1	3
2. The use of computers helps provide a better learning experience			1	1	2
3. It is important for learners to learn about computers in order to be informed citizens		1		3	
4. The use of the computer increases motivation in the learners toward learning			1	2	1
5. Computers stimulate creativity in learners			1	3	
6. Computers help learners to work with one another			1	3	

The results, which can be viewed in Table 12, give response frequencies for each question pertaining to the importance of computers. From the above table's results, it appears that the teachers were in considerable agreement with one another, with positive responses acknowledged by the majority of teachers on all items.

Item 4's findings of agreement or strong agreement with the statement (n=3), 'The use of the computer increases motivation in the learners toward learning', are similarly demonstrated by Berg *et al.* (1998), Bracely (1993) and Dunn & Ridgway (1991a, b) studies on teachers' perceptions and experiences with computers in schools. Research findings in the area of motivation of learners engaged in computer-based activities, have observed increased motivation for and focus on the learning task (Cox, 1997; Follansbee *et al.*, 1996; O'Hara, 1998; Richards, 1996; Trentin, 1996). However, "concerns have been raised, that such increases in motivation may arise from the novelty of computers in the classroom and therefore may be unsustainable in the long term" (Bennett & Lockyer 1999: 5).

In considering *Item 6*, 'Computers help learners to work with one another', interview data support teachers' responses on this item. Teacher 3 pointed out that this is well supported and encouraged in the computer lab.

> ...at our school there is a lot of group and co-operative and working in partners and things like that and in the computer lab a lot of that happens as well – if they can't do

> something instead of waiting for me to get there they'll ask somebody next door. I know when it comes to games and games that they like, I'll often say I have no idea how that works, and yes soon enough they'll find out from others and they share information. (Teacher 3)

Observational data revealed that while learners were encouraged in Teacher 3's classroom to discuss and work with one another, learners were however required to undertake tasks on individual computers. This was also observed in the other three classes, where learners although encouraged to discuss and work with one another, each had to complete their task on individual computers.

Items 1& 2, teachers further supported, that 'computers are valuable tools that can be used to improve the quality of education', while also providing a 'better learning experience'.

> The computer definitely adds value. You know with like the spreadsheets as well, just using formulas, I mean it would actually make sense to them, when they learning formulas in Maths – why do we need to learn these formulas? And they can actually see how they work out, on the computer. (Teacher 1)

> It does add value to learning in the different learning areas in some instances, and it also depends how the teacher uses it. (Teacher 3)

Item 3, 'It is important for learners to learn about computers in order to be informed citizens'. This was supported by the majority of the sample (n=3), however Teacher 3 disagreed.

The majority of teachers (n=3) agreement with the statement, 'computers stimulate creativity in learners' (Item 5), is interesting in light of the responses by the learners to a similar statement ('Using a computer allows me to be more creative and do things I have not been able to do in the past'). 80 % of learners indicated an agreement or strong agreement with this item (see discussion, p. 77). This would suggest that both learners and teachers are starting to view the use of the computer as an "effective tool in helping students learn higher-order skills involving creative or critical thinking about complex ideas" (in Shields & Behrman 2000: 20).

The results from this category seem to suggest that in Grade 7, the sample group of teachers feel technology is an integral part of the process of educating their learners. A qualitative

investigation of American middle school teachers (Clark 2000) has also identified similar beliefs held by teachers.

4.1.5.2. Objectives for Computer Use

The objectives for computer use identified by the respondents as being of utmost importance for learners in Grade 7, are indicated in order of priority in the table below.

Table 13. The Most Important Objectives for Computer Use as Perceived by the Teachers (ranked, from low (10) to high (1))

	Get information or ideas	Express self in writing	Mastering skills	Computer Skills	Analyse information	Remediation	Learn to Collaborate	Learn to work independently	Present Information to an audience	Communicate electronically
Teacher 1	5	9	1	3	4	6	10	8	7	2
Teacher 2	3	4	5	1	10	9	6	7	8	2
Teacher 3	1	4	5	6	9	7	2	8	10	3
Teacher 4	4	8	5	1	6	10	7	2	9	3

As is evident from the above table, there are a number of different priorities for which computers are used by teachers. However, it is worthwhile to note that 'communicate electronically' is highly viewed as an important objective (ranked 2-3) for computer use by the respondents. This finding could reasonably be expected, as it does seem to be the most obvious reason to use computers. Communicating electronically through email did however not form part of any of the lessons observed, yet the small number of observations could account for this. Results gleaned from other studies, one such conducted by Morgan (2001) at St. Stithians School divulged that 67 % of the teachers focus on the use of email in the classroom for communication purposes, while just ahead with 74 % of teachers, was the reported use of Internet in the classroom for research purposes. In comparison the large scale study by Becker (2000) established that teachers' primary objectives for computer use by learners was to get information or ideas (51 %), with 44 % viewing it as a way to express self in writing, with mastering skills and computer skills coming in with 37 and 32 % respectively. Communicating electronically was viewed by only 9% of the sample as important.

4.1.6. Computers for Learners

How do teachers think their learners respond to computers? The responses to this factor were overwhelmingly positive (Appendix C, Section 6, Table 1, p.116). All teachers (n=4) thought computers were important to their learners. Furthermore, all thought that their learners perceived computers as relevant, appealing, valuable, involving, and needed. However, on the factors of interesting, exciting, means a lot, and fascinating, Teacher 2 was undecided, while the majority of the sample indicated these factors were relevant to their learners. These findings are supported by previous research by Love (1993) of how 7th and 8th grade learners react to the presence of computers in their classroom. All teachers believed that their learners viewed computer use in the school as "the greatest thing since sliced bread" (Love, 1993). Similarly, Ertmer *et al.* (1999) have shown in their study that among a number of reasons, teachers perceived that computers were exciting and motivating for their learners; and that they made lessons more interesting to learners. In consulting the interview data collected for this study, teachers' responses to this question were also confirmed:

> They are definitely enthusiastic and positive. You would be amazed at how excited they get when they learn something new. (Teacher 4)
>
> They also are very enthusiastic about using the computer, which is wonderful. (Teacher 3)
>
> They love it, because I know that they are actually very disappointed when they miss the lesson. (Teacher 1)

Teacher 2 was able to extend upon her responses previously marked, 'undecided', in the questionnaire, stating she felt that for certain learners the use of the computer was seen as an unpleasant experience due to their lack of skills, while the majority of learners responded positively to being able to navigate the computer once the intended lesson tasks were completed.

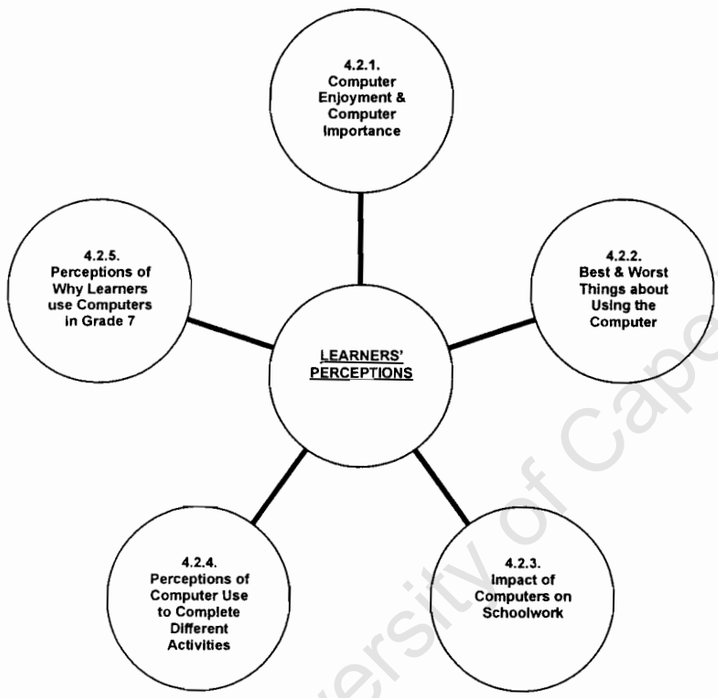
> I think that those who battle to type and have those skills not developed, they hate it. Because they can't keep up. But it's the other ones… once they've done the task and you've got the hang you can do whatever you like on the computer after that and they like that – then they can go and look for games and play games or go on the Internet or get mail or send mail and then they like that. (Teacher 2)

On observation in this classroom I found that Teacher 2 did not display a huge amount of enthusiasm for the type of work being undertaken with the learners and perhaps her lack of

enthusiasm for the task could account for her perception of the learners' responses to using computers. Activities and tasks tended to be isolated from learning areas, and lessons involved the teacher stipulating to the learners step for step what to do. For example, one such lesson involved the learners using Word to create tables within tables, and then to conclude the learners were asked to type the following sentence: "The quick brown fox jumped over the lazy dogs." This was to be copied 6 times changing each line with different fonts, sizes, colours and on the last sentence to replace the words using the thesaurus function. While this was being done the teacher sat at her desk marking tests.

4.2. LEARNERS' PERCEPTIONS

The questionnaire designed for the learners sought to elicit learners' perceptions of computers in Grade 7. While the questionnaire comprised four sections: computer enjoyment, computer importance, classroom environment, and usability, the questions and sections pertaining to learners' perceptions of computers will be analysed, with subsequent questions, providing the contextual data of the study (included in Chapter 3). The analysis process will consequently focus on the following categories in light of the questionnaire data and observations.



4.2.1. Computer Enjoyment & Computer Importance

Table 14 (below) lists the learners' responses to the four items on Computer Enjoyment and seven items on Computer Importance on the learner questionnaire. Although a high percentage of learners (86 %, n=103) agreed/strongly agreed that the use of the computer in lessons made 'schoolwork more enjoyable' *(Item 1)*, 38 % (n=40) of learners thought that the use of the computer did not make them 'feel more involved in the lessons' *(Item 4)*. In light of the

literature this is surprising as the characteristics of computer-based technologies make them a particularly useful tool for active, constructive learning (Roschelle *et al* 2000: 79). Furthermore, research findings in the area of motivation of learners engaged in computer-based activities, have revealed increased motivation for and focus on the learning task (Cox, 1997; Dwyer, 1994; Follansbee *et al.* 1996; O'Hara, 1998; Richards, 1996; Trentin, 1996;). The computer enjoyment trends by the sample group of learners suggest that the majority of learners enjoy using computers. Martin, Heller & Mahmoud's (1992) study of eight to twelve year old American and Soviet children also concluded that "kids like computers" (Martin, Heller & Mahmoud 1992: 181). On observation in the classrooms I found this finding to be true for the majority of learners, as they appeared to be responding well to the use of technology and appeared eager to use the technology as required by the lesson, as well as additional activities such as games or the Internet. Examples from lesson observations indicate:

> School C learners when on task (i.e. researching using Encarta 2002), talk revolved predominantly around the activity they were involved in.
>
> School A learners on entering the classroom, a sense of excitement and 'buzz' of talking between learners related to computer-based tasks.

Similar scenarios were observed in School B and School D.

Table 14. Learners' Perceived Computer Enjoyment and Computer Importance

COMPUTER ENJOYMENT	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1. Using computers in lessons makes schoolwork more enjoyable.		3 %	11 %	31 %	55 %
2. I concentrate on a computer when I use one.	2 %	8 %	16 %	49 %	24 %
3. Using a computer is difficult.	45 %	30 %	8 %	6 %	7 %
4. The use of the computer makes me feel more involved in the lessons.	2 %	8 %	23 %	34 %	29 %
COMPUTER IMPORTANCE					
5. I believe that it is very important for me to learn how to use a computer.	1 %	3 %	6 %	23 %	68 %
6. I know that computers give me opportunities to learn new things.	2 %		3 %	29 %	66 %
7. Computer skills will be essential to my working life.	1 %	3 %	10 %	28 %	58 %
8. Using a computer allows me to be more creative and do things I have not been able to do in the past.		6%	13 %	35 %	45 %
9. Computers have helped me produce work that I am really proud of.	3 %	3 %	17 %	35 %	43 %
10. I learn more quickly on a computer.	5 %	10 %	23 %	28 %	34 %
11. Using a computer allows me to work at my own pace.	3 %	12 %	13 %	29 %	43 %

Another interesting item to come from the data was that 86 % (n=103) of learners indicated their agreement or strong agreement with the statement 'computer skills will be essential to my working life' *(Item 7)*. This corresponds with international research (Behrman, 2000; Dooling, 2000; Kinnear, 1995; Tierney *et al.*, 1992) which reported learners' recognition that computer skills and knowledge are important for future competence and career goals. Additionally, this finding highlights the fact that learners appear to be aware of the reliance of the global economy on the use of technology, as ICTs have revolutionised the world in which we now live and work.

In terms of *Item 8*, 'Using a computer allows me to be more creative and do things I have not been able to do in the past', 80 % (n=96) of learners indicated their agreement or strong agreement. The same perception has been expressed in other studies. For example the British DfES (2001) study found that 81 % of learners thought computers allowed them to be more creative, while a South African independent school study (Morgan, 2001) revealed that, "57 % of learners believed that computers enhance creativity" (Morgan 2001: 63). The finding of my study ties in with the thinking around outcomes-based education wherein the focus has shifted to "developing problem-solving and creative environments through the use of new technologies; and integrating technology across various contexts in order to reach these goals (EPU 2000: 53)". This is further endorsed by Roschelle and colleagues who argue that computer based learning can be an "effective tool in helping students learn higher-order skills involving creative or critical thinking about complex ideas" (in Shields & Behrman 2000: 20). Observations in the classroom settings of the four schools revealed that learners in School A, School C and School D were involved in tasks which extended their creativity and thinking. For example:

School A: Learners were creating tables to analyse data collected from their investigations into how energy is being used in their school and the money being wasted.

School C: Learners were given the opportunity to create their own web quests[1].

School D: Learners were designing their own PowerPoint presentations around the theme of music and dance.

[1] "A web quest is an inquiry-oriented activity in which students interact with information gleaned primarily from resources on the Internet" (Dodge, 1997).

A further item accounting for a large percentage of respondents, 76 % (n=86), agreement with the statement, 'using a computer allows me to work at my own pace' *(Item 11)* is supported by the literature which suggests that "the computer is able to keep pace with the child's intellectual level" (Papert, 1981 in Greenfield, 1984) and that computers enable learners to "feel in control over their learning" (Druin & Solomon, 1996 in Vogelzang 1996: 6). This finding is further supported in the objectives of the New National Curriculum Statement underpinned by the principles of outcomes-based education, wherein learners' different learning paces are acknowledged and accommodated for, by only specifying the combination of minimum knowledge and skills to be achieved by learners at the *end* of each grade. Lesson observations here confirmed that learners for the most part were involved in common tasks at the computer which required initial teacher direction and thereafter learners undertook tasks at their own pace. An example is illustrated at School B, where learners were creating tables to analyze data collected from their investigations into how energy is being used in their school, and the money being wasted.

> School A, Learner 1, started set task at 11.10am and finished at 11.45pm, then moved onto an activity of her choice.
>
> While School A, Learner 3, started task at 11.10am and was still busy on task at 12pm.

Evidence of the allowance for different work paces, was also observed at School's B, C and D.

Learners' agreement (95 %, n=114) with the statement, 'I know that computers give me opportunities to learn new things' *(Item 6)*, confirms their thoughts of the use of computers as effective learning tools, while a sizeable agreement (62 %, n=74) with the statement that 'I learn more quickly on a computer' *(Item10)*, suggests that learners view computers as efficient learning tools. The literature suggests that the computer can be both an effective and efficient learning tool. Papert (1980) discerns that as a tool for learners the computer encourages them to "create their own knowledge and introduce them to the process of intellectual inquiry" (in Berg *et al.*, 1998). Furthermore, Underwood & Underwood (1990) feel that the computer as a tool, can build upon "out-of-school uses of the computer, with children participating in activities relevant to such environments as the electronic office and engaging in an exploration of knowledge" (Underwood & Underwood 1990: 24). Responses to 'I learn more quickly on the computer' are also interesting in light of the literature pertaining to computers, motivation and learning, wherein increased motivation for learning as a result of computer use has been

documented in several studies (Cox 1997; Follansbee *et al.*, 1996; Richards, 1996; Trentin, 1996), while a number of comprehensive national studies have observed the positive effect of computers on academic achievement (Renaud, 1998; van Daal & Reitsma, 2000; Zywno & Waalen, 2001).

4.2.2. Best & Worst Things about Using Computers

Table 15. Why Learners Like Undertaking Their Reported Best Activities on the Computer

Question	Entertaining	Not difficult	Efficient	Relaxing	Education	Other
Why do you like doing these things on the computer?	72 %	12 %	8 %	5 %	28 %	11 %

88 % of learners (n=106) reported playing games as the best activity when using the computer at school. Consequently comments taken from the questionnaire relating to 'why learners like undertaking their reported best activities on the computer' (Table 15) indicate that the majority of learners feel using computers is 'entertaining' (72 %, n=86). The second highest mention, using the Internet (65 %, n=78), would also account for the positive responses that computers are 'entertaining'. This perspective is supported by learners' comments from projects Plugged In and the Computer Clubhouse (Behrman, 2000) wherein learners reported that computers provided them with "entertainment" (Behrman 2000: 186), as they revealed their favourite activities to be playing games, surfing the web, drawing pictures and writing letters. On observation in the respective classrooms I found nearly all learners, once set tasks were completed, delighted in the playing of games, while the use of Internet in classrooms was also a favoured activity.

The Grade 7 learners were also asked what they disliked about computers (Table 16).

Table 16. What Learners Perceive as the Worst Things about Computers

Question	Viruses	Compu-ter malfun-ction	Typing	Difficult	Age of the com-puter	Time	Educa-tion	Nothing	Teacher	Other
What is the worst thing about computers? Why?	7 %	21 %	14 %	6 %	15 %	5 %	11 %	11 %	3 %	13 %

The main dislikes were related to the equipment: 21 % (n=25) of learners mentioned something to do with 'computer malfunction', while 15 % (n=18) of learners mentioned the 'age of the computer' (i.e. how old the computer was). Some 6 % (n=7) of learners said that they found it 'difficult' to use a computer. This is a very small number and could be perhaps related to the fact that most learners report having a computer at home. 14 % (n=17) of learners went on to mention the difficulty of 'typing'. A possible recommendation related to this perception could be for educators to find motivating ways to help their learners improve their typing or to harness related typing games that could help learners find typing a more enjoyable activity. Interestingly 11 % (n=13) of learners mentioned the worst thing about computers was using it for educational purposes, which could equate to the fact that what they are using the computer for at school is not always interesting to these learners (n=13). The UK DfES (2001) study similarly found that learners (7-11 years old) when asked what they disliked about computers, answers were related to the equipment being faulty (28 %), with the difficulty of using the computer (6 %) and difficulty in typing (4 %) also mentioned. Furthermore, a British study by Mumtaz (2001) reported technical errors made learners the most angry when using the computer in both the home and at school. Comparably the American study, Projects Plugged In and the Computer Clubhouse pointed out that difficulties and frustrations with the equipment itself (e.g. computers freezing, crashing, booting up, reacting to commands) were reported by the learners when using computers (Behrman, 2000). Observational data from my study confirmed that learners when encountered with computer malfunctions (i.e. computer freezes), learners of all computer interest ranges generally became frustrated. For example:

> School D, Learner 1, started to panic and called for the teacher in a distressed voice, "Its taking too long, not working!"
>
> School D, Learner 2, became worried and started pressing buttons on the computer and in turn called the teacher, using a distressed tone of voice and displaying negative body language (i.e. folding arms, head in hands).
>
> School D, Learner 3, frustrations were demonstrated through hands on her head and staring blankly at the screen.

Typing was also a cause of frustration for lower interest computer-using learners in classroom observations. This was reflected through:

School A, Learner 3, appeared to be struggling with her task, as she was unable to use the keyboard efficiently to insert her text. She said to the researcher that she finds the computer difficult to use.

School B, Learner 3, battled with finding the letters on the keyboard, and exclaimed time and again, "Ughh!"

School C, Learner 3, who mentioned in frustration to her friend, "I can't find the buttons quickly … the keyboard should have some sort of sound on it".

School D, Learner 3, concentrated hard when having to type, head down searching for keys on keyboard, used only his right hand to type, one finger, one letter at a time.

4.2.3. Impact of Computers on Schoolwork

All the learners were asked what effect using computers had on their work (Table 17). The main perceived benefits to the learners in Grade 7 was that the computer 'makes work easier' (80 %, n= 96), 'saves time' (74 %, n= 89), 'makes work more enjoyable' (73 %, n=88) and 'improves results/performance' (62 %, n=74). Comparably, the study Young People and ICT (2001) found that learners aged 11-14 years old, who use a computer at school, considered that computers made work more enjoyable (33 %), made work easier (31 %) and saved time (25 %), with 48 % stating no effect or don't know. The differences between this study and the study Young People and ICT (2001), clearly indicate that the sample group of Grade 7 learners in contrast to their British counterparts, strongly perceive the positive impact computers have on their schoolwork, consequently teachers and educators alike should be acknowledging such perceptions and harnessing the potential of the computer as a powerful motivational tool with their learners.

Table 17. Perceived Impact on Schoolwork

Question	Saves time	Makes work easier	Makes work more enjoyable	Improves results/ Perform-ance	Makes work less enjoyable	Takes more time	Other	No effect
What effect does the computer have on your schoolwork?	74 %	80 %	73 %	62 %	2 %	6 %	5 %	3 %

The perception that computers 'improve results/performance' (62 %, n=74) is noteworthy in that a number of large comprehensive national studies have investigated whether access to a computer or use of a computer in instruction does in fact improve academic achievement

(Ungerleider & Burns 2002: 4). Studies such as Statistics Canada in 1997 involving third graders and an American study involving fourth through eighth graders, have found no relationship between the presence of a computer in the classroom and the achievement of the learners (Johnson, 2000 in Ungerleider & Burns 2002: 4; Tremblay *et al.*, 2001). Onthe other hand there are studies which have reported "some indicators of a positive effect of computers on academic achievement" (Ungerleider & Burns 2002: 6). These include studies by Renaud (1998), van Daal & Reitsma (2000) and Zywno & Waalen (2001).

Furthermore 73 % (n=88) of learners perceived that the computer 'makes work more enjoyable'. A similar finding has already been reported in Table 14, *Item 1*. The previously consulted DfES (2001) study also concluded that learners (11-14 years old) were on the whole positive about computer use, with the feeling that using the computer was enjoyable (80 %), while in the study by Morgan (2001) 59 % of learners believed that computers increased academic interest (Morgan 2001: 63). The findings in this present study would seem to suggest that the sample group of learners are motivated by the use of the computer in the school environment. Research findings in the area of motivation of learners engaged in computer-based activities, have shown increased motivation for and focus on the learning task (Cox, 1997; Dwyer, 1994; Follansbee *et al.*, 1996; O'Hara, 1998; Richards, 1996, Trentin, 1996). However "concerns have been raised, that such increases in motivation may arise from the novelty of computers in the classroom and therefore may be unsustainable in the long term" (Bennett & Lockyer 1999: 5). Furthermore the Finnish study of learners between the ages of 11-18 years old, revealed a primary belief held by the 515 respondents that, "computer supported learning makes learning more meaningful and motivates one to study" (Hakkarainen *et al.* 2000: 103). While observing the learners in the computer laboratory setting for this study, I found that the majority of learners appeared to be enjoying their computer-based tasks, especially when it came to freedom of choice over activities, usually toward the end of the lesson once set tasks had been completed. In every classroom session observed, games were played after completion of the intended lesson activity, with an overwhelmingly positive response. What I did find though was that low interest computer-using learners were generally more interested in the playing of games, than the tasks to be completed. Two examples illustrate this:

School A, Learner 3, not at all interested in the task to be completed towards the end of the computer allocated time. Focuses more on the game her friend is playing. Getting up touching her friends' computer screen, who is playing the game, and giving pointers.

School B, Learner 3, interested in games his friend is playing while he is completing his work. Looking over at friend's computer suggesting strategies for game.

In comparison high interest computer-using learners appeared to enjoy their assigned tasks for the lesson and also went on to enjoy playing games and/or surfing the Internet.

On the issue of computers 'makes work easier" (80 %, n=96) the most subscribed to category, theorists such as Murphy & Greenwood (1998) afford some explanations for increased motivation in learners through the use of the computers, one being: "It can make learners more confident and able to challenge themselves more" (Murphy & Greenwood 1998: 414). This could in turn explain their aforementioned perception. Previous South African research (Morgan 2001: 63) has also gone on to show that learners believe computers 'make work easier' (68 %).

While the second most perceived impact of computers on schoolwork, 'saves time' (74 %, n=89), can be likened to a study conducted by Selwyn (2000) in five schools in South and Mid-Wales with primary school learners, one of the themes which emerged here, in line with my study, was the speed and ease of word-processors when using computers.

4.2.4. Perceptions of Computer Use to Complete Different Activities

Table 18. Learners' Perceptions of Using the Computer to Complete Different Activities in Grade 7

Question	Important	Interesting	Easy	Exciting	Means a lot	Needed
To me using the computer to complete different activities in Grade 7 is:	90 %	88 %	79 %	81 %	85 %	88 %

For learners in this study, using computers in Grade 7 is seen as important (90 %, n=108), interesting (88 %, n=106), easy (79 %, n=95), exciting (81 %, n=97), meaningful (85 %, n=102) and is needed (88 %, n=106). Clearly there was a great deal of satisfaction with computer use in the respective classes. This falls in line with how the sample group of teachers perceive their

learners' response to the use of computers (see Chapter 4, p. 73). This finding is intriguing in light of the study by Krendl & Broiheir (1992) who in examining learners' perceptions about computers in Grades 4-10, found that computer enjoyment tends to decline with familiarity. The sample group of learners in this study have however been using computers throughout their primary school career at least once a week, and while their perceptions of computer liking and enjoyment have not been measured throughout their exposure, their computer liking and enjoyment appear reasonably strong. This finding could however fall in line with earlier studies which have found that learners' level of confidence with technology has been seen to increase not decrease, as a result of practice and experience (Arndt *et al.*, 1985; Dalton & Hannafin, 1984; Dalton & Hannafin, 1985; Griffin *et al.*, 1986; Koohang, 1989; Moore, 1985). Moreover, studies have also demonstrated that primary school learners feel computers are a "good idea" (Kinnear 1995: 36) and show a high interest in using computers (Clarke 1989: 27). Comparably findings from the four year study, the Young Children's Computer Inventory (Knezek, Miyashita & Sakamoto, 1994) have shown that three or four years of computer exposure in primary school can have a measurable positive impact on children's attitudes toward computers, motivation and study habits (Knezek, Miyashita & Sakamoto 1994: 7). In all the classroom environmentsI observed, a large proportion of learners (estimated 76 % or more) appeared interested or motivated by the tasks undertaken on the computer. Learners' engagement of interest in the set task was sustained in School C (e.g. creating a web quest) and School D (e.g. creating a PowerPoint presentation) by nearly all of the learners for nearly all of the lesson. In School A and School B most of the learners engaged for around half of the time completing the task, with learners being engrossed in the playing of games, the other half of the lesson. The implication of this finding, where for half the time at two of the schools games were being played, is that the success of the integration of computers into classroom learning activities is fairly limited, with scope still evident for further integration.

4.2.5. Perceptions of Why Learners Use Computers in Grade 7

One of the major intents of my study was to ascertain learners' perceptions of why they use computers in Grade 7 (Table 19).

Table 19. Learners' Perceptions of Why They Use Computers in Grade 7

Question	High School	Future	Schoolwork	Learning	Skills	Efficiency	Other
Why do you think you use computers in Grade 7?	12 %	43 %	24 %	2 %	15 %	15 %	7 %

A striking finding in this area, that 43 % (n=51) of learners see the use of the computer in Grade 7 as preparation for their future, coupled with the responses relating to the preparation for high school (12 %) and the development of skills (15 %, n=18), points out that computer usage and skills are clearly seen as a necessity for their futures. It further suggests that the sample group of learners are aware of the global economic thrust wherein technology "has increasingly come to be seen as central to all forms of development, especially economic development" (Muller 2000: 26) and in turn education and the development of technological skills are clearly seen as important in order to participate productively in the workforce. This finding is replicated in Behrman (2000) wherein the computer is viewed by primary school learners as "a vehicle leading toward present and future competence, autonomy and empowerment". The learner data here (Future = 43 %, n=51 and Skills = 15 %, n=18) also reinforces the findings in Table 1,*Item 7* ('Computer Skills will be essential to my working life').

The fact that 'schoolwork' is highlighted by 24 % (n=29) of learners as a reason for using computers in Grade 7 is not surprising, given that this is what the computer in the school environment is predominantly used for. 15 % (n=18) of learners view using the computer in Grade 7 as a means of 'efficiency'. As discussed earlier, the computer is supported by particular theorists as an efficient and effective learning tool (Papert, 1981). This finding here also agrees with the findings by Selwyn (2000) wherein learners made mention of the speed and ease of using computers with special reference placed upon word-processors.

CHAPTER FIVE

CONCLUSION

The purpose of this chapter is to present a summary of the major findings of the study. It discusses the limitations of the study and recommends areas for further research.

5.1. INTRODUCTION

During the past twenty years, a great deal of attention has been paid to the examination of the effects of computers on learners, the influence of computers on learning, problem-solving and achievement as well as other aspects of schooling (as cited in Lauman 2000: 2), with little attention afforded to address individuals' perceptions of the technology. Given the great investments by schools, due to high expectations concerning the educational benefits of computers, it is important that such research be conducted. The study set out to explore 'teachers' and learners' perceptions from four ex-Model C primary schools on how and why computers are used in the Grade 7 classroom'. This study is unique in that it looked at the perceptions of both teachers and learners in one study, with a focus on the South African schooling context where little research has been conducted in this area.

5.2. MAJOR FINDINGS OF THE STUDY

The research contained two components: 'Teachers' views on how and why computers are used in the Grade 7 classroom'; and 'Learners' views on how and why computers are used in the Grade 7 classroom'.

It is evident from the findings of this study that the majority of the participating teachers were comfortable with using computers and expressed positive attitudes toward computer use. All mentioned integrating the computer into the classroom to promote student centred learning, independent learning, as a research tool and as a communication tool. 'Word processing' was highly rated by the teachers as one of the optimum uses of the computer in Grade 7, along with

the 'presentation of work'. In accordance with the aforementioned results, teachers placed importance on 'word processing' skills. The sample group of teachers perceived technology as an integral part of the process of educating their learners. With regard to important objectives for computer use, all teachers mentioned using the computer for communication purposes. Furthermore all believed their learners' perceived the computer as important, relevant, appealing, valuable, involving and needed.

Findings from the learner data revealed that the majority of learners expressed enjoyment with using the computer in Grade 7, while the importance of computers as learning tools was affirmed by a large percentage of the sample. Learners also perceived that when undertaking activities they enjoyed on the computer, they found the computer to be 'entertaining', while the worst thing about the computer was perceived to be 'computer malfunctions' and 'the age of the computer' (i.e. how old the computer was). Furthermore most learners viewed the computer as having a positive impact on their schoolwork (i.e. saves time; makes work easier; makes work more enjoyable; improves results/performance). A great deal of satisfaction with computer use in the respective classes was reported by the learners, as a large percentage perceived it to be important, interesting, easy, exciting, meaningful and needed, which falls in line with how the sample group of teachers perceived their learners respond to the use of computers. Finally the data suggests on the issue of why learners think they use computers in school, that the preponderance of learners feel that the computer is used for preparation for their future.

The results confirm particular findings from international studies (Becker, 2000; Behrman, 2000; DfES, 2001; EPU, 2000; Martin *et al.*, 1992; Morgan, 2001 to name a few) and add to our knowledge, particularly in the area of teacher and learner perceptions of technology in the South African ex-Model C primary school context. What is encouraging from the findings from this study is that computers are being positively received by both the teachers and learners in these contexts. This wide acceptance of computers by participants provides confirmation and recommendation that the computer can foster excitement in learning among the majority of these learners and that the teachers feel accordingly positive about its uses within their school contexts. Schools in this study should accordingly be making the most of their computer-allocated times and continue to, or start to offer, further access to learners through computer clubs, classroom computer access, lunchtime and break-time access.

5.3. LIMITATIONS OF THE STUDY

The present study has several limitations, one being that it focuses on a small sample of Grade 7 primary school teachers and learners, from the previously advantaged Model C schooling classification system. Therefore, the results may not be generalisable to teachers and learners at other levels. Additionally because the teachers and learners were not randomly selected from the population of teachers and learners, the results may not be generalisable to all teacher and learner populations either. However, it was not the goal of this proposed study to be able to make generalisations, but rather to offer understanding or insight into the perceptions of these teachers and learners.

Furthermore in adopting the use of a questionnaire, individual perceptions have been channelled by questionnaire guidelines. Perhaps motivation or reasoning behind each response in the questionnaire could have been requested from the participants to develop a deeper understanding of learners' perceptions of computers. Conducting interviews would possibly have yielded richer and more findings. The study also undertook only two lesson observations per school. For stronger validity and reliability more lesson observations could have been organized.

5.4. RECOMMENDATIONS FOR FURTHER RESEARCH

This study was limited by its small subset of teachers and learners and the time period in which to complete the research. However it is a starting point as there is a definite need for research in this area, particularly in South Africa. Much of the research reviewed in this study has been conducted outside of South Africa. Although such information is useful, it does not provide a uniquely South African perspective. Further South African research involving teachers' and learners' perceptions of computers are warranted in a number of associated areas which may result in a better understanding of both teachers' and learners' perceptions of computer use in our schooling context:

- Studies dealing with teachers' and learners' perceptions of computers should be repeated with a larger and more representative sample.
- Studies need to also look at class teachers and their learners in classrooms where the computer is integrated into the daily teaching and learning processes.

- Cross cultural research on teachers' and learners' perceptions of computers is an important area of research.
- Further studies also need to examine the role of gender and grade level in determining learners' responses to the technology.
- Longitudinal research from a larger representative sample could focus on the evolution of learners' responses to computers over an extended period of time, which could provide researchers with evidence to assess the magnitude and substance of any sort of novelty effects related to computers, as well as understand how the role of the computer-users' perceptions of them have changed over time as the technology has become more firmly established in our schools.
- A further intriguing avenue of research would be to conduct a systematic comparison of in-school responses to computers with out-of-school responses (i.e. learners' use of computers at home).
- Certain teacher comments (Appendix C, Section 7, Table 3, p.117) from the questionnaires ("How would you like Information Technology in your classroom/school to develop") indicate that the following areas warrant investigation:
    - Studies looking at the type of teacher training and help needed with integrating the computer into the classroom.
    - Further studies looking at how teachers go about integrating computers into the classroom. Understanding the process that teachers go through to infuse technology into their instruction is essential to help facilitate the successful integration of computers into classrooms (Gay, 1997).

These are just a few possible issues for further study. As technology continues to take on a more significant role in South African schools, it is suggested that studies of this nature be conducted in our schools. Rigorous research in such areas would be useful to educators, policy makers and researchers alike, as this could subsequently lead to better understandings of what learners think about computers in the school context, as well as how teachers feel about it. What can be concluded is that there is still much to be learnt about the way teachers and learners perceive computer use in their classrooms. Further research might be the only way to address such issues.

5.5. FINAL THOUGHTS

We cannot escape the reality that computers exist as an integral part of our society, and that as technology rapidly advances they will continue to take on an even larger function in our future. What we can conclude, is that technology has progressed to the point today where the world is dependent on it. We are therefore witnessing the implementation of technology into our schools of the 21st century. While the use of computers in schools is becoming more ubiquitous and even inevitable, the findings of this study afford us a glimpse into how a sample group of teachers and learners perceive their uses in the Grade 7 context.

One should identify and address teacher and learner perceptions toward computers in the school context, so that we as educators and researchers addressing the influx of computers into our schools will be in a better position to understand how these technologies are experienced by the very people using and experiencing them. Akbaba & Kurubacak (1998) maintain, "It is important for us as educators to understand teachers' perceptions towards computers as an educational instrument for providing relevant technologies and integrating them in curriculum." Clark (2000) further purports,

> We must understand what is important to the people who provide direct instruction to our children. This information can help educational leaders provide relevant technologies to teachers that they will understand, use, and integrate into their classrooms. (Clark 2000: 10).

The voices of learners on the other hand "can help enrich and enlighten discussion of the role of technology in their lives. We should take time to listen" (Behrman 2000: 187).

The important contribution of this study is that it has provided a window into how four South African teachers and 120 learners perceive the use of computers within the context of the Grade 7 classroom. I believe that unless we do not recognize teachers' and learners' perceptions towards computers and related technologies, we can not truly begin to understand whether the intended educational benefits of such tools have a chance to fulfil the expectations placed upon them, since one's perceptions and attitudes can and very often do bear an influence on future use of and behaviour toward computers (Fann *et al.*, 1988-89; Levine & Donitsa-Schmidt, 1997; Woodrow, 1991), acceptance of computers (Fann *et al.*, 1988-89) and use of computers in optional circumstances (Selwyn, 1997).

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APPENDIX A – Teacher Demographics Tables

TEACHER DEMOGRAPHICS OF THE STUDY

Table 1. Demographics of teachers completing the questionnaire

Teacher	Grade	Years Teaching	Age	Gender	Language	Computer at home	Use of home computer	Training	No. of yrs since 1st computer training
Teacher 1	7	15+	41-45	Female	English	Yes	Everyday	Yes	7
Teacher 2	7	15+	41-45	Female	English	Yes	Everyday	Yes	8
Teacher 3	7	11-15	31-35	Female	English	No	-	Yes	5
Teacher 4	7	15+	41-45	Female	English	Yes	Everyday	Yes	10

Table 2. Type of computer training teachers received

Type of computer training	n
Basic Computer Literacy	3
Computer Applications	4
Computer Integration	1

Table 3. Where training received from

Training received from	n
Self-taught	2
School district	2
College or university	0
Other	3

Table 4a. Experience with computers

Teacher	Never use a computer & don't plan to anytime soon	Never used a computer but would like to learn	Use applications like word processing, spreadsheets, etc.	Use computers for instruction in the classroom
Teacher 1				1
Teacher 2			1	
Teacher 3				1
Teacher 4				1
TOTAL			**1**	**3**

Table 4b. Frequency of computer use for instruction in the classroom

Teacher	Daily	Weekly	Occasionally
Teacher 1	1		
Teacher 2			
Teacher 3	1		
Teacher 4	1		
TOTAL	**3**		

Spoilt data:
Teacher 2

APPENDIX B – Learner Demographics Tables

LEARNER DEMOGRAPHICS OF THE STUDY

GENDER	FEMALE	MALE	TOTAL
School A	19	11	30
School B	11	15	26
School C	15	17	32
School D	19	13	32
TOTAL	**64**	**56**	**120**

LANGUAGE	ENGLISH	AFRIKAANS	XHOSA	ZULU	SETSWANA	GREEK	ITALIAN
School A	22	1	4		1	1	1
School B	22		4				
School C	27		2	1			
School D	32						
TOTAL	**103**	**1**	**10**	**1**	**1**	**1**	**1**

HOME COMPUTER	YES	NO
School A	23	4
School B	18	8
School C	27	5
School D	28	4
TOTAL	**96**	**21**

Missing data:
Language: School C = 2
Home computer: School A = 3

Computer use at home:

	EVERYDAY	ONCE A WEEK	LESS OFTEN	NEVER	DON'T KNOW
School A	14	4	3		3
School B	12	5	1		
School C	18	6	1		2
School D	17	9	2		
TOTAL	**61**	**24**	**7**	**0**	**5**

Missing data:
School A = 2

APPENDIX C – Teacher Questionnaire Tables

TEACHER QUESTIONNAIRE DATA FROM FOUR SCHOOLS

Section 1 - Level Of Comfort/Confidence and Experience With Computers

Table 1. Teachers Level of Comfort/Confidence and Experience with Computers

Question	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1. I am comfortable using computers during classroom instruction				1	3
2. My use of computer technology enhances learner performance			1	1	2
3. Incorporating computers into lessons enhances teaching				2	2
4. I use computers effectively in my classroom			1	1	2
5. I am developing expertise in the use of computers in the classroom				2	2
6. I am comfortable giving computer-related tasks to my learners				2	2
7. I am comfortable with computer terminology				2	2
8. I have had adequate training in using computers			1	2	1

Section 2 - General Attitudes toward computer use

Table 1. General Attitudes toward computer use

Question		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1.	I feel tense when people start talking about computers	1	3			
2.	I avoid the computer whenever possible	3	1			
3.	I feel pressure from others to integrate the computer more into my classroom	1	2		1	
4.	Computers are dehumanizing		3			
5.	The use of computers should be confined to computer courses	1	3			
6.	Learning computers make high demands on my professional time	1	1	1		
7.	Computers diminish my role as a teacher	2	2			
8.	Computers further the gap between learners along socio economic lines		3		1	
9.	I can help others solve computer problems			1	2	1
10.	Computer skills are essential to my learners				2	
11.	I would like every learner in my classes to have access to a computer				2	2
12.	Computers should be incorporated into the classroom curriculum				2	1
13.	I would like my learners to be able to use the computer more		1		2	1
14.	Computers enhance classroom instruction				3	1
15.	Computer skills will help me as a professional				1	3
16.	More training would increase my use of the computer in the classroom		1			2
17.	Computers make my job easier				1	2
18.	Computers change my role as a teacher		2	1		1

Missing data:
Qu. 4 = 1
Qu. 10 = 2
Qu. 12 = 1
Qu. 16 = 1
Qu. 17 = 1

Section 3 - The Integration of computers into the classroom

Table 1. The Integration of computers into the classroom

Question		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1.	To promote student centered learning				2	2
2.	Independent learning				4	
3.	Individual instruction		1		3	
4.	To tutor			1	3	
5.	Small group instruction		2		1	
6.	Cooperative groups		2		1	
7.	As a problem solving/decision making tool			1	3	
8.	As a research tool for students				2	2
9.	As a classroom presentation tool		1	1	1	
10.	As a productivity tool			1	1	2
11.	As a reward		1		2	
12.	As a communication tool				1	3

Missing data:
Qu. 5 = 1
Qu. 6 = 1
Qu. 9 = 1
Qu. 11 = 1

Section 4 - Usability

Table 1. Learners engage, per week, in computer-based activities for curricular purposes:

	1 hr/less than 1 hr	Between 2 & 4 hrs	More than 4 hrs
Teacher 1	1		
Teacher 2	1		
Teacher 3	1		
Teacher 4		1	

Table 2. The learning areas in which computers are used in teaching and learning.

	Language	Maths	Natural Sciences	Techno-logy	Social Sciences	Economic & Manage-ment Sciences	Arts & Culture	Life Orienta-tion	Other
Teacher 1	*	*		*		*	*		
Teacher 2				*				*	*
Teacher 3	*	*	*	*	*	*		*	
Teacher 4	*	*	*		*	*			

Table 3a. In order of priority, two learning areas where learners make the most use of computers.

	Language	Maths	Natural Sciences	Techno-logy	Social Sciences	Economic & Manage-ment Sciences	Arts & Culture	Life Orienta-tion	Other
Teacher 1	2	1							
Teacher 2				1					2
Teacher 3	1	2							
Teacher 4	1				2				

Table 3b. In order of priority, two learning areas where learners make the most use of computers.

	CHOICE 1	CHOICE 2
Teacher 1	Mathematics	Language
Teacher 2	Technology	Other (Project Research)
Teacher 3	Language	Mathematics
Teacher 4	Language	Social Sciences

Table 4. The purposes for which computers are used in Grade 7

Purposes	n
Drill & practice	4
Presentation of assignments	4
Researching Projects	4
Games & simulation	4
Problem solving	3
Databases	3
Word processing	4
Internet	4
Email	4

Table 5a. In order of priority, the two most important purposes for which computers are used.

	Drill & Practice	Presenta-tion of assignments	Research-ing projects	Games & Simulation	Problem solving	Databases	Word processing	Internet	Email
Teacher 1		2			1				
Teacher 2							2	1	
Teacher 3		1	2						
Teacher 4			2				1		

Table 5b. In order of priority, the two most important purposes for which computers are used.

	CHOICE 1	CHOICE 2
Teacher 1	Problem solving	Presentation of assignments
Teacher 2	Internet	Word processing
Teacher 3	Presentation of assignments	Researching Projects
Teacher 4	Word processing	Researching Projects

Table 6. Teachers' perceptions of optimum computer usage (ranked from 1-9)

	Drill & Practice	Present-ation of assign-ments	Resear-ching projects	Games & Simula-tion	Problem solving	Data-bases	Word process-ing	Internet	Email
Teacher 1	9	2	7	8	1	4	3	6	5
Teacher 2	7	5	4	6			2	1	3
Teacher 3	6	2	1	7	8	9	3	4	5
Teacher 4	8	2	3	9	6	5	1	4	7

Table 7. Teachers' comments on their factors numbered 1 and 2

Teacher 1	Pupils need to find the best way of fulfilling tasks and how to override difficulties which may occur. I also believe that the use of computers makes for a more professional presentation of assignments.
Teacher 2	*Access to vast info/latest ideas quickly *Most common/available for most aspects in life.
Teacher 3	Much of their learning takes the form of project work which has to researched and presented in one form or another.
Teacher 4	These skills are widely used in the workforce.

Table 8. Teachers' priorities regarding computer utilization at their school.

	Use of computers as a teaching & learning tool in all learning areas	To teach computer skills	To expose learners to the potential benefits of computers in everyday life	Other
Teacher 1			1	
Teacher 2		1		
Teacher 3	1			
Teacher 4		1		

Table 9. Teachers believe the level of engagement with computer-based tasks for Grade 7 learners is ...

	Very difficult	Difficult	Just right	Easy	Very easy
Teacher 1			1		
Teacher 2			1		
Teacher 3			1		
Teacher 4			1		

Could you explain why?

Teacher 1	They have almost all been using computers since Grade 1 and are given task relevant to their level of competency at this stage.
Teacher 2	-
Teacher 3	It depends on the task – creating a Database or PowerPoint presentations are more difficult than creating a Word document.
Teacher 4	Lessons in the ICT Centre are designed for specific ages and are also integrated. Different levels of capability are also taken into account when planning lessons.

Table 10. The way in which learners in Grade 7 use computers.

	For individual work	For group / collaborative work	For both	Other
Teacher 1	1			
Teacher 2	1			
Teacher 3			1	
Teacher 4			1	

Table 11. Computer skills taught to the Grade 7 learners

Computer skills	n
Basic principles of computers	4
Word processing	4
Spreadsheets	4
Presentation graphics	4
File management	3
Database	2
Desktop publishing	3
Web-design	1
Programming skills	0
Systems analysis and design	0
Ethics (acceptable use, plagiarism, hacking	2
Using the Internet (email, world-wide web)	4
Information skills (research on CD-ROMS, Internet)	4
Other (specify)	0

Table 12a. In order of priority, the three most important skills for Grade 7 learners

	Basic prince-ples of com-puters	Word process -sing	Spread-sheets	Presen-tation of graphic s	File manage-ment	Data-base	Desktop Publish-ing	Web-design	Progr-amming skills	Systems analysis and design	Ethics	Using the Internet	Inform-ation skills
Teacher 1	1	2			3								
Teacher 2		1										2	3
Teacher 3					3						1	2	
Teacher 4		1					3						2

Table 12b. In order of priority, the three most important skills for Grade 7 learners

	CHOICE 1	CHOICE 2	CHOICE 3
Teacher 1	Basic principles of computers	Word processing	File management
Teacher 2	Word processing	Using the Internet (email, world-wide web)	Information skills (research on CD-ROMS, Internet)
Teacher 3	Ethics (acceptable use, plagiarism, hacking)	Using the Internet (email, world-wide web)	File management
Teacher 4	Word processing	Information skills (research on CD-ROMS, Internet)	Desktop Publishing

Table 13. Teachers perceived difficulties of using computers in the classroom (ranked from 1-6).

	Not enough computers available in classrooms	Insufficient funds available for purchase of equipment	Little known about how children learn when using computers	Teachers have to give up important preparation time to become familiar with computers	Not enough teachers with both teacher & specialised training - key resource people	Lack of suitable in-service courses for teachers
Teacher 1	4	5	6	2	3	1
Teacher 2						
Teacher 3	6	3	2	1	4	5
Teacher 4						

Spoilt data:
Teacher 2

Missing data:
Teacher 4 (stated no difficulties)

Section 5 – Importance of computers

Table 1. The importance of computers

Question	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1. Computers are valuable tools that can be used to improve the quality of education.				1	3
2. The use of computers helps provide a better learning experience			1	1	2
3. It is important for learners to learn about computers in order to be informed citizens		1		3	
4. The use of the computer increases motivation in the learners toward learning			1	2	1
5. Computers stimulate creativity in learners			1	3	
6. Computers help learners to work with one another			1	3	

Table 2. The most important objectives for computer use as perceived by the teachers (Ranked from 1-10).

	Get informa-tion or ideas	Express self in writing	Mastering skills	Computer Skills	Analyse informa-tion	Remedia-tion	Learn to Collabor-ate	Learn to work indepen-dently	Present Informa-tion to an audience	Commu-nicate electro-nically
Teacher 1	5	9	1	3	4	6	10	8	7	2
Teacher 2	3	4	5	1	10	9	6	7	8	2
Teacher 3	1	4	5	6	9	7	2	8	10	3
Teacher 4	4	8	5	1	6	10	7	2	9	3

Section 6 – Computers For Learners

Table 1. Teachers perceived that for their learners using computers in the classroom is:

1.	IMPORTANT	UNDECIDED	UNIMPORTANT
Teacher 1	1		
Teacher 2	1		
Teacher 3	1		
Teacher 4	1		
2.	BORING	UNDECIDED	INTERESTING
Teacher 1			1
Teacher 2		1	
Teacher 3			1
Teacher 4			1
3.	RELEVANT	UNDECIDED	IRRELEVANT
Teacher 1	1		
Teacher 2	1		
Teacher 3	1		
Teacher 4	1		
4.	EXCITING	UNDECIDED	UNEXCITING
Teacher 1	1		
Teacher 2		1	
Teacher 3	1		
Teacher 4	1		
5.	MEANS NOTHING	UNDECIDED	MEANS A LOT
Teacher 1			1
Teacher 2		1	
Teacher 3			1
Teacher 4			1
6.	APPEALING	UNDECIDED	UNAPPEALING
Teacher 1	1		
Teacher 2	1		
Teacher 3	1		
Teacher 4	1		
7.	FASCINATING	UNDECIDED	MUNDANE
Teacher 1	1		
Teacher 2		1	
Teacher 3	1		
Teacher 4	1		
8.	WORTHLESS	UNDECIDED	VALUABLE
Teacher 1			1
Teacher 2			1
Teacher 3			1
Teacher 4			1
9.	INVOLVING	UNDECIDED	UNINVOLVING
Teacher 1	1		
Teacher 2	1		
Teacher 3	1		
Teacher 4	1		

10.	NOT NEEDED	UNDECIDED	NEEDED
Teacher 1			1
Teacher 2			1
Teacher 3			1
Teacher 4			1

Section 7 – Individual responses

Table 1. Teachers' perceived benefits for learners in using computers.

Teacher 1	I think this has been covered in previous questions.
Teacher 2	Stay with technology and uses. Important for business and everyday life.
Teacher 3	Their thoughts are more easily organised. Changes can be made quickly. It's a skill they will need in the business world. Layout and presentation of tasks is organised and well laid out.
Teacher 4	Preparation for the workforce. When guided correctly, the learner who does not enjoy reading, is "forced" to read.

Table 2. Teachers' perceived disadvantages for learners in using computers.

Teacher 1	They could become too dependent on computer generated material and lose some of their personal creativity. I also feel that some games are particularly addictive.
Teacher 2	Only lack of computers leads to being disadvantaged in class.
Teacher 3	Often makes them lazy about looking for information and putting it into their own words.
Teacher 4	No disadvantages.

Table 3. Teachers' views on how Information Technology in their classroom/school could be developed or alternatively be reduced.

Teacher 1	I am very happy with way the IT is developing, but would like them to be able to access Internet from their own workstations simultaneously. I should also like the opportunity to broaden my personal knowledge.
Teacher 2	New here – so don't know complete involvement.
Teacher 3	Teachers need more training and help with integrating the use into the classroom.
Teacher 4	-

APPENDIX D, 1 – Learner Questionnaire Tables with Counts

SECTION 1 & SECTION 2

Table 1. Learners perceived computer enjoyment and computer importance

COMPUTER ENJOYMENT	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1. Using computers in lessons makes schoolwork more enjoyable.		4	13	37	66
2. I concentrate on a computer when I use one.	2	9	19	59	29
3. Using a computer is difficult.	54	36	9	7	8
4. The use of the computer makes me feel more involved in the lessons.	2	10	28	41	35
COMPUTER IMPORTANCE					
5. I believe that it is very important for me to learn how to use a computer.	1	3	7	27	82
6. I know that computers give me opportunities to learn new things.	2		4	35	79
7. Computer skills will be essential to my working life.	1	3	12	33	70
8. Using a computer allows me to be more creative and do things I have not been able to do in the past.		7	16	42	54
9. Computers have helped me produce work that I am really proud of.	3	4	20	42	51
10. I learn more quickly on a computer.	6	12	28	33	41
11. Using a computer allows me to work at my own pace.	4	14	16	35	51

Missing data:
Qu. 2 = 2; Qu. 3 = 6; Qu. 4 = 4; Qu. 7 = 1; Qu.8 = 1

SECTION 3

Table 1. Learners' perceptions of the classroom environment

CLASSROOM ENVIRONMENT	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
12. I'm encouraged to solve any problems that come up when I'm using the computer	3	15	24	40	37
13. I am usually confused about what to do during computer time.	50	38	11	11	6
14. I am not happy with what is done when we use computers.	54	35	21	8	2
15. My teacher is always able to help me on the computer.	4	12	6	36	62

Missing data:
Qu. 12 = 1

SECTION 4

USABILITY

Table 1. Learners claimed frequency of using computers in school

	1 hr/less than 1 hr	Between 2 & 4 hrs	More than 4 hrs
How much time do you spend on the computer at school during lessons, per week?	78	36	4

Missing data:
n=2

Table 2. With whom learners report using a computer with at school

	Friends in class	Other children	Teachers	On your own	Other grown-ups
Who do you usually use a computer with when you're at school?	65	21	35	65	4

Table 3. Reported Activities undertaken on the computer at school by learners

	Playing games	Draw pictures	Typing	Send / receive emails	Use the Internet	Use educa-tional CD-ROMS	Watch films / DVD's	School Projects	Don't Know	Other
What type of things do you do on the computer at school?	102	36	101	68	99	36	6	105		11

Missing data:
Qu. 18a = 1; Qu. 18b = 1; Qu. 18c = 1; Qu. 18d = 1; Qu. 18e = 1; Qu. 18f = 1; Qu. 18g =1; Qu. 18h = 1; Qu. 18i = 1; Qu. 18j = 1

Table 4. Reported best activities undertaken on the computer at school by learners

	Playing games	Draw pictures	Typing	Send / receive emails	Use the Internet	Use educa-tional CD-ROMS	Watch films/DVD's	School Projects	Don't Know	Other
What do you like doing best on the computer at school?	106	26	35	62	78	10	16	34	2	7

Missing data:
Qu. 19a = 1; Qu. 19b = 1; Qu. 19c = 1; Qu. 19d = 1; Qu. 19e = 1; Qu. 19f = 1; Qu. 19g = 1
Qu. 19h = 1; Qu. 19i = 1; Qu. 19j = 1

Table 5. Why learners like undertaking the reported best activities on the computer

Question	Entertaining	Not difficult	Efficient	Relaxing	Education	Other
Why do you like doing these things on the computer?	86	14	10	6	34	13

Table 6. What learners perceive as the worst things about computers

	Viruses	Computer malfunc-tion	Typing	Difficult	Computer Age	Time	Education	Nothing	Teacher	Other
What is the worst thing about computers? Why?	8	25	17	7	18	6	13	13	4	16

Table 7. Perceived impact on schoolwork

	Saves time	Makes work easier	Makes work more enjoyable	Improves results/ performance	Makes work less enjoyable	Takes more time	Other	No effect
What effect does the computer have on your schoolwork?	89	96	88	74	2	7	6	3

Table 8. Learners' perceptions of using the computer to complete different activities in Grade 7

	IMPORTANT	INTERESTING	EASY	EXCITING	MEANS A LOT	NEEDED
To me using the computer to complete different activities in Grade 7 is:	108	106	95	97	102	106

Missing data:
Qu. 23a = 2; Qu. 23b = 3; Qu. 23c = 3; Qu. 23d = 4; Qu. 23e = 4; Qu. 23f = 4

Spoilt data:
Qu. 23a = 2; Qu. 23b = 1; Qu. 23c = 4; Qu. 23d = 4; Qu. 23e = 5; Qu. 23f = 3

Table 9. Perceived restrictions to using a computer more at school

	Lack of interest	Lack of time	Lack of skills	Quality of software	Age of software	Limited amount of com-puters	Share com-puters with other students	Quality of computer	Age of computer	Lack of access to Internet	Lack of email	Teacher	None of these	Other	Don't know
What sort of things currently restrict you from using a computer more often at school?	14	84	17	27	24	31	23	22	20	37	12	25	7	7	6

Missing data:
Qu. 24a = 3; Qu. 24b = 3; Qu. 24c = 3; Qu. 24d =3; Qu. 24e = 3; Qu. 24f = 3; Qu. 24g = 3; Qu. 24h = 3; Qu. 24i = 3; Qu. 24j = 3; Qu. 24k= 3; Qu. 24l = 3; Qu. 24m = 3; Qu. 24n = 3; Qu. 24o = 3

Table 10. Learners' perceptions of why they use computers in Grade 7

	High School	Future	Schoolwork	Learning	Skills	Efficiency	Other
Why do you think you use computers in Grade 7?	14	51	29	26	18	18	8

Missing data:
Qu. 25a = 2; Qu. 25b = 2; Qu. 25c = 2; Qu. 25d = 2; Qu. 25e = 2; Qu. 25f = 2; Qu. 25g = 2

APPENDIX D, 2 – Learner Questionnaire Tables with Percentages

SECTION 1 & SECTION 2

Table 1. Learners perceived computer enjoyment and computer importance

COMPUTER ENJOYMENT	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1. Using computers in lessons makes schoolwork more enjoyable.		3 %	11 %	31 %	55 %
2. I concentrate on a computer when I use one.	2 %	8 %	16 %	49 %	24 %
3. Using a computer is difficult.	45 %	30 %	8 %	6 %	7 %
4. The use of the computer makes me feel more involved in the lessons.	2 %	8 %	23 %	34 %	29 %
COMPUTER IMPORTANCE					
5. I believe that it is very important for me to learn how to use a computer.	1 %	3 %	6 %	23 %	68 %
6. I know that computers give me opportunities to learn new things.	2 %		3 %	29 %	66 %
7. Computer skills will be essential to my working life.	1 %	3 %	10 %	28 %	58 %
8. Using a computer allows me to be more creative and do things I have not been able to do in the past.		6%	13 %	35 %	45 %
9. Computers have helped me produce work that I am really proud of.	3 %	3 %	17 %	35 %	43 %
10. I learn more quickly on a computer.	5 %	10 %	23 %	28 %	34 %
11. Using a computer allows me to work at my own pace.	3 %	12 %	13 %	29 %	43 %

SECTION 3

Table 1. Learners' perceptions of the classroom environment

CLASSROOM ENVIRONMENT	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
12. I'm encouraged to solve any problems that come up when I'm using the computer	3 %	13 %	20 %	33 %	31 %
13. I am usually confused about what to do during computer time.	42 %	32 %	9 %	9 %	5 %
14. I am not happy with what is done when we use computers.	45 %	29 %	18 %	7 %	2 %
15. My teacher is always able to help me on the computer.	3 %	10 %	5 %	30 %	52 %

SECTION 4

USABILITY

Table 1. Learners claimed frequency of using computers in school

Question	1 hr/less than 1 hr	Between 2 & 4 hrs	More than 4 hrs
How much time do you spend on the computer at school during lessons, per week?	65 %	30 %	3 %

Table 2. With whom learners report using a computer with at school

Question	Friends in class	Other children	Teachers	On your own	Other grown-ups
Who do you usually use a computer with when you're at school?	54 %	18 %	29 %	54 %	3 %

Table 3. Reported Activities undertaken on the computer at school by learners

Question	Playing games	Draw pictures	Typing	Send / receive emails	Use the Internet	Use educa-tional CD-ROMS	Watch films/DVD's	School Projects	Don't Know	Other
What type of things do you do on the computer at school?	85 %	30 %	84 %	57 %	83 %	30 %	5 %	88 %		9 %

Table 4. Reported best activities undertaken on the computer at school by learners

Question	Playing games	Draw pictures	Typing	Send / receive emails	Use the Internet	Use educational CD-ROMS	Watch films/DVD's	School Projects	Don't Know	Other
What do you like doing best on the computer at school?	88 %	22 %	29 %	52 %	65 %	8 %	13 %	28 %	2 %	6 %

Table 5. Why learners like undertaking the reported best activities on the computer

Question	Entertaining	Not difficult	Efficient	Relaxing	Education	Other
Why do you like doing these things on the computer?	72 %	12 %	8 %	5 %	28 %	11 %

Table 6. What learners perceive as the worst things about computers

Question	Viruses	Compu-ter malfun-ction	Typing	Difficult	Compu-ter Age	Time	Educa-tion	Nothing	Teacher	Other
What is the worst thing about computers? Why?	7 %	21 %	14 %	6 %	15 %	5 %	11 %	11 %	3 %	13 %

Table 7. Perceived impact on schoolwork

Question	Saves time	Makes work easier	Makes work more enjoyable	Improves results/ performa nce	Makes work less enjoyable	Takes more time	Other	No effect
What effect does the computer have on your schoolwork?	74 %	80 %	73 %	62 %	2 %	6 %	5 %	3 %

Table 8. Learners' perceptions of using the computer to complete different activities in Grade 7

Question	Important	Interesting	Easy	Exciting	Means a lot	Needed
To me using the computer to complete different activities in Grade 7 is:	90 %	88 %	79 %	81 %	85 %	88 %

Table 9. Perceived restrictions to using a computer more at school

Question	Lack of interest	Lack of time	Lack of skills	Quality of software	Age of software	Limited amount of computers	Share computers with other students	Quality of computer	Age of computer	Lack of access to Internet	Lack of staff	Teacher	None of these	Other	Don't know
What sort of things currently restrict you from using a computer more often at school?	12 %	70 %	14 %	23 %	20 %	26 %	19 %	18 %	17 %	31 %	10 %	21 %	6 %	6 %	5 %

Table 10. Learners' perceptions of why they use computers in Grade 7

Question	High School	Future	Schoolwork	Learning	Skills	Efficiency	Other
Why do you think you use computers in Grade 7?	12 %	43 %	24 %	2 %	15 %	15 %	7 %

APPENDIX E – Final Version of Teacher Questionnaire

Name: _____ **Date:** _____

Questionnaire on Teachers' perceptions on how and why computers are used in the Grade 7 classroom

To the Educator:

This questionnaire is composed of questions pertaining to your views on computers, with a particular focus on the Grade 7 classroom. Your time would be greatly appreciated in completing all items herein. Your answers will remain confidential.

Thank you for your cooperation!

Susan Friederichs

Background Information

1. How long have you been teaching?

   _____ 0-1 years _____ 2-5 years _____ 6-10 years

   _____ 11-15 years _____ 15+ years

2. How would you rate your experience with computers? (Check all that apply)

   _____ I have never used a computer and I don't plan to anytime soon.

   _____ I have never used a computer but I would like to learn.

   _____ I use applications like word processing, spreadsheets, etc.

   _____ I use computers for instruction in the classroom.
   How often?

   _____ Daily

   _____ Weekly

   _____ Occasionally

3. If you do use computers, what type of training have you received? (Check all that apply).

   _____ No training

   _____ Basic Computer Literacy (on/off operations, how to run programs)

   _____ Computer applications (word processing, spreadsheets)

   _____ Computer integration (how to use in classroom curriculum)

4. Where did you receive your training? (Rank order all that apply).

   _____ Self-taught

   _____ School district

   _____ College or university

   _____ Other- please specify _____

5. Number of years since your first computer training: _____

6. Gender: ___ M ___ F

7. Age: ___ 18-25 ___ 26-30 ___ 31-35 ___ 36-40 ___ 41-45 ___ 46+

8. Home Language: _____

9. Do you have a computer at home? ____Yes ____No

10. How often do you use the computer at home? (If 'Yes' to qu. 9, tick the appropriate option)

- ☐ Almost every day
- ☐ About once a week
- ☐ Less often than that
- ☐ Never

Section 1 - Level Of Comfort/Confidence and Experience With Computers

Instructions: Select & tick one level of agreement for each statement to indicate how you feel.

SD =Strongly Disagree, **D** =Disagree, **U** =Undecided, **A** =Agree, **SA** =Strongly Agree

		SD	D	U	A	SA
1.	I am comfortable using computers during classroom instruction					
2.	My use of computer technology enhances learner performance					
3.	Incorporating computers into lessons enhances teaching					
4.	I use computers effectively in my classroom					
5.	I am developing expertise in the use of computers in the classroom					
6.	I am comfortable giving computer-related tasks to my learners					
7.	I am comfortable with computer terminology					
8.	I have had adequate training in using computers					

Section 2 - General Attitudes toward computer use

Instructions: Select & tick one level of agreement for each statement to indicate how you feel.

SD =Strongly Disagree, **D** =Disagree, **U** =Undecided, **A** =Agree, **SA** =Strongly Agree

		SD	D	U	A	SA
1.	I feel tense when people start talking about computers					
2.	I avoid the computer whenever possible					
3.	I feel pressure from others to integrate the computer more into my classroom					
4.	Computers are dehumanizing					
5.	The use of computers should be confined to computer courses					
6.	Learning computers make high demands on my professional time					
7.	Computers diminish my role as a teacher					

		SD	D	U	A	SA
8.	Computers further the gap between learners along socio-economic lines					
9.	I can help others solve computer problems					
10.	Computer skills are essential to my learners					
11.	I would like every learner in my classes to have access to a computer					
12.	Computers should be incorporated into the classroom curriculum					
13.	I would like my learners to be able to use the computer more					
14.	Computers enhance classroom instruction					
15.	Computer skills will help me as a professional					
16.	More training would increase my use of the computer in the classroom					
17.	Computers make my job easier					
18.	Computers change my role as a teacher					

Section 3 - The Integration of computers into the classroom

Instructions: Select & tick one level of agreement for each statement to indicate how you feel.

SD =Strongly Disagree, **D** =Disagree, **U** =Undecided, **A** =Agree, **SA** =Strongly Agree

I integrate computers into the classroom ...

		SD	D	U	A	SA
1.	To promote student centered learning					
2.	Independent learning					
3.	Individual instruction					
4.	To tutor					
5.	Small group instruction					
6.	Cooperative groups					
7.	As a problem solving/decision making tool					
8.	As a research tool for students					
9.	As a classroom presentation tool					
10.	As a productivity tool					
11.	As a reward					
12.	As a communication tool					

Section 4 - Usability

1. Learners engage in computer-based activities for curricular purposes:

□ One hour/less than one hour per week □ Between 2 and 4 hours per week □ More than 4 hours per week

2. Tick the learning areas in which computers are used in teaching and learning.

□ Language
□ Mathematics
□ Natural Sciences
□ Technology
□ Social Sciences
□ Economics and Management Sciences
□ Arts and Culture
□ Life Orientation
□ Other. Specify _____

3. Indicate in order of priority two learning areas where learners make the most use of computers.

Choice 1:_____

Choice 2:_____

4. Tick the purposes for which computers are used in Grade 7:

	Drill and practice
	Presentation of assignments
	Researching Projects
	Games and simulation
	Problem solving
	Data bases
	Word processing
	Internet
	Email
	Other (specify) _____

5. Indicate in order of priority the two most important purposes for which computers are used.
(Indicate the choices from the list above.)

Choice 1:_____

Choice 2:_____

6. **Rank (from 1-9) what you feel are the best uses of computers in the classroom.**
(1 being the best use, followed by 2, and so on)

	Drill and practice
	Presentation of assignments
	Researching Projects
	Games and simulation
	Problem solving
	Data bases
	Word processing
	Internet
	Email
	Other (specify) _____

7. **Could you comment on your factors numbered 1 and 2?**

_____

_____

_____

8. **Tick the item below that you believe should be prioritised regarding computer utilisation at your school.**

Use of computers as a teaching and learning tool in all learning areas.

To teach computer skills

To expose learners to the potential benefits of computers in everyday life

Other (specify) _____

9. **The level of engagement with computer-based tasks for Grade 7 learners is ...**

Very difficult Difficult Just right Easy Very easy

Could you explain why?

_____

_____

_____

10. **Tick the one item that best describes the way in which learners in Grade 7 use computers.**

For individual work For group/collaborative work For both Other (specify) _____

11. Tick which of the following computer skills are taught to the Grade 7 learners at your school.

- ☐ Basic principles of computers
- ☐ Spreadsheets
- ☐ File management
- ☐ Desktop publishing
- ☐ Programming skills
- ☐ Ethics (acceptable use, plagiarism, hacking)
- ☐ Information skills (research on CD-ROMS, Internet)
- ☐ Word processing
- ☐ Presentation graphics
- ☐ Database
- ☐ Web-design
- ☐ Systems analysis and design
- ☐ Using the Internet (email, world-wide web)
- ☐ Other (specify) _____

12. For Grade 7 indicate, in order of priority, what you feel the three most important skills are (from the list in qu. 11.).

Choice 1:_____

Choice 2:_____

Choice 3:_____

13. Rank (from 1-6) what you feel the difficulties are with using computers in the classroom. (1 indicating the top difficulty, followed by 2, and so on).

	Not enough computers available in classrooms
	Insufficient funds available for purchase of equipment
	Little known about how children learn when using computers
	Teachers have to give up important preparation time to become familiar with computers
	Not enough teachers with both teacher and specialised training - key resource people
	Lack of suitable in-service courses for teachers

Section 5 – Importance of computers

Instructions: Select & tick one level of agreement for each statement to indicate how you feel.

SD =Strongly Disagree, **D** =Disagree, **U** =Undecided, **A** =Agree, **SA** =Strongly Agree

		SD	D	U	A	SA
1.	Computers are valuable tools that can be used to improve the quality of education.					
2.	The use of computers helps provide a better learning experience					
3.	It is important for learners to learn about computers in order to be informed citizens					
4.	The use of the computer increases motivation in the learners toward learning.					
5.	Computers stimulate creativity in learners					
6.	Computers help learners to work with one another					

7. **Rank (from 1-10) what you perceive as the most important objectives for computer use with Grade 7 learners?** (1 indicating the most important objective, followed by 2, and so on).

	Get information or ideas
	Express self in writing
	Mastering skills
	Computer skills
	Analyse information
	Remediation
	Learn to collaborate
	Learn to work independently
	Present Information to an audience
	Communicate electronically

Section 6 – Computers For Learners

Instructions: Place an 'x' between each adjective pair to indicate how you feel about the object.

E.g. good ___ X ___ ___ ___ ___ ___ bad

(Placing the 'x' nearer to 'good' would indicate that you feel computer use is closer to good than bad)

For **my learners using computers in the classroom** is:

1.	important	___ ___ ___ ___ ___ ___ ___	unimportant
2.	boring	___ ___ ___ ___ ___ ___ ___	interesting
3.	relevant	___ ___ ___ ___ ___ ___ ___	irrelevant
4.	exciting	___ ___ ___ ___ ___ ___ ___	unexciting
5.	means nothing	___ ___ ___ ___ ___ ___ ___	means a lot
6.	appealing	___ ___ ___ ___ ___ ___ ___	unappealing
7.	fascinating	___ ___ ___ ___ ___ ___ ___	mundane
8.	worthless	___ ___ ___ ___ ___ ___ ___	valuable
9.	involving	___ ___ ___ ___ ___ ___ ___	uninvolving
10.	not needed	___ ___ ___ ___ ___ ___ ___	needed

Section 7 – Individual responses

1. **Do you perceive any benefits for learners in using computers? If so, what might they be and why?**

2. **Do you perceive any disadvantages for your learners in using computers? If so, what might they be and why?**

3. **How would you like Information Technology in your classroom/school to develop? (Or, alternatively, to be reduced.)**

Thank you for your time

APPENDIX F – Final Version of Learner Questionnaire

Learners' perceptions on how and why computers are used in the Grade 7 classroom

Learner Questionnaire

Please provide details in the box below:

Name: _____ **Date:** _____

Age: _____ **Home Language:** _____

School: _____ **Gender (please tick):** ___ Male
___ Female

Do you use a computer at home? Yes____ No____

How often do you use the computer at home? (Tick the appropriate option)

- ☐ Almost every day
- ☐ About once a week
- ☐ Less often than that
- ☐ Never
- ☐ Don't know

DIRECTIONS

1. This questionnaire asks you to give your opinion. There are no right or wrong answers. This is not a test.
2. Read the instructions carefully.
3. Please try and give an answer for every question.

Instructions: Read each statement and then circle the number which best shows how you feel.

SD =Strongly Disagree, **D** =Disagree, **U** =Undecided, **A** =Agree, **SA** =Strongly Agree

		SD	D	U	A	SA
Section 1 - Computer Enjoyment						
1.	Using computers in lessons makes schoolwork more enjoyable.	1	2	3	4	5
2.	I concentrate on a computer when I use one.	1	2	3	4	5
3.	Using a computer is difficult.	1	2	3	4	5
4.	The use of the computer makes me feel more involved in the lessons.	1	2	3	4	5
Section 2 - Computer Importance						
5.	I believe that it is very important for me to learn how to use a computer.	1	2	3	4	5
6.	I know that computers give me opportunities to learn new things.	1	2	3	4	5
7.	Computer skills will be essential to my working life.	1	2	3	4	5
8.	Using a computer allows me to be more creative and do things I have not been able to do in the past.	1	2	3	4	5
9.	Computers have helped me produce work that I am really proud of.	1	2	3	4	5
10.	I learn more quickly on a computer.	1	2	3	4	5
11.	Using a computer allows me to work at my own pace.	1	2	3	4	5
Section 3 – Classroom Environment						
12.	I'm encouraged to solve any problems that come up when I'm using the computer	1	2	3	4	5
13.	I am usually confused about what to do during computer time.	1	2	3	4	5
14.	I am not happy with what is done when we use computers.	1	2	3	4	5
15.	My teacher is always able to help me on the computer.	1	2	3	4	5

Section 4 - Usability

Instructions: Tick the best option for you. For example: ☑

16. How much time do you spend on the computer at school during lessons, per week?
(Think how may periods you spend using the computer!)

☐ One hour/less than one hour ☐ Between 2 and 4 hours ☐ More than 4 hours

17. Who do you usually use a computer with when you're at school?

☐ friends in class ☐ other children ☐ teachers ☐ on your own ☐ other grown-ups

18. What type of things do you do on the computer at school?
(Tick the appropriate options)

☐ Play games ☐ Draw pictures ☐ Typing
☐ Send/receive emails ☐ Use the Internet ☐ Use educational CD-ROM's
☐ Watch films/DVD's ☐ School projects ☐ Don't know
☐ Other (specify) _____

19. What do you like doing best on the computer at school?
(Tick the appropriate options)

☐ Playing games ☐ Drawing pictures ☐ Typing
☐ Sending/receiving emails ☐ Using the Internet ☐ Using educational CD-ROMs
☐ Watching films/DVD's ☐ School projects ☐ Don't know
☐ Other (specify) _____

20. Why do you like doing these things on the computer?

_____

_____

_____

21. What is the worst thing about computers? Why?

_____

_____

_____

22. What effect does the computer have on your schoolwork?
(Tick as many options as you want)

Saves time	Makes work easier	Makes work more enjoyable
Improves results/performance	Makes work less enjoyable	Takes more time
Other (specify) _____	No effect	

23. Tick one of each pair.
To me using the computer to complete different activities in Grade 7 is:

unimportant	or	important
boring	or	interesting
difficult	or	easy
dull	or	exciting
means nothing	or	means a lot
not needed	or	needed

24. What sort of things currently restrict you from using a computer more often at school?
(Tick as many options as you want)

Lack of interest	Lack of time
Lack of skills	Quality of software
Age of software	Limited amount of computers
Share computers with other students	Quality of computer
Age of computer	Lack of access to Internet
Lack of email	Teacher
None of these	Other (specify) _____
Don't know	

25. Why do you think you use computers in Grade 7?

_____

_____

_____

_____

Thank you!

APPENDIX G – Interview Schedule

INTERVIEW SCHEDULE – Teachers' perceptions of how and why computers are used in the Grade 7 classroom

1. What kinds of learning activities are the learners involved in, in using computers in Grade 7?

2. What do you think about the use of the computer in your classroom context?

3. Do you believe that computers can bring added value to the classroom? If so, what added value would you be referring to?

4. In your opinion, how do you feel the use of the computer assists in the learning development of the children?

5. Is there a curriculum or any policy within the school with regard to the use of computers (Grade7 in particular)?

   - If so where do you get it?
   - What do you think of it?
   - How do you use it?
   - If not how do you decide what to do?

6. To what extent are you able to integrate the computer into the different learning areas of the curriculum? How is this done?

7. Having said that, does the use of computer technology serve to supplement, enhance or transform the current curriculum?

8. Could you describe your role in the classroom when teaching with computer technology? Change? Is that a change for you?

9. What would you say about control over what is learned and how it is learned?

10. Do you see any improvements academically or socially in your learners through their use of computers? If so, what might they be?

11. Could you give me an indication of the school fees per child for a term/year?

12. Have you anything else you would like to add or ask me?

APPENDIX H, 1 – Teacher 1 Interview Transcript

TRANSCRIPT OF INTERVIEW - School A (04/06/2003)
- Computer Specialist Teacher, Teacher 1

1. What kinds of learning activities are the learners involved in, in using computers in Grade 7?

They've done so far this year, desktop publishing, Cami Maths, print artist, then they did an energy audit, that was in Word they had to set up a table, they had to go and get their findings, data collection, and then put their data into the table. Then they did a spreadsheet and they had to work out a budget that was using Microsoft Excel, so they had to set out their budget and then had to put in their formulas, to get their totals. It was quite a nice exercise and they enjoyed that. I would say their budget was the first time they used a spreadsheet to work out a budget, they touched on formulae's before in Grade 5, I introduced them to what a spreadsheet is really about and how to use formulas.

How do you link tasks and learning areas?

Well their budget formed part of EMS, so I actually gave their finished spreadsheets to their EMS teacher and he actually linked them. Their desktop publishing, they were doing Shakespeare in English so they had to do covers for their Shakespeare projects, and for various subjects they do covers. So I liaise with the relevant teachers. And their energy project was to do with Science and there too I liaised with the Science teacher. I liaise weekly with the teachers.

2. What do you think about the use of the computer in your classroom context?

I think it's very important. I think to actually teach them to use a keyboard rather than to write out everything is very important because the presentation in the end is much better, the spell check is a wonderful tool. And where graphics are concerned as well, it's great.

3. Do you believe that computers can bring added value to the classroom? If so, what added value would you be referring to?

The computer definitely adds value. You know with like the spreadsheets as well, just using formulas I mean it would actually make sense to them, when they learning formulas in Maths – why do we need to learn theses formulas? And they can actually see how they work out, on the computer.

4. In your opinion, how do you feel the use of the computer assists in the learning development of the children?

Definitely. Well obviously just to handle that technology, is a great thing. Socially it has an impact, certainly they enjoy the computer lessons, it's a freer lesson. They are in charge of their own learning and I find that they help each other quite a bit as well. A couple of games on the computer as well, like Jack Rabbit; four of them can play the same time networked from their computers. I mean things like that creates create enthusiasm.

5. Is there a curriculum or any policy within the school with regard to the use of computers (Grade7 in particular)?

- If so where do you get it?
- What do you think of it?
- How do you use it?
- If not how do you decide what to do?

No there isn't actually, and I wish there because we could get a lot done and know exactly what should be covered, but the education department doesn't seem to be that involved. So I've developed something myself. I try to give them opportunities to use all the programs in Microsoft Office as much as possible. They will touch on a bit of PowerPoint later. I try to start it in Grade four and develop it. So I have an idea of what I would like to cover computer skill wise and then link it up with the learning areas.

6. To what extent are you able to integrate the computer into the different learning areas of the curriculum? How is this done?

Answered in above questions!

7. Having said that, does the use of computer technology serve to supplement, enhance or transform the current curriculum?

Definitely. Another thing I've got in the pipeline is for someone to put up a server for me, which would be wonderful for the learners then all to access the Internet at the same time, from their computers. – so that they can use it for research and that is really important.

8. Could you describe your role in the classroom when teaching with computer technology? Change? Is that a change for you?

They get their queue from me, before they actually do anything on the computer then you see how they work it out and help them wherever is necessary. So the change comes in because you are facilitating the learning more, in place of instructing the entire lesson.

9. What would you say about control over what is learned and how it is learned?

I would say I have complete control over that, obviously you don't have control of the learners minds, so a pupils who's switched off there's really not much you can do about that. But on the whole, I feel that the learners a bit more in control of their learning, because it's not like they're just copying down notes or things like that. They actually have to put into action what they've learnt, and they've got to do it instantly.

10. Do you see any improvements academically or socially in your learners through their use of computers? If so, what might they be?

Yes I would say particularly learners who've come from other schools, who probably haven't had computers. I mean here they've had computers from Grade 1. I mean I can't think of one particular Grade 7 chap, who really we actually didn't have a good relationship because all he wanted to do was play games. I think he was actually threatened by the computer at first and he knew his outcome would not be on the same level as the other pupils, but I found a whole change. I've seen his confidence growing, he's more in control now as he's learnt more skill and he's actually producing very good work compared to what he did 6 months ago.

11. On the whole how do you think that your learners in Grade 7 respond computers?

They love it, because I know that they are actually very disappointed when they miss the lesson. I don't know if it's because they see it as a social lesson, or because they are so excited about what they learn. For instance the other day when they were doing their budgets they really enjoyed that because they had to be creative as well. They were give R250 and they had to clothe, feed themselves, think of transport, and any sort of luxury things they might need. Some of the comments that came through were surprises like there's no money for luxuries. And that was a really quality exercise.

APPENDIX H, 2 – Teacher 2 Interview Transcript

TRANSCRIPT OF INTERVIEW - School B (27/05/2003)
- Gr 7 Computer Teacher & Gr. 7 Class Teacher, Teacher 2

1. What kinds of learning activities are the learners involved in, in using computers in Grade 7?

   I can only tell you what I've done (not been at school until Term 2). We did some graphs we did some spreadsheets, we are using Word. Downloading articles from the Internet and putting things in a magazine style using Word.

2. What do you think about the use of the computer in your classroom context?

   I just think that you can't do anything without computers anymore. I just don't think anyone can get by without a computer, so one has to now use the machine to get by. You have to know the skill to do as much as you can.

3. Do you believe that computers can bring added value to the classroom? If so, what added value would you be referring to? (not asked)

4. In your opinion, how do you feel the use of the computer assists in the learning development of the children?

   I don't know that because I know that like even when I try to use the Internet sometimes, you sometimes search for a long time and then like if I'm on it at home, I can spend 20mins or so trying to find something I still haven't found, so if you know where the sites are then you can go straight there, then that's easier and you can download stuff and use it. But the navigating is sometimes a problem.

5. Is there a curriculum or any policy within the school with regard to the use of computers (Grade7 in particular)?

   - If so where do you get it?
   - What do you think of it?
   - How do you use it?
   - If not how do you decide what to do?

   I don't think so, as far as far as I know everyone seems to provide their own plan. The teacher in charge of IT in the school gave me something the other day, so she has hopefully developed something, I mean I've come in halfway through so I don't know. It would seem like the schools developed their own policy, although I mean at the other private school I was at they had Computers 4 Kids and that was very well organized.

So how do you decide what to do with the learners?

Often speaking to a friend at another school and saying what are you doing, what can I do? Sharing ideas!

6. To what extent are you able to integrate the computer into the different learning areas of the curriculum? How is this done?

I'm trying to do something now with Afrikaans. The problem is using the room, because it only accommodates 15, so you have to find someone to sit with the other half of the class when you take the one half. So that's a problem. So we are trying to make that link. We are doing like posters and things for Afrikaans projects I want them to do. As a Grade 7 teacher I know more or less where they are at and go from there.

7. Having said that, does the use of computer technology serve to supplement, enhance or transform the current curriculum?

Supplement.

8. Could you describe your role in the classroom when teaching with computer technology? Change? Is that a change for you?

In the computer class I'm often learning from the kids, they know much more than I do– most of them, well a lot of them. They'll do something and if I'm stuck I'll ask the children because I do that at home. My son knows much more than me and he'll show me and I'll go slow down. And with the Grade 7's for instance, in the classroom, when we are doing something and then I'll say okay who knows how to do this and then they show me. So it's very much a reciprocal process of the students teaching me sometimes and me teaching them.

9. What would you say about control over what is learned and how it is learned?

You have to do it to learn it. There's no other way of doing it. So you forget if you don't use a skill for a while, I mean I find that as well– I've might have done spreadsheets but if I don't use it regularly, I'm going to forget how to do it and then once you're shown again you can use it. But you can't just tell someone how to use it, but they've got to use it. So the learners have control over how and what they are doing.

10. Do you see any improvements academically or socially in your learners through their use of computers? If so, what might they be?

No, in fact it's probably the only thing, that it becomes negative because you get so involved and can be so isolated. I mean I see the kids playing games and stuff, they just become totally on their own and they can shut out everything else and they become more

and more – those hard children – you can just lose them totally and you don't even know that they are there. So here it's probably as a negative thing.

How do you feel your learners are responding to computers in Grade 7?

I think they're fine. I think that those who battle to type and have those skills not developed, they hate it. Because they can't keep up. But it's the other ones, they – I've always done this when I teach computers - that once they've done the task and you've got the hang you can do whatever you like on the computer after that and they like that – then they can go and look for games and play games or go on the Internet or get mail or send mail and then they like that. So often it's something other than the actual work, but those kids have usually got the skills anyway so they don't mind the work.

Do the learners get to use computer outside of the set academic timetable?

I haven't yet used it, but there is a timetable and I'm sure, but again the problem is the numbers, there's only 15 computers and unless someone looks after the rest of your class. So it's tricky.

APPENDIX H, 3 – Teacher 3 Interview Transcript

TRANSCRIPT OF INTERVIEW - School C (28/05/2003)
- Computer Specialist Teacher, Teacher 3

1. What kinds of learning activities are the learners involved in, in using computers in Grade 7?

So far this year, they have done a lot of research work. Right at the beginning of the year we did quite a lot about research – evaluating web sites and things about bibliographies because it comes up a lot in their projects and they get it wrong every time, so bibliographies, and also about search engines, because once we'd done bibliographies I found that in their bibliographies they all writing google or yahoo. So a lot of focus on research to begin with because they do a lot of project work in Grade 7 and a lot they are expected to do on their own, so they've go to have the skills. They've also been doing the web quest which they appear excited about, but I break it up in-between with other activities so they don't get bored with it

2. What do you think about the use of the computer in your classroom context?

Okay if you give them free time or if they come in here on their own they mostly play games. That's normal, they love it and the more violent the games are the better, so you've got to be quite careful about what you allow them to bring in here and everything has to go either through me or through their own class teacher before they can put it on.

There are some children who still prefer to handwrite things, because their keyboarding skills are not up to scratch, and then the task is laborious. But generally you will find most of them prefer to do their projects using the computer. The work that they produce is neater and they have more pride in it. And they like things in that are in color as well, so they do a lot of color printing. So I would say they are very positive, I never have to nag anybody to come in here.

3. Do you believe that computers can bring added value to the classroom? If so, what added value would you be referring to?

It does add value to learning in the different learning areas in some instances, and it also depends how the teacher uses it.

They don't use them very much in their classrooms at the moment. If there's a project on the go obviously they will use them for research or for typing, that kind of thing. I know the one Maths teacher uses her quite often, for the kids who've finished their work and she's got some websites and games for them to do.

4. In your opinion, how do you feel the use of the computer assists in the learning development of the children?

Yes, but it depends on what you do. Their language skills definitely, I mean I've picked up a lot of things where I've been to their Language teacher and said look they really can't write letters or they don't know where to use commas, etc. So it helps you to identify areas where maybe there are weaknesses, you pick up the weaknesses and then obviously you've got to find the right program or right exercise to include those things.

5. Is there a curriculum or any policy within the school with regard to the use of computers (Grade7 in particular)?

- If so where do you get it?
- What do you think of it?
- How do you use it?
- If not how do you decide what to do?

We've got something which we've drawn up ourselves, and I didn't actually have that much to do with it. It was drawn up by the teacher before me, but we've kind of adapted it and added on as we go along. And we concentrate mostly on skills, and then incorporate it into the different learning areas. So I'll find out what the teachers are doing in their classes and then decide on something that can compliment that or add to what they've done.

6. To what extent are you able to integrate the computer into the different learning areas of the curriculum? How is this done?

They use computers quite a bit for EMS, we did spreadsheets and that kind of thing. They've used it for obviously for the Natural Sciences not only for research, but we've had a look at, or a little bit later on in the year it comes up where they do dissections and instead of actually dissecting the things, there are things on the Internet that they can have a look at. And for general Maths and Language.

7. Having said that, does the use of computer technology serve to supplement, enhance or transform the current curriculum?

I don't think it's transforming the curriculum. Teachers are still quite weary of it and because the curriculum is still developing and the teachers are not quite sure what's expected of them there.

8. Could you describe your role in the classroom when teaching with computer technology? Change? Is that a change for you?

Definitely more a facilitator, because the learners are enthusiastic about what they are doing, and they are actively involved in their learning.

9. What would you say about control over what is learned and how it is learned?

Learners in the computer lab are also very much in charge of their own learning.

10. Do you see any improvements academically or socially in your learners through their use of computers? If so, what might they be?

It depends on the child, but at our school there is a lot of group and co-operative working in partners and things like that and in the computer lab a lot of that happens as well – if they can't do something instead of waiting for me to get there they'll ask somebody next door. I know when it comes to games and games that they like, I'll often say I have no idea how that works, and yes soon enough they'll find out from others and they share information.

11. How do feel your Grade 7's are approaching Computers?

They've been involved in using computers for a long time. I mean ever since I came to this school we had a few computers. This lab for instance has been up for about 8 years, so they've had input right from the beginning of their school years, so they are quite advanced by the time they get to Grade 7. They also are very enthusiastic about using the computer, which is wonderful.

APPENDIX H, 4 – Teacher 4 Interview Transcript

TRANSCRIPT OF INTERVIEW - School D (29/05/2003)
- Computer Specialist Teacher, Teacher 4

1. What kinds of learning activities are the learners involved in, in using computers in Grade 7?

   When we teach computers we focus on skills. So I would take like the PowerPoint presentation that they have done, I would take what they are doing in class (like dance) and then teach them the skills in that program. So a variety of skills that are important. So we are linking it up with the learning areas, so that they are working with something that they know. Like for example the lets take what I did with my Grade 3's, they are busy with my body. So I did word processing skills, but using something that they know. In Grade 7 we try to concentrate on all aspects of IT, e.g. presentation skills, working with the spreadsheets. So I'm trying to equip them for high school in what they might do.

2. What do you think about the use of the computer in your classroom context?

   As it is in the school, I find that they use it adequately, they don't spend all their time on the computer – it is used as a reward in the class. And the way I use it here I find, I wish all schools had it, because its amazing what the computer does for the child – confidence, language – they are forced to read, because when I give them reading assignments they say "but Miss I have to read". But here they are forced to read. So no I'm all for it.

3. Do you believe that computers can bring added value to the classroom? If so, what added value would you be referring to?

   Yes, definitely.

4. In your opinion, how do you feel the use of the computer assists in the learning development of the children?

   Definitely. I've mentioned in Language, but even in confidence building because I have quite a few students who are very introverted and they excel on the computer. And they also become more confident in their relationship with me. You know at the beginning of the year the Grade 7's timid, scared to put up their hand, but about half way through the year, "Miss I need this etc". It could be other factors in their lives, but I'm hoping it's using the computer.

5. Is there a curriculum or any policy within the school with regard to the use of computers (Grade7 in particular)?

- If so where do you get it?
- What do you think of it?
- How do you use it?
- If not how do you decide what to do?

The curriculum we have is an outcomes-based curriculum (from Computers 4 Kids). So we work according to that and it's totally integrated – integrated into most of the learning areas.

At the beginning of each term at this school the class teachers have to plan their next term work, so once that planning is done I ask for a copy of their term planner and then I base my lessons on what they are doing. I think this is an effective way because it is helping the learners academically. I also find if you are linking up with what they are doing in the classroom, you get more out of them when using the computer because they got the background knowledge. I find it does work.

6. To what extent are you able to integrate the computer into the different learning areas of the curriculum? How is this done?

(Look above answer as well)

The main learning areas I tend to focus on: I must admit I was an English teacher, so I tend to concentrate on the Languages aspects a lot – spelling, writing, grammar. Again the computer does justice - the spell check the grammar check. So I do tend to do too much of that but I do try when I plan my lessons to incorporate the other learning areas as well.

7. Having said that, does the use of computer technology serve to supplement, enhance or transform the current curriculum?

Definitely enhance the curriculum.

8. Could you describe your role in the classroom when teaching with computer technology? Change? Is that a change for you?

It took me about a month to adapt to the style of teaching here, where you are no longer just standing up in front of the class and teaching, you are moving around the classroom assisting and motivating.

9. What would you say about control over what is learned and how it is learned?

I don't think there is more control in the hands of the learners here. Because in the ordinary classroom, if a child doesn't want to learn how are you as the teacher going to get that child to learn? Same thing here I do have 1 or 2, even Grade 7's, that absolutely refuse to do their work, even with the computer. In this situation though once the direct teaching is done, the learning at the computer is in their own hands, with one on one assistance from me.

10. Do you see any improvements academically or socially in your learners through their use of computers? If so, what might they be?

You see I don't think I can really answer that question because I only see them once a week.

11. How do you think your learners are responding to the use of computers?

They are definitely, enthusiastic and positive. You would be amazed at how excited they get when they learn something new. And sometimes we have a change in the timetable and the computer time is affected and when the teacher tells them they are quite angry because they had to miss computers. So it makes me feel good. From the Gr R's to the Gr 7's they do not want to miss computers.

APPENDIX I – Observation Schedule

Observation Schedule for Computer Based Grade 7 Learning Environment

Teacher: _____ Location: _____ Date: _____

Observer: _____

Time observation begins: _____

Time observation ends: _____

Number of learners present: _____

Time on computer task: _____

Teacher time explaining task: _____

DESCRIPTION OF THE CLASSROOM LESSON: OBSERVER COMMENTS

Description/diagram of the physical setting:

Brief Narrative description of activity:

❖ **The computer is primarily used for** – *(Indicate choice(es) by estimating the percentage of lesson time the computer was used, e.g. 10%.)*

_____ drill/practice
_____ presentation of assignments
_____ researching projects
_____ games and simulation
_____ problem solving
_____ databases
_____ word processing
_____ Internet
_____ Email
_____ Other (specify) ……..

❖ **Is the use of the computer observed staged ____ or part of curriculum _____?**
If part of the curriculum, in which learning area is the computer made use of?

Language
Mathematics
Natural Sciences
Technology
Social Sciences
Economics and Management Sciences
Arts and Culture
Life Orientation
Other. Specify _____

Activity Structure (check all that apply)

Observation/Activity	
Teacher-led	
Independent	
Small group cooperation	
Small group collaboration	
Student-led	
Pair tutor	
Pair cooperation	
Pair collaboration	
Competitive	
Rotating stations/centers (describe):	
With aide	
Learner choice	

FOCUS ON 3 LEARNERS

Usability: Technical performance:	Very well	Well	Adequately	Poorly	Skill not evident
Can the learners use the mouse? Learner 1: Learner 2: Learner 3:					
Can the learners use the keyboard? Learner 1: Learner 2: Learner 3:					
Can the learners navigate the environment? Learner 1: Learner 2: Learner 3:					
Can the learners access the environment? Learner 1: Learner 2: Learner 3:					

1. At what points do learners encounter technical/performance problems?

.....
.....
.....

2. Which parts of the environment appear to present learners with the greatest challenge?

.....
.....
.....

Comprehension	Very well	Well	Adequately	Poorly	Skill not evident
Do the learners engage with the task? Learner 1: Learner 2: Learner 3:					
Do the learners understand the structure of the task? Learner 1: Learner 2: Learner 3:					
Do the learners understand the content of the task? Learner 1: Learner 2: Learner 3:					

1. Which aspects of the task appear most difficult for learners?

.....
.....
.....

Appeal: interest and satisfaction: computer environment	**Very interested**	**Interested**	**Somewhat interested**	**Not interested**
How do learners respond to the layout of the environment? Learner 1: Learner 2: Learner 3:				
How do learners respond to the design of the environment? Learner 1: Learner 2: Learner 3:				
How do learners respond to the task? Learner 1: Learner 2: Learner 3:				
	Not distracted	**Sometimes distracted**	**Distracted**	**Often distracted**
How often are learners distracted by external events (other class members-teacher/pupil talk not related to the task, etc)? Learner 1: Learner 2: Learner 3:				

1. Which aspects of the task did learners engage with most?

.....
.....
.....

LEARNER HISTORY WITH TASK				
	Learners perform skill/task independently, with little assistance needed	Learners perform skill/task independently, with some assistance required from teacher	Teacher provides strong scaffolds as learners try to perform new skill or task	Teacher shows/demonstrates skills and activities while learners watch/listen
Learner 1: Learner 2: Learner 3:				

PROBLEM SOLVING: FOCUS ON 3 LEARNERS

How do they solve problems on the computer?	**LEARNER 1:** **LEARNER 2:** **LEARNER 3:**

Further Description of learner actions & reactions:

Learner 1:

Learner 2:

Learner 3:

FOCUS ON THE WHOLE CLASS OF LEARNERS

CLASSROOM MANAGEMENT/CLIMATE:

Observation/Activity	
Proportion on task	76 % or more 51-75 % 26-50 % 1-10 % None
Proportion collaborating with other learners around tasks (mutual aid)	76 % or more 51-75 % 26-50 % 1-10 % None
Proportion appearing interested or motivated	76 % or more 51-75 % 26-50 % 1-10 % None

TASKS

CHALLENGE			
All/nearly all learners are appropriately challenged e.g. • Most of learners, most of the time appear to be engaged in meaningful activities which challenges them to think. • Learners have some control over level of difficulty	About half the learners are appropriately challenged all of the lesson/all learners appropriately challenged for part of the lesson.	Some learners are doing appropriately challenging work for some of the time.	No/few learners are doing work which is appropriately challenging.
THINKING			
Almost all learners, almost all of the time, are engaged in *higher order thinking* e.g. • Problem-solving, exploration/inquiry, analysis, communicating effectively, designing solutions, creating presentations, critical thinking, real-world applications Vs Drill & practice, 'electronic workbook' for word-processing.	Learners are engaged in at least one major activity during the lesson, in which they perform higher order thinking, and this activity occupies a substantial portion of the lesson and many learners are engaged in this portion of the lesson.	Learners are primarily engaged in lower order thinking, but at some point they perform higher order thinking as a minor diversion within the lesson.	Learners are engaged only in *lower order thinking*; i.e., they either receive, or recite, or participate in routine practice and in no activities during the lesson do learners go beyond simple reproduction. (e.g. Drill & practice, 'electronic workbook' for word-processing)
ENGAGE INTEREST			
All/nearly all learners are engaged in doing the task for nearly all of the lesson.	Around half of the learners are engaged/most learners are engaged for around half of the time.	A few learners are engaged/most learners are engaged for a little of the time in doing the task.	Virtually no learners are engaged in doing the task.

How well do the learners respond to the technology?	**1** **Extremely Well** All/nearly all learners adept at using technology, eager to use technology as required by lesson as well as additional activities, refer positively to technology.	**2** **Moderately** All/nearly all learners comfortable with technology, willing to use technology as required by lesson, do not refer negatively to technology.	**3** **Not at all** All/nearly all learners uncomfortable with technology, ignore technology, refer disparagingly to technology.
How well did learners like using the computer?	**1** **Extremely Well** All/nearly all learners eager to use the computer for lesson and additional activities.	**2** **Moderately** All/nearly all learners willing to use the computer as prescribed by lesson.	**3** **Not at all** All/nearly all learners avoided using the computer if at all possible.

CLASSROOM ENVIRNOMENT

***LEARNING ENVIRONMENT**				
The learning environment is learner-centered. The teacher acts as collaborator, supporting learners in their exploration of unique solutions to learning problems. Learners are encouraged to use their personal knowledge, pose their own questions and find alternative ways of finding solutions.	The learning environment is primarily learner-centered. The teacher coaches and challenges learners to come up with creative solutions to problems. There is opportunity for peer tutoring and the sharing of discoveries. The teacher provides scaffolding however; direct instruction is a minor part of the lesson.	The learning environment is primarily teacher-centered however there is one significant activity built into lesson which allows learners to explore and search for unique learning solutions. The learners know what is to be learnt rather than just the task at hand.	The learning environment is primarily teacher-centered however learners are given a minor opportunity for decision making, e.g. choosing font and number of columns to work in.	The learning environment is teacher-centered. Teacher controls focus of student learning, giving all information and asking all questions. Learners are passive learners, work through step by step procedures and achieving similar end products.

* *DESCRIPTION OF LEARNING ENVIRONMENT:*

A learner-centered learning environment is present when the teacher works in the role of support and collaborator, actively coaching learners to explore, discover and create unique solutions to learning problems. Learners participate at times as the expert/knowledge provider as they are encouraged to use their personal knowledge develop and pose their own questions, gather and evaluate information for themselves, and explore their own alternative ways of finding out answers. The teacher participates at times as one who may not know it all but desires to learn.

A *teacher-centered learning environment* is present when the learners are passive learners. The teacher is the primary source of information, always asks questions and controls the focus of student learning. The teacher directs learners through pre-set step-by-step exercises so that all achieve similar results. The student is always in the role of learner, receiving all information and directions from the teacher.

TALK

TEACHER-LEARNER TALK			
Teacher-learner talk displays high level of features of discussion e.g. • Provides feedback on learners explanations • Learners take initiative to feedback to teacher seek clarification and ask questions	Teacher-learner talk displays some features of discussion e.g. • Teacher feedback to learners on reasons and explanations is praised irrespective of content. Learners only communicate their understandings to teacher when asked.	Teacher-learner talk is directed by teacher and does not feature any elements of discussion.	No teacher-learner talk beyond closed questions and answers.
LEARNER TALK			
Many learners are frequently encouraged to provide extended accounts of reasons/understandings: • Articulations: getting learners to explain wheat they know. • Reflections: let learners compare their reasoning or understandings with others. • Exploration: learners explore in order to generate their own positions.	Some learners are afforded the opportunity to provide extended accounts of reasons and understandings.	Opportunities to encourage learners to display reasoning are not used.	Learners do not express their reasons or understandings.
MANAGEMENT OF TALK			
Lesson is skilfully managed to encourage maximum participation of all learners, e.g. • Learners are encouraged to engage with each other's explanations, questioning and seeking clarification. • Teacher checks the learners are attending to each others' explanations	Lesson is managed to encourage participation of learners who are selected to talk, but not the engagement of others.	Opportunities to engage learners in talk are not used: e.g. • Learners explain reasons and understanding mainly to the teacher • Learners do not engage with each others explanations	Task is not managed effectively.

FOCUS ON THE TEACHER

How well does the teacher respond to the technology?	**1** **Extremely Well** Teacher adept using technology, use of technology in no way distracts from lesson, refers positively to technology	**2** **Moderately** Teacher comfortable with technology, incorporates technology into lesson with little difficulty, does not refer negatively to technology	**3** **Not at all** Teacher uncomfortable with technology, ignores technology, refers disparagingly about technology
How well did teacher like using the computer?	**1** **Extremely Well** Teacher eager to use the computer for the lesson as well as activities beyond the scope of the lesson	**2** **Moderately** Teacher willing to use the computer to support lesson	**3** **Not at all** Teacher avoided using the computer as much as possible

❖ **Where was the teacher's emphasis with the technology?** *(Indicate response by estimating the percentage of lesson time devoted to the specific use of technology, e.g. 15%.)*

	Get information or ideas
	Express self in writing
	Mastering skills
	Computer skills
	Analyse information
	Remediation
	Learn to collaborate
	Learn to work independently
	Present Information to an audience
	Communicate electronically

TASKS

HOW WAS THE USE OF THE COMPUTER INTRODUCED BY THE TEACHER FOR THE LESSON?					
As an integrated but essential tool	As a separate but essential tool	As a separate but not essential tool	As an integrated but not essential tool	Barely mentioned	Not mentioned at all

❖ **What was the teacher's primary emphasis of the lesson on?** *(Indicate response(s) with an estimate of the percentage of lesson time, e.g. 25%.)*

_____ the technology
_____ the content
_____ the process

RELATIONSHIPS & NORMS

COMMUNITY OF LEARNERS			
Teacher explicitly works on developing classroom as a community of learners: e.g. • Norms are explicitly communicated to pupils • Teacher provides explicit feedback to learners on expected norms	Teacher appears to have expectations of norms that might lead to a commodity of learners but does not share these explicitly with learners	Classroom norms separate teacher and learners-roles are not see as mutually dependent e.g. • I teach- you learn • You discover- I facilitate	Classroom norms based on computer-related tasks as jobs to be done rather than ideas to learn about.

TEACHER'S ROLE (check all that apply)

Observation/Activity	
Explain/clarify/provide info	
Question (known-answer)	
Question (open-ended)	
Assist or help (teacher-initiated)	
Assist or help (student-initiated)	
Manage/monitor organization of task	
Test	
Correct/grade	
Not present	

TALK

TEACHER TALK			
Teacher talk demonstrates high level of attention to developing ways of conveying meaning: e.g. • Draws on different models to provide further explanations.	Teacher talk demonstrates some attention that there can be more than a single way of conveying meaning: e.g. • Teacher provides elaborated explanations.	Teacher talk demonstrates belief that there is a single way of explaining to convey meaning.	Teacher talk demonstrates belief that teaching involves transmission: e.g. • Instructs learners in procedures • No reasons given that might help develop relational understanding.

***Description of teacher actions & reactions:**

i.e. Level of comfort & confidence
Classroom environment & instruction
Integration of computers
Usability

APPENDIX J – Preliminary Developed Teacher Tables, Comparing the Four Schools

TEACHER QUESTIONNAIRE DATA FROM FOUR SCHOOLS

Section 1 - Level Of Comfort/Confidence and Experience With Computers

1. I am comfortable using computers during classroom instruction

	SD	D	U	A	SA
TEACHER 1					1
TEACHER 2				1	
TEACHER 3					1
TEACHER 4					1

2. My use of computer technology enhances learner performance

	SD	D	U	A	SA
TEACHER 1					1
TEACHER 2			1		
TEACHER 3				1	
TEACHER 4					1

3. Incorporating computers into lessons enhances teaching

	SD	D	U	A	SA
TEACHER 1					1
TEACHER 2				1	
TEACHER 3				1	
TEACHER 4					1

4. I use computers effectively in my classroom

	SD	D	U	A	SA
TEACHER 1					1
TEACHER 2			1		
TEACHER 3				1	
TEACHER 4					1

5. I am developing expertise in the use of computers in the classroom

	SD	D	U	A	SA
TEACHER 1					1
TEACHER 2				1	
TEACHER 3				1	
TEACHER 4					

6. **I am comfortable giving computer-related tasks to my learners**

	SD	D	U	A	SA
TEACHER 1					1
TEACHER 2				1	
TEACHER 3				1	
TEACHER 4					1

7. **I am comfortable with computer terminology**

	SD	D	U	A	SA
TEACHER 1					1
TEACHER 2				1	
TEACHER 3				1	
TEACHER 4					1

8. **I have had adequate training in using computers**

	SD	D	U	A	SA
TEACHER 1				1	
TEACHER 2			1		
TEACHER 3				1	
TEACHER 4					1

Section 2 - General Attitudes toward computer use

1. **I feel tense when people start talking about computers**

	SD	D	U	A	SA
TEACHER 1		1			
TEACHER 2		1			
TEACHER 3	1				
TEACHER 4		1			

2. **I avoid the computer whenever possible**

	SD	D	U	A	SA
TEACHER 1	1				
TEACHER 2	1				
TEACHER 3	1				
TEACHER 4		1			

3. I feel pressure from others to integrate the computer more into my classroom

	SD	D	U	A	SA
TEACHER 1				1	
TEACHER 2	1				
TEACHER 3		1			
TEACHER 4		1			

4. Computers are dehumanizing

	SD	D	U	A	SA
TEACHER 1		1			
TEACHER 2					
TEACHER 3		1			
TEACHER 4		1			

Missing data:
TEACHER 2 = 1

5. The use of computers should be confined to computer courses

	SD	D	U	A	SA
TEACHER 1		1			
TEACHER 2		1			
TEACHER 3		1			
TEACHER 4	1				

6. Learning computers make high demands on my professional time

	SD	D	U	A	SA
TEACHER 1			1		
TEACHER 2		1			
TEACHER 3		1			
TEACHER 4	1				

7. Computers diminish my role as a teacher

	SD	D	U	A	SA
TEACHER 1	1				
TEACHER 2		1			
TEACHER 3		1			
TEACHER 4	1				

8. Computers further the gap between learners along socio-economic lines

	SD	D	U	A	SA
TEACHER 1		1			
TEACHER 2		1			
TEACHER 3		1			
TEACHER 4				1	

9. I can help others solve computer problems

	SD	D	U	A	SA
TEACHER 1					1
TEACHER 2			1		
TEACHER 3				1	
TEACHER 4				1	

10. Computer skills are essential to my learners

	SD	D	U	A	SA
TEACHER 1				1	
TEACHER 2					
TEACHER 3				1	
TEACHER 4					

Missing data:
TEACHER 2 = 1
TEACHER 4 = 1

11. I would like every learner in my classes to have access to a computer

	SD	D	U	A	SA
TEACHER 1				1	
TEACHER 2					1
TEACHER 3				1	
TEACHER 4					1

12. Computers should be incorporated into the classroom curriculum

	SD	D	U	A	SA
TEACHER 1				1	
TEACHER 2					1
TEACHER 3				1	
TEACHER 4					

Missing data:
TEACHER 4 = 1

13. I would like my learners to be able to use the computer more

	SD	D	U	A	SA
TEACHER 1				1	
TEACHER 2				1	
TEACHER 3		1			
TEACHER 4					1

14. Computers enhance classroom instruction

	SD	D	U	A	SA
TEACHER 1				1	
TEACHER 2				1	
TEACHER 3				1	
TEACHER 4					1

15. Computer skills will help me as a professional

	SD	D	U	A	SA
TEACHER 1					1
TEACHER 2					1
TEACHER 3				1	
TEACHER 4					1

16. More training would increase my use of the computer in the classroom

	SD	D	U	A	SA
TEACHER 1					1
TEACHER 2					1
TEACHER 3		1			
TEACHER 4					

Missing data:
TEACHER 4 = 1

17. Computers make my job easier

	SD	D	U	A	SA
TEACHER 1					1
TEACHER 2				1	
TEACHER 3					
TEACHER 4					1

Missing data:
TEACHER 3 = 1

18. Computers change my role as a teacher

	SD	D	U	A	SA
TEACHER 1					1
TEACHER 2			1		
TEACHER 3		1			
TEACHER 4		1			

Section 3 - The Integration of computers into the classroom

I integrate computers into the classroom …

1. To promote student centered learning

	SD	D	U	A	SA
TEACHER 1					1
TEACHER 2				1	
TEACHER 3				1	
TEACHER 4					1

2. Independent learning

	SD	D	U	A	SA
TEACHER 1				1	
TEACHER 2				1	
TEACHER 3				1	
TEACHER 4				1	

3. Individual instruction

	SD	D	U	A	SA
TEACHER 1				1	
TEACHER 2				1	
TEACHER 3		1			
TEACHER 4				1	

4. To tutor

	SD	D	U	A	SA
TEACHER 1				1	
TEACHER 2			1		
TEACHER 3				1	
TEACHER 4				1	

5. Small group instruction

	SD	D	U	A	SA
TEACHER 1		1			
TEACHER 2				1	
TEACHER 3		1			
TEACHER 4					

Missing data:
TEACHER 4 = 1

6. Cooperative groups

	SD	D	U	A	SA
TEACHER 1		1			
TEACHER 2				1	
TEACHER 3		1			
TEACHER 4					

Missing data:
TEACHER 4 = 1

7. As a problem solving/decision making tool

	SD	D	U	A	SA
TEACHER 1				1	
TEACHER 2			1		
TEACHER 3				1	
TEACHER 4				1	

8. As a research tool for students

	SD	D	U	A	SA
TEACHER 1				1	
TEACHER 2				1	
TEACHER 3					1
TEACHER 4					1

9. As a classroom presentation tool

	SD	D	U	A	SA
TEACHER 1				1	
TEACHER 2			1		
TEACHER 3		1			
TEACHER 4					

Missing data:
TEACHER 4 = 1

10. As a productivity tool

	SD	D	U	A	SA
TEACHER 1				1	
TEACHER 2			1		
TEACHER 3					1
TEACHER 4					1

11. As a reward

	SD	D	U	A	SA
TEACHER 1		1			
TEACHER 2				1	
TEACHER 3				1	
TEACHER 4					

Missing data:
TEACHER 4 = 1

12. As a communication tool

	SD	D	U	A	SA
TEACHER 1					1
TEACHER 2					1
TEACHER 3				1	
TEACHER 4					1

Section 4 - Usability

1. Learners engage in computer-based activities for curricular purposes:

☐ One hour/less than one hour per week ☐ Between 2 and 4 hours per week ☐ More than 4 hours per week

	1 hr/less than 1 hr	Between 2 & 4 hrs	More than 4 hrs
TEACHER 1	1		
TEACHER 2	1		
TEACHER 3	1		
TEACHER 4		1	

2. Tick the learning areas in which computers are used in teaching and learning.

Language
Mathematics
Natural Sciences
Technology
Social Sciences
Economics and Management Sciences
Arts and Culture
Life Orientation
Other. Specify _____

	LANG	MATHS	NS	TECH	SS	EMS	AC	LO	OTHER
TEACHER 1	*	*		*		*	*		
TEACHER 2				*				*	*
TEACHER 3	*	*	*	*	*	*		*	
TEACHER 4	*	*	*		*	*			

3. Indicate in order of priority two learning areas where learners make the most use of computers.

Choice 1:_____

Choice 2:_____

	LANG	MATHS	NS	TECH	SS	EMS	AC	LO	OTHER
TEACHER 1	2	1							
TEACHER 2				1					2
TEACHER 3	1	2							
TEACHER 4	1				2				

	CHOICE 1	CHOICE 2
TEACHER 1	Mathematics	Language
TEACHER 2	Technology	Other (Project Research)
TEACHER 3	Language	Mathematics
TEACHER 4	Language	Social Sciences

4. Tick the purposes for which computers are used in Grade 7:

	a. Drill and practice
	b. Presentation of assignments
	c. Researching Projects
	d. Games and simulation
	e. Problem solving
	f. Data bases
	g. Word processing
	h. Internet
	i. Email
	j. Other (specify) _____

a) **Drill & practice**

	YES	NO
TEACHER 1	1	
TEACHER 2	1	
TEACHER 3	1	
TEACHER 4	1	

b) **Presentation of assignments**

	YES	NO
TEACHER 1	1	
TEACHER 2	1	
TEACHER 3	1	
TEACHER 4	1	

c) **Researching Projects**

	YES	NO
TEACHER 1	1	
TEACHER 2	1	
TEACHER 3	1	
TEACHER 4	1	

d) **Games & simulation**

	YES	NO
TEACHER 1	1	
TEACHER 2	1	
TEACHER 3	1	
TEACHER 4	1	

e) **Problem solving**

	YES	NO
TEACHER 1	1	
TEACHER 2		1
TEACHER 3	1	
TEACHER 4	1	

f) **Databases**

	YES	NO
TEACHER 1	1	
TEACHER 2		1
TEACHER 3	1	
TEACHER 4	1	

g) Word processing

	YES	NO
TEACHER 1	1	
TEACHER 2	1	
TEACHER 3	1	
TEACHER 4	1	

h) Internet

	YES	NO
TEACHER 1	1	
TEACHER 2	1	
TEACHER 3	1	
TEACHER 4	1	

i) Email

	YES	NO
TEACHER 1	1	
TEACHER 2	1	
TEACHER 3	1	
TEACHER 4	1	

j) Other

	YES	NO
TEACHER 1		1
TEACHER 2		1
TEACHER 3		1
TEACHER 4		1

5. Indicate in order of priority the two most important purposes for which computers are used.
(Indicate the choices from the list above.)

Choice 1:_____

Choice 2:_____

	a	b	c	d	e	f	g	h	i	j
TEACHER 1		2			1					
TEACHER 2							2	1		
TEACHER 3		1	2							
TEACHER 4			2				1			

	CHOICE 1	CHOICE 2
TEACHER 1	Problem solving	Presentation of assignments
TEACHER 2	Internet	Word processing
TEACHER 3	Presentation of assignments	Researching Projects
TEACHER 4	Word processing	Researching Projects

6. Rank (from 1-9) what you feel are the best uses of computers in the classroom.
(1 being the best use, followed by 2, and so on)

	a. Drill and practice
	b. Presentation of assignments
	c. Researching Projects
	d. Games and simulation
	e. Problem solving
	f. Data bases
	g. Word processing
	h. Internet
	i. Email
	j. Other (specify) _____

	a	b	c	d	e	f	g	h	i	j
TEACHER 1	9	2	7	8	1	4	3	6	5	
TEACHER 2	7	5	4	6			2	1	3	
TEACHER 3	6	2	1	7	8	9	3	4	5	
TEACHER 4	8	2	3	9	6	5	1	4	7	

TEACHER 1

1	e. Problem solving
2	b. Presentation of assignments
3	g. Word processing
4	f. Data bases
5	i. Email
6	h. Internet
7	c. Researching Projects
8	d. Games and simulation
9	a. Drill and practice

TEACHER 2

1	h. Internet
2	g. Word processing
3	i. Email
4	c. Researching Projects
5	b. Presentation of assignments
6	d. Games and simulation
7	a. Drill and practice

TEACHER 3

1	c. Researching Projects
2	b. Presentation of assignments
3	g. Word processing
4	h. Internet
5	i. Email
6	a. Drill and practice
7	d. Games and simulation
8	e. Problem solving
9	f. Data bases

TEACHER 4

1	g. Word processing
2	b. Presentation of assignments
3	c. Researching Projects
4	h. Internet
5	f. Data bases
6	e. Problem solving
7	i. Email
8	a. Drill and practice
9	d. Games and simulation

7. Could you comment on your factors numbered 1 and 2?

TEACHER 1	Pupils need to find the best way of fulfilling tasks and how to override difficulties which may occur. I also believe that the use of computers makes for a more professional presentation of assignments.
TEACHER 2	*Access to vast info/latest ideas quickly *Most common/available for most aspects in life.
TEACHER 3	Much of their learning takes the form of project work which has to researched and presented in one form or another.
TEACHER 4	These skills are widely used in the workforce.

8. **Tick the item below that you believe should be prioritised regarding computer utilisation at your school.**

Use of computers as a teaching and learning tool in all learning areas.

To teach computer skills

To expose learners to the potential benefits of computers in everyday life

Other (specify) _____

	Teaching & learning Tool	Computer skills	Benefits of computers in everyday life	Other
TEACHER 1			1	
TEACHER 2		1		
TEACHER 3	1			
TEACHER 4		1		

9. **The level of engagement with computer-based tasks for Grade 7 learners is …**

Very difficult Difficult Just right Easy Very easy

	Very difficult	Difficult	Just right	Easy	Very easy
TEACHER 1			1		
TEACHER 2			1		
TEACHER 3			1		
TEACHER 4			1		

Could you explain why?

TEACHER 1	They have almost all been using computers since Grade 1 and are given task relevant to their level of competency at this stage.
TEACHER 2	-
TEACHER 3	It depends on the task – creating a Database or PowerPoint presentation are more difficult than creating a Word document.
TEACHER 4	Lessons in the ICT Centre are designed for specific ages and are also integrated. Different levels of capability are also taken into account when planning lessons.

10. Tick the one item that best describes the way in which learners in Grade 7 use computers.

For individual work For group/collaborative work For both Other (specify) _____

	For individual work	For group/collaborative work	For both	Other
TEACHER 1	1			
TEACHER 2	1			
TEACHER 3			1	
TEACHER 4			1	

11. Tick which of the following computer skills are taught to the Grade 7 learners at your school.

a) Basic principles of computers
b) Word processing
c) Spreadsheets
d) Presentation graphics
e) File management
f) Database
g) Desktop publishing
h) Web-design
i) Programming skills
j) Systems analysis and design
k) Ethics (acceptable use, plagiarism, hacking)
l) Using the Internet (email, world-wide web)
m) Information skills (research on CD-ROMS, Internet)
n) Other (specify) _____

a) Basic principles of computers

	YES	NO
TEACHER 1	1	
TEACHER 2	1	
TEACHER 3	1	
TEACHER 4	1	

b) Word processing

	YES	NO
TEACHER 1	1	
TEACHER 2	1	
TEACHER 3	1	
TEACHER 4	1	

c) Spreadsheets

	YES	NO
TEACHER 1	1	
TEACHER 2	1	
TEACHER 3	1	
TEACHER 4	1	

d) Presentation graphics

	YES	NO
TEACHER 1	1	
TEACHER 2	1	
TEACHER 3	1	
TEACHER 4	1	

e) File management

	YES	NO
TEACHER 1	1	
TEACHER 2		1
TEACHER 3	1	
TEACHER 4	1	

f) Database

	YES	NO
TEACHER 1	1	
TEACHER 2		0
TEACHER 3		0
TEACHER 4	1	

g) Desktop publishing

	YES	NO
TEACHER 1	1	
TEACHER 2		1
TEACHER 3	1	
TEACHER 4	1	

h) Web-design

	YES	NO
TEACHER 1		1
TEACHER 2		1
TEACHER 3	1	
TEACHER 4		1

i) **Programming skills**

	YES	NO
TEACHER 1		1
TEACHER 2		1
TEACHER 3		1
TEACHER 4		1

j) **Systems analysis and design**

	YES	NO
TEACHER 1		1
TEACHER 2		1
TEACHER 3		1
TEACHER 4		1

k) **Ethics (acceptable use, plagiarism, hacking)**

	YES	NO
TEACHER 1		1
TEACHER 2		1
TEACHER 3	1	
TEACHER 4	1	

l) **Using the Internet (email, world-wide web)**

	YES	NO
TEACHER 1	1	
TEACHER 2	1	
TEACHER 3	1	
TEACHER 4	1	

m) **Information skills (research on CD-ROMS, Internet)**

	YES	NO
TEACHER 1	1	
TEACHER 2	1	
TEACHER 3	1	
TEACHER 4	1	

n) **Other**

	YES	NO
TEACHER 1		1
TEACHER 2		1
TEACHER 3		1
TEACHER 4		1

12. For Grade 7 indicate, in order of priority, what you feel the three most important skills are (from the list in qu. 11.).

Choice 1:_____

Choice 2:_____

Choice 3:_____

	a	b	c	d	e	f	g	h	i	j	k	l	m	n
TEACHER 1	1	2			3									
TEACHER 2		1										2	3	
TEACHER 3					3						1	2		
TEACHER 4		1					3						2	

	CHOICE 1	CHOICE 2	CHOICE 3
TEACHER 1	Basic principles of computers	Word processing	File management
TEACHER 2	Word processing	Using the Internet (email, world-wide web)	Information skills (research on CD ROMS, Internet)
TEACHER 3	Ethics (acceptable use, plagiarism, hacking)	Using the Internet (email, world-wide web)	File management
TEACHER 4	Word processing	Information skills (research on CD ROMS, Internet)	Desktop Publishing

13. Rank (from 1-6) what you feel the difficulties are with using computers in the classroom.
(1 indicating the top difficulty, followed by 2, and so on).

	a. Not enough computers available in classrooms
	b. Insufficient funds available for purchase of equipment
	c. Little known about how children learn when using computers
	d. Teachers have to give up important preparation time to become familiar with computers
	e. Not enough teachers with both teacher and specialised training - key resource people
	f. Lack of suitable in-service courses for teachers

TEACHER 1

1	f. Lack of suitable in-service courses for teachers
2	d. Teachers have to give up important preparation time to become familiar with computers
3	e. Not enough teachers with both teacher and specialised training - key resource people
4	a. Not enough computers available in classrooms
5	b. Insufficient funds available for purchase of equipment
6	c. Little known about how children learn when using computers

TEACHER 2 – Spoilt data

TEACHER 3

1	d. Teachers have to give up important preparation time to become familiar with computers
2	c. Little known about how children learn when using computers
3	b. Insufficient funds available for purchase of equipment
4	e. Not enough teachers with both teacher and specialised training - key resource people
5	f. Lack of suitable in-service courses for teachers
6	a. Not enough computers available in classrooms

TEACHER 4 – Teacher stated no difficulties.

Section 5 – Importance of computers

1. Computers are valuable tools that can be used to improve the quality of education.

	SD	D	U	A	SA
TEACHER 1					1
TEACHER 2				1	
TEACHER 3					1
TEACHER 4					1

2. The use of computers helps provide a better learning experience

	SD	D	U	A	SA
TEACHER 1					1
TEACHER 2			1		
TEACHER 3				1	
TEACHER 4					1

3. It is important for learners to learn about computers in order to be informed citizens

	SD	D	U	A	SA
TEACHER 1				1	
TEACHER 2				1	
TEACHER 3		1			
TEACHER 4				1	

4. The use of the computer increases motivation in the learners toward learning.

	SD	D	U	A	SA
TEACHER 1				1	
TEACHER 2			1		
TEACHER 3				1	
TEACHER 4					1

5. Computers stimulate creativity in learners

	SD	D	U	A	SA
TEACHER 1				1	
TEACHER 2			1		
TEACHER 3				1	
TEACHER 4				1	

6. Computers help learners to work with one another

	SD	D	U	A	SA
TEACHER 1				1	
TEACHER 2			1		
TEACHER 3				1	
TEACHER 4				1	

7. Rank (from 1-10) what you perceive as the most important objectives for computer use with Grade 7 learners? (1 indicating the most important objective, followed by 2, and so on).

	a. Get information or ideas
	b. Express self in writing
	c. Mastering skills
	d. Computer skills
	e. Analyse information
	f. Remediation
	g. Learn to collaborate
	h. Learn to work independently
	i. Present Information to an audience
	j. Communicate electronically

	a	b	c	d	e	f	g	h	i	j
TEACHER 1	5	9	1	3	4	6	10	8	7	2
TEACHER 2	3	4	5	1	10	9	6	7	8	2
TEACHER 3	1	4	5	6	9	7	2	8	10	3
TEACHER 4	4	8	5	1	6	10	7	2	9	3

TEACHER 1

1	c. Mastering skills
2	j. Communicate electronically
3	d. Computer skills
4	e. Analyse information
5	a. Get information or ideas
6	f. Remediation
7	i. Present Information to an audience
8	h. Learn to work independently
9	b. Express self in writing
10	g. Learn to collaborate

TEACHER 2

1	d. Computer skills
2	j. Communicate electronically
3	a. Get information or ideas
4	b. Express self in writing
5	c. Mastering skills
6	g. Learn to collaborate
7	h. Learn to work independently
8	i. Present Information to an audience
9	f. Remediation
10	e. Analyse information

TEACHER 3

1	a. Get information or ideas
2	g. Learn to collaborate
3	j. Communicate electronically
4	b. Express self in writing
5	c. Mastering skills
6	d. Computer skills
7	f. Remediation
8	h. Learn to work independently
9	e. Analyse information
10	i. Present Information to an audience

TEACHER 4

1	d. Computer skills
2	h. Learn to work independently
3	j. Communicate electronically
4	a. Get information or ideas
5	c. Mastering skills

6	e. Analyse information
7	g. Learn to collaborate
8	b. Express self in writing
9	i. Present Information to an audience
10	f. Remediation

Section 6 – Computers For Learners

Instructions: Place an 'x' between each adjective pair to indicate how you feel about the object.

E.g. good ___ X ___ ___ ___ ___ ___ bad

(Placing the 'x' nearer to 'good' would indicate that you feel computer use is closer to good than bad)

For **my learners using computers in the classroom** is:

1.	important	___ ___ ___ ___ ___ ___ ___	unimportant
2.	boring	___ ___ ___ ___ ___ ___ ___	interesting
3.	relevant	___ ___ ___ ___ ___ ___ ___	irrelevant
4.	exciting	___ ___ ___ ___ ___ ___ ___	unexciting
5.	means nothing	___ ___ ___ ___ ___ ___ ___	means a lot
6.	appealing	___ ___ ___ ___ ___ ___ ___	unappealing
7.	fascinating	___ ___ ___ ___ ___ ___ ___	mundane
8.	worthless	___ ___ ___ ___ ___ ___ ___	valuable
9.	involving	___ ___ ___ ___ ___ ___ ___	uninvolving
10.	not needed	___ ___ ___ ___ ___ ___ ___	needed

1.	IMPORTANT	UNDECIDED	UNIMPORTANT
TEACHER 1	1		
TEACHER 2	1		
TEACHER 3	1		
TEACHER 4	1		
2.	**BORING**	**UNDECIDED**	**INTERESTING**
TEACHER 1			1
TEACHER 2		1	
TEACHER 3			1
TEACHER 4			1
3.	**RELEVANT**	**UNDECIDED**	**IRRELEVANT**
TEACHER 1	1		
TEACHER 2	1		

TEACHER 3	1		
TEACHER 4	1		
4.	**EXCITING**	**UNDECIDED**	**UNEXCITING**
TEACHER 1	1		
TEACHER 2		1	
TEACHER 3	1		
TEACHER 4	1		
5.	**MEANS NOTHING**	**UNDECIDED**	**MEANS A LOT**
TEACHER 1			1
TEACHER 2		1	
TEACHER 3			1
TEACHER 4			1
6.	**APPEALING**	**UNDECIDED**	**UNAPPEALING**
TEACHER 1	1		
TEACHER 2	1		
TEACHER 3	1		
TEACHER 4	1		
7.	**FASCINATING**	**UNDECIDED**	**MUNDANE**
TEACHER 1	1		
TEACHER 2		1	
TEACHER 3	1		
TEACHER 4	1		
8.	**WORTHLESS**	**UNDECIDED**	**VALUABLE**
TEACHER 1			1
TEACHER 2			1
TEACHER 3			1
TEACHER 4			1
9.	**INVOLVING**	**UNDECIDED**	**UNINVOLVING**
TEACHER 1	1		
TEACHER 2	1		
TEACHER 3	1		
TEACHER 4	1		
10.	**NOT NEEDED**	**UNDECIDED**	**NEEDED**
TEACHER 1			1
TEACHER 2			1
TEACHER 3			1
TEACHER 4			1

Section 7 – Individual responses

1. Do you perceive any benefits for learners in using computers? If so, what might they be and why?

TEACHER 1	I think this has been covered in previous questions.
TEACHER 2	Stay with technology and uses. Important for business and everyday life.
TEACHER 3	Their thoughts are more easily organised. Changes can be made quickly. It's a skill they will need in the business world. Layout and presentation of tasks is organised and well laid out.
TEACHER 4	Preparation for the workforce. When guided correctly, the learner who does not enjoy reading, is "forced" to read.

2. Do you perceive any disadvantages for your learners in using computers? If so, what might they be and why?

TEACHER 1	They could become too dependent on computer generated material and lose some of their personal creativity. I also feel that some games are particularly addictive.
TEACHER 2	Only lack of computers leads to being disadvantaged in class.
TEACHER 3	Often makes them lazy about looking for information and putting it into their own words.
TEACHER 4	No disadvantages.

3. How would you like Information Technology in your classroom/school to develop? (Or, alternatively, to be reduced.)

TEACHER 1	I am very happy with way the IT is developing, but would like them to be able to access Internet from their own workstations simultaneously. I should also like the opportunity to broaden my personal knowledge.
TEACHER 2	New here – so don't know complete involvement.
TEACHER 3	Teachers need more training and help with integrating the use into the classroom.
TEACHER 4	-

APPENDIX K, 1 – SCHOOL A Learner Open-ended Question Responses

	SCHOOL A LEARNER QUESTIONNAIRE DATA
QU. 20	**Why do you like doing these things on the computer?**
1	Because they are interesting.
2	Because at least we not doing work at school.
3	Because you don't put as much effort in as if you do when you d it manually.
4	Because you aren't able to do these things without it.
5	They are great
6	I like it because it's fun and nice to know others.
7	Because it s fun and very easy, no mess.
8	I like doing these things because I find them interesting, fun, relaxing, easy and the "stuff" I like doing is also some of the "stuff" I like doing on the computer e.g. drawing, school projects, etc.
9	I like it because a computer is quicker and you can save your work.
10	Because then I'm involved with what's happening around me.
11	Because they are fun
12	Why, because it works faster
13	Because they're fun and entertaining
14	They are enjoyable.
15	Because its enjoyable
16	I like playing games because its interesting and its lots of fun
17	So we can get a good job.
18	Because it isn't that difficult.
19	Because it is fun.
20	Because they are fun and I enjoy them
21	Because these things we learn from and you need to learn to get a good education.
22	Because I enjoy the thing that we do or play games.
23	It s very fun and its cool
24	Because I find most of them very enjoyable.
25	Because I feel I enjoy myself much better doing things I like.
26	It is fun and I enjoy it.
27	Because it is enjoyable.
28	I can learn more about them.
29	Because it helps.
30	When you write your hand gets sore but when you type it doesn't

	SCHOOL A LEARNER QUESTIONNAIRE DATA
QU. 21	**What is the worst thing about computers? Why?**
1	Nothing
2	It can crash then you loose your memory.
3	Typing it takes too long.
4	The worst thing is when it crashes because then if you didn't save your work you'll have to do it all again.
5	Too short.
6	School projects because you must do a hour of it.
7	Freezing because some times you have to redo work.
8	The worst thing is when the mouse or the computer does not work because it makes the work take double the time and makes me lose my concentration by making me concentrate on the mis-functioning mouse of the computer.
9	If the computer is too slow and if my mouse does not work properly.
10	I think nothing.
11	Nothing
12	It is hard
13	Hard to understand – don't know.
14	Mouses. They are irritating.
15	Freezing! They you lose information.
16	I don't' like typing because I always make mistakes.
17	When you have to restart.
18	If you don't know what to do because then I have to ask my friends and sometimes they get irritated.
19	Sometimes the computer is very slow and it's very irritating.
20	When we do some work that I don't enjoy, because then I don't enjoy.
21	Typing, it takes too long.
22	Sometimes I don't know what to do, then I will be confused sometimes, then I put up my hand then my teacher comes and helps me.
23	If it freezes
24	Sometimes it is really slow and it takes really long.
25	Making programmes and learning about programmes but once you get used to it you love it.
26	That the lessons are too short.
27	When something goes wrong, I don't know how to fix it.
28	I enjoy them all, but I hat when it gets broken.
29	It takes time to load.
30	When you're drawing and you can't get the picture the way you want it.

	SCHOOL A LEARNER QUESTIONNAIRE DATA
QU. 25	**Why do you think you use computers in Grade 7?**
1	-
2	Because it prepares us for high school.
3	So that we can learn how to use them so we are prepared for future use.
4	So that we can get out work done quicker and neater.
5	To help learning.
6	Because they are trying to teach us something so we can get a job easier.
7	Because it's neat and looks good when I do my work.
8	I think we use the computer because we all need to learn how to use a computer for the jobs nowadays and for fun.
9	We use computers to learn computer skills. When we get jobs we will need these skills and the experience. Because almost everything nowadays is based on technology.
10	Because knowing how to use a computer is very helpful for when we are working.
11	Because it is important.
12	To get us ready for Grade 8.
13	Because it's easier faster and more efficient.
14	Saves time and is helpful.
15	So we can learn what to do with them. Say we're at a business and someone asks you to do something on the computer, and you can't do anything, so they blame you.
16	To learn.
17	-
18	To teach us how to use the computer and to make it easier for our learning and education.
19	To learn skills for when you need a job.
20	Because when we are older most jobs you will need to now how to use a computer.
21	To help you with high school and your career.
22	To learn everything that you need to know and planning in high school.
23	It is very fun.
24	Because it's enjoyable and I think that it helps my knowledge a lot.
25	To learn how to use a computer, to enjoy yourself and to help you in the future.
26	It is important to learn how to use a computer
27	So that we can be exposed to modern technology.
28	To help us in university.
29	To help use do work.
30	It might help you later in life.

APPENDIX K, 2 – SCHOOL B Learner Open-ended Question Responses

	SCHOOL B LEARNER QUESTIONNAIRE DATA
QU. 20	Why do you like doing these things on the computer?
1	Because it helps me to keep up and to be able to go at my own pace.
2	They can help me a lot with my school work.
3	I like it because you will never make a mistake.
4	Because it relaxes me when I'm stressing out about something.
5	It's faster and it has all the information one needs.
6	They are there mostly for our own enjoyment and we are not told exactly how to do them.
7	I like these things because it helps me with my school work.
8	I like doing these things because I can research things on the internet and communicate over email.
9	They are fun.
10	I like doing these things because using computers makes it easier to use and funner.
11	I like doing these things on the computer because they are fun and interesting.
12	I like doing these things on the computer because it's very fun.
13	I like doing these things on the computer because it is very entertaining and educational
14	For it's fun and I enjoy doing those things and no real, test or things like that on it so it's in a way relaxing.
15	I like it because it helps me to do my projects. I learn a lot when I use the internet.
16	I like doing these things because it is fun and you can learn from it.
17	I like using them because they are interesting, fun, enjoyable and I get to know things better.
18	I love using a computer, I think it is great. I love playing games and discovering new things on the games.
19	Because it makes me relax
20	I like it because you learn a lot but you also have lots of fun. You understand the computer its not difficult.
21	Because they're fun, I learn more and it's just what I do when I work on the computer.
22	I like doing these things on the computer because it's what I usually do.
23	They help me learn a lot in computer lessons and learn new things for ht future.
24	I like doing these things on the computer because it gives me enjoyment and an opportunity to learn.
25	I like it because going on the Internet is fun and by going on it helps me more with my projects for research.
26	It opens my imagination and challenges my brain and it's really fun.

	SCHOOL B LEARNER QUESTIONNAIRE DATA
QU. 21	**What is the worst thing about computers? Why?**
1	That we can't use the internet anymore because of the phone bill and now I can't download anymore.
2	Nothing.
3	When it takes long to load a game or something
4	I wouldn't say that there's anything bad about computers.
5	Typing I can't type fast.
6	Having to type out long project or essays. I'm a very slow typer.
7	The worst thing is when the computer freezes. Then you can't do anything.
8	Looking for something you can't find.
9	Typing its boring.
10	The worst things about computers is that they're too complicating and advance for me; I find it hard to learn how to work a computer.
11	The worst thing about computers is typing because it takes a lot of time.
12	The worst thing about computers is nothing because I enjoy doing things on the computer.
13	My worst thing is typing because my hand gets tired and I get bored quickly.
14	Viruses! For it messes up your pc and jams it and doesn't allow you to work as quickly as you'd want to.
15	When it freezes because you lose al your work.
16	The worst things about computer are typing long.
17	Typing, because it's boring and there's nothing interesting or fun while you doing it.
18	Nothing. I like everything.
19	Nothing it is all fun
20	That we don't have longer lessons like for tow hours because I really enjoy it and we have a great teacher.
21	At school, you have to pay if you print out pages even if you are doing projects. Not fair.
22	The worst thing about computers is typing stories and writing personal info, because I don't enjoy those type of boring things.
23	The worst thing about computers is the loading I hate it when it loads.
24	When we have to do work for projects because it takes up most of my time.
25	For me there is not worse thing about computers "cause I like everything".
26	Nothing is the worst thing in computers.

	SCHOOL B LEARNER QUESTIONNAIRE DATA
QU. 25	**Why do you think you use computers in Grade 7?**
1	To make work easier and to help me and my friend or fellow peers in Grade 7.
2	So you are prepared for High School and later in life.
3	To help us in our education.
4	To get us ready for the computers in High School
5	So that we can use the internet to find more info about subjects and it's always here Monday-Thursday.
6	In our lives ahead like our jobs we will need computers for most things. So we have to know how to use them.
7	It is important because it teaches us new things and helps with projects.
8	So we know computers very will for when we are older and to research for projects.
9	We use computers because it helps us for the future.
10	I think we use computers to learn about the technology stage to make our lives easier and to learn how to use computers so when we grow up we will be able to be educated about software and we also use them for our enjoyment.
11	I think we use computers in Grade 7 because to make work easier to do because we have a lot.
12	To do work, have lot so f fun and learn about a computer.
13	We need it because we have a lot of projects and we need information doing the project so using the computer helps me a lot.
14	We use them for it teaches us new skills and will help us in later life, for now nearly all jobs require computer skills.
15	For projects because we do a lot of projects. For our future as well.
16	We use computers in Grade 7 because it can help in life.
17	To know them better and when we grow up we would know how to work them.
18	I think we use it because we need to improve our computer skills to make us more independent in our adulthood.
19	To help us when we are older.
20	We use computer in Grade 7 because we can get a lot of information from it. It's not difficult to use and it saves us a lot of time because we type it out and print we don't have to write everything out.
21	So that we can be ready for higher standards.
22	To learn and to know about each other.
23	To learn a skill for the future so you can know what to do.
24	To improve our skills in life and prepare us for High School.
25	We use computers in Grade 7 to teach how exactly you need to use a computer and its helpful for one day when we are older.
26	So that it can help us get information on project and knowledge of how to use it.

APPENDIX K, 3 – SCHOOL C Learner Open-ended Question Responses

	SCHOOL C LEARNER QUESTIONNAIRE DATA
QU. 20	Why do you like doing these things on the computer?
1	Because its fun and we need to learn.
2	Fun, educational.
3	They are fun and I can communicate with my friends from other schools. We don't have very many nice games, but some of them are good.
4	I enjoy them because they are fun and sometimes educational
5	I like playing games because it is fun and interesting
6	Well it is lots of fun. I especially like to write stories. And it is a plus that you learn too.
7	It's because they are interesting and you learn a lot, it also helps with hand-eyes coordination.
8	It is fun.
9	It's easy.
10	It's fun!
11	I love playing games.
12	Because when we are finished with whatever we were doing then I play a game.
13	Most games on computers are fun. The internet is interesting because it's the best information finder for projects and I love going on www.lyrics.com. Receiving emails are nice because I like writing to friends.
14	They are more fun than normal board games.
15	They pass the time and are fun.
16	Because it's fun, enjoyable and helpful.
17	I like doing it because it's fun and I would rather be on a computer than in a hot classroom, I learn more when I'm on a computer!
18	I like doing these things because I have fun doing them and because they aren't like just being in the classroom.
19	More interesting.
20	I enjoy playing games because they are different to normal games (board games).
21	I like doing things on the computer, because it makes things seem more simple.
22	I like doing things on the computer (my project) because it's much quicker and much more easier.
23	Because it is cool.
24	It doesn't take long to type and you can check spelling and punctuation. Going on the internet has the most interesting things.
25	It's enjoyable and better than other things.
26	Because it's fun and easier.
27	It's fun, easier to learn and you can work by yourself instead of a teacher teaching you.
28	I like doing these things on the computer because when you are sending/receiving

	emails you get to communicate with your friends. When working on projects everything is always so much more organised and tidier.
29	It's lot's of fun!
30	They're fun and interesting
31	It relaxes me so I can go what ever pace I like. I can learn and I love typing.
32	I like these things because you can communicate with someone else overseas.

	SCHOOL C LEARNER QUESTIONNAIRE DATA
QU. 21	**What is the worst thing about computers? Why?**
1	Viruses are the worst because they destroy your files.
2	Hurts your eyes because they're so bright
3	They get use for education. I think of my computer at home as a recreational tool, I listen to music, send emails, surf the net, and play games, not use encyclopaedias and learning boring things.
4	Work. It's really boring.
5	The time it takes to load big things.
6	I would have to say – loading time. It takes times to get into a site because it really wastes time.
7	They are pretty difficult to work with.
8	They get viruses which is irritating because I lose all my work.
9	You get viruses that crash the computer.
10	They age quickly.
11	The internet takes to long.
12	The worst thing about computer is when it breaks. Because then "I" can't fix it my self.
13	We are not allowed to go on the internet in free time because it takes too many megabytes.
14	Viruses because you can't use them when they are being fixed.
15	They are expensive because they cost a lot of money.
16	It hurts your eyes if you stare at it long and also you get viruses on the computer.
17	I think the worst is then you have just written a WHOLE project out on the computer and then it freezes and you loose everything!
18	I hate it when my computer crashes or I can't do what I want to on it.
19	Being slow when downloading.
20	When you are doing work on the computer and it crashes and you lose all your information.
21	The worst thing for me is: when I am doing something really interesting, the computer freezes and then I have to sort it out and start all over again.
22	It is when you press something and you don't know what to do.
23	Nothing
24	Doing maths games like Maths Blaster it is so boring but we have to do it sometimes.

25	They are too slow. You have to wait to load and there are too many restrictions.
26	Typing because I am slow at it.
27	When they re slow, doesn't save information properly and have problems.
28	If the power goes off and your computer shut down and you are doing your project and you haven't saved it then you have to type it out all over again.
29	When I don't know how to use a programme
30	Logging in and out, it takes too much time.
31	You have to clean them and they get viruses.
32	When the computer switches off, or doesn't save properly.

	SCHOOL C LEARNER QUESTIONNAIRE DATA
QU. 25	**Why do you think you use computers in Grade 7?**
1	To research and learn
2	To help us learn
3	To help us with research and work
4	It teaches us to use technology which will equip us further in our lives.
5	It helps you to improve your work and it's good to start early with computers and it's fun.
6	I think to learn about different topics, research work and help us with projects.
7	To help with work.
8	To have fun and learn!
9	So we can learn more and our work is neater.
10	It helps me more with work.
11	They help me when we do projects.
12	Because Grade 7's have more projects to do and more things on our minds.
13	Mainly for projects. It has some of the best info. Games are entertaining.
14	To learn about technology.
15	It's a form of education.
16	To help us to find info and to make Grade 7 enjoyable.
17	We use it because it makes school more fun and it's really interesting!
18	I use them to work and play on. They help you to teach me about them.
19	For projects
20	To help do project and for the jobs we will get in the future.
21	We use computers in Grade Seven, because it will help us in the near future and in other activities.
22	They help for projects and research and I learn quite a lot.
23	So we can do our work faster and much more fun activities.
24	For essays and projects.
25	To learn how to use them for later in our lives.
26	Schoolwork and learn to build them.
27	To teach us skills.
28	I think that we use computers in Grade 7 because computers are a skill most

	people must know. For instance if you want to study computers in university and you don't know a thing about it then it's very unenjoyable.
29	It might help us in the future.
30	To help us with work at school and to educate us about them.
31	To learn to type because it is compulsory when you get older.
32	We use computers to find research on projects and to improve our computer skills.

APPENDIX K, 4 – SCHOOL D Learner Open-ended Question Responses

	SCHOOL D LEARNER QUESTIONNAIRE DATA
QU. 20	Why do you like doing these things on the computer?
1	They are fun and they teach you new things.
2	They are fun and interesting.
3	Because it is really fun to play games and you finfish your work in a much quicker period of time.
4	It's fun yet educational.
5	Because the computer gives nice work and is great.
6	I like playing games because it's fun and exciting.
7	Because they are fun and you don't have to put a lot of effort into it.
8	It helps me learn more about the world and what's going on. You can have a lot of fun.
9	I like playing games because it's better and funner than doing work! I like sending emails to check up on my friends. I like to use the Internet to find out what's happening and going on lyrics.com
10	Because I enjoy the selection of games it has and I like the typing we do.
11	I like it cause I don't get bored on the computer, it makes my work neater and I love sending emails.
12	It's because when you have nothing to do you go on the computer and play games, surf the Internet and watch films.
13	I think it is fun and it also teaches us things.
14	It makes a fun lesson when you come to computers because when you're finished we can do these things.
15	Playing games.
16	Yes it helps me to do work e.g. "the Internet"
17	Well it will improve my computer skills and my typing skills. I also enjoy playing games.
18	Because, it's fun and enjoyable.
19	It's fun.
20	Because it is quicker.
21	I find computers interesting and try do as many things as I can. I like to be involved.
22	It is very interesting to find things out on the Internet and new stuff how to work on a computer.
23	It does everything neatly and efficiently.
24	Playing games= It's fun and Interesting. Internet= Free, go to lots of sites for project and fun!
25	I enjoy playing games because it is fun. Using the Internet. I like to fin out new and interesting things.
26	I like them because they allow me to get my work done quick and efficiently and

	they allow me to explore the technology provided to me.
27	They are all fun: e.g. using internet. I go onto lyrics!
28	I enjoy sending emails and playing games.
29	They are fun and since our internet at home is buggered, I can't surf @ home.
30	Its fun.
31	It's easy and exciting.
32	School projects and using the internet is great for me because it allows me to do my work and also to have fun.

	SCHOOL D LEARNER QUESTIONNAIRE DATA
QU. 21	**What is the worst thing about computers? Why?**
1	You might sometimes get confused.
2	Typing.
3	When you get stuck, because it takes up your time.
4	Memory. Too little means the computers are slow.
5	Not knowing how to do something because you get irritated.
6	Typing is the worst thing for me because your fingers much move the whole time.
7	That they are slow, especially when you're in a hurry to get your work done.
8	When you don't understand what's going on, because at the end of the day you have to hand in a project and you don't know what to do and then you fail.
9	Typing because it is boring and I have my own way of typing.
10	School projects because they take forever to do.
11	When your memory is erased, because you lose you hard work. When you computer is slow, it wastes time.
12	Typing and using educational CD-ROMs because it's sometimes boring but we also need to know it for our future.
13	Nothing!
14	Doing projects and looking up research.
15	Projects, work.
16	Projects because we don't get to play games.
17	When the computer is not working because there's no one to help you.
18	Virus attacks and slow computers
19	Teacher shouts at us.
20	When it don't work
21	When the computer freezes as you can lose a lot of your work if you have not saved.
22	Nothing for me.
23	Some old models are too slow.
24	When you doing a computer project and you don't know how to do something and you can't ask because then the teachers giving you the answer.
25	The projects and assignments because I do not understand them and I find it very difficult.

26	The worst thing about computer is that they only allow us a certain period of time.
27	Work, when we have to do it!
28	There is quite a lot of work and if you miss one lesson you fall behind.
29	Typing exercises because we have to look at the screen and cover our hands with clothes so we can't see the letters.
30	Teacher is a bit strict.
31	Almost every week we get something new to do and only have 1 hour to do it unless we come to computer club.
32	Logging on and shutting down it is just frustrating.

	SCHOOL D LEARNER QUESTIONNAIRE DATA
QU. 25	**Why do you think you use computers in Grade 7?**
1	To teach us about working skills because with most jobs today you need to have computer skills.
2	To teach us skills.
3	Because when you grow up you may want a job to do with computers and to teach you to type faster.
4	For projects and to speed up work.
5	Because when we get a job that is a skill we might need.
6	I think so because it can improve our life ahead.
7	Because we need to learn the right way to use the computer so when we go to high school we know how to type and use the computer.
8	To learn how to use information communication technology. In other High Schools that you may go to you may not get any computer lessons and there might not be computers that the students can use and then at least we have learned.
9	So when you get a job most jobs you need to know how to use a computer and when you get projects you can make your work more presentable. And you learn things.
10	To learn the skills for when you're an adult.
11	You use them to make work easier, to save time, to learn how to use one and to make work neater.
12	It's because in High School we need to know about the computer and if we don't we will get nowhere in life because in every job we need to know about the computer.
13	To teach us how to use it in business life, so that we can get a better job.
14	To improve our typing skills and so we know how to use a computer at work when we're older.
15	To promote the skills of learners so they may prosperate in that area.
16	To improve with our skills and to know what we are doing when we are older.
17	To get a good education, to pass computers and to get into a good high school.
18	To improve our computer skills coz in the world today everyone uses computers.
19	To play games.

20	To work.
21	To prepare us for the future.
22	To find out new things and you have to learn how to work on a computer because next we going to High School and you need to know all these things. That is why we have computers at our school to prepare us in High School.
23	I think it makes working much more easier and in some jobs you will need to use a computer.
24	For projects it makes your work much neater and much more colourful. TO learn how to type without looking at the screen. And most important to learn different skills.
25	We use computers in Grade 7 to help us in a later stage of life. We can also get a lot of information form the assignments. We can also take less time typing on the computer with the practise we get in Grade 7 computer lessons.
26	In Grade 7 we use a computer to help us understand the concept and to help us when we use computers in later life.
27	So we can use our skills in further life!
28	You need to use it because when you grow up and get a job you will most likely need to know how to use a computer & it saves time.
29	I think we do use them because in High School you use them a lot, and in Grade 7 we have less time on our hands.
30	To learn how to work them for when you get older.
31	Most of the different jobs have to do with computers. So you need to know how to use them.
32	To improve our computer skills and also somewhere in life you will have to be able to use one.

APPENDIX L –Learner Open-ended Questions' Response Categories

LEARNER QUESTIONNAIRE, Open-ended Questions Categories

QU 20 – Why do you like doing these things on the computer?

a. Entertaining - "Because it's fun and enjoyable"
b. Not difficult - "It's easy"
c. Efficient - "I like it because a computer is quicker and you can save your work"
d. Relaxing - "Because it makes me relax"
e. Education - "I like doing these things because it helps me with my school work"
f. Other

QU 21 – What is the worst thing about computers? Why?

a. Viruses - "Viruses are the worst because they destroy your files"
b. Computer malfunctions- "When the computer switches off, or doesn't save properly."
c. Typing - "Typing, it takes too long"
d. Difficult - "Hard to understand - don't know"
e. Age of the computer - "Some old models are too slow."
f. Time - "The lessons are too short"
g. Education - "Work it's really boring"
h. Nothing - "Nothing"
i. Teacher - "Teacher shouts at us"
j. Other

QU 25 – Why do you think you use computers in Grade 7?

a. High School - "So that we can be ready for higher standards"
b. Future - "We use computers because it helps us for the future"
c. Schoolwork - "To help us with research and work"
d. Learning - "To help learning"
e. Skills - "To teach us skills"
f. Efficiency - "Saves time and is helpful"
g. Other

APPENDIX M – Preliminary Developed Learner Tables, Comparing the Four Schools

SECTION 1

COMPUTER ENJOYMENT	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1. Using computers in lessons makes schoolwork more enjoyable.					
School A		1	1	7	21
School B		1	4	10	11
School C			2	8	22
School D		2	6	12	12
TOTAL	**0**	**4**	**13**	**37**	**66**
2. I concentrate on a computer when I use one.					
School A		2	2	8	18
School B	1	2	3	13	6
School C	1	1	7	18	5
School D		4	7	20	
TOTAL	**2**	**9**	**19**	**59**	**29**
3. Using a computer is difficult.					
School A	18	6	2	1	2
School B	9	8	2	1	3
School C	15	14	1	1	1
School D	12	8	4	4	2
TOTAL	**54**	**36**	**9**	**7**	**8**
4. The use of the computer makes me feel more involved in the lessons.					
School A	1	2	4	8	14
School B		2	4	6	12
School C		3	12	13	4
School D	1	3	8	14	5
TOTAL	**2**	**10**	**28**	**41**	**35**

Missing data:
School A: Qu. 3 = 1; Qu. 4 = 1
School B: Qu. 2 = 1; Qu. 3 = 3; Qu 4 = 2
School D: Qu. 2 = 1; Qu. 3 = 2; Qu. 4 = 1

SECTION 2

COMPUTER IMPORTANCE	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
5. I believe that it is very important for me to learn how to use a computer.					
School A	1		1	4	24
School B		1	1	5	19
School C		1	2	10	19
School D		1	3	8	20
TOTAL	**1**	**3**	**7**	**27**	**82**
6. I know that computers give me opportunities to learn new things.					
School A	1			4	25
School B	1			9	16
School C			1	10	21
School D			3	12	17
TOTAL	**2**	**0**	**4**	**35**	**79**
7. Computer skills will be essential to my working life.					
School A	1	1		5	22
School B			4	9	13
School C		1	5	9	17
School D		1	3	10	18
TOTAL	**1**	**3**	**12**	**33**	**70**
8. Using a computer allows me to be more creative and do things I have not been able to do in the past.					
School A		1	2	9	18
School B		2	3	10	11
School C		2	7	12	11
School D		2	4	11	14
TOTAL	**0**	**7**	**16**	**42**	**54**
9. Computers have helped me produce work that I am really proud of.					
School A	1		2	7	20
School B		1	4	8	13
School C	2		5	13	12
School D		3	9	14	6
TOTAL	**3**	**4**	**20**	**42**	**51**
10. I learn more quickly on a computer.					
School A	4	1	3	10	12
School B	1	4	6	7	8
School C	1	2	8	10	11
School D		5	11	6	10
TOTAL	**6**	**12**	**28**	**33**	**41**

11. Using a computer allows me to work at my own pace.					
School A		2	5	7	16
School B		2	1	12	11
School C	1	4	3	8	16
School D	3	6	7	8	8
TOTAL	**4**	**14**	**16**	**35**	**51**

Missing data:
School A: Qu. 7 = 1
School D: Qu.8 = 1

SECTION 3

CLASSROOM ENVIRONMENT	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
12. I'm encouraged to solve any problems that come up when I'm using the computer					
School A		2	4	9	15
School B		2	7	9	8
School C	1	6	5	14	5
School D	2	5	8	8	9
TOTAL	**3**	**15**	**24**	**40**	**37**
13. I am usually confused about what to do during computer time.					
School A	13	8	1	4	4
School B	11	10	4	1	
School C	15	9	3	1	4
School D	11	11	3	5	2
TOTAL	**50**	**38**	**11**	**11**	**6**
14. I am not happy with what is done when we use computers.					
School A	21	6	3		
School B	13	9		4	
School C	10	8	11	3	
School D	10	12	7	1	2
TOTAL	**54**	**35**	**21**	**8**	**2**
15. My teacher is always able to help me on the computer.					
School A	2		1	4	23
School B		3	2	10	11
School C		3	1	10	18
School D	2	6	2	12	10
TOTAL	**4**	**12**	**6**	**36**	**62**

Missing data:
School C: Qu. 12 = 1

SECTION 4

USABILITY

16. How much time do you spend on the computer at school during lessons, per week?

One hour/less than one hour Between 2 and 4 hours More than 4 hours

	1 hr/less than 1 hr	Between 2 & 4 hrs	More than 4 hrs
School A	13	14	1
School B	21	5	
School C	19	12	1
School D	25	5	2
TOTAL	**78**	**36**	**4**

Missing data:
School A = 2

17. Who do you usually use a computer with when you're at school?

a) friends in class b) other children c) teachers d) on your own e) other grown-ups

	Friends in class	Other children	Teachers	On your own	Other grown-ups
School A	13	6	7	10	1
School B	11	6	15	15	1
School C	16	5	6	21	
School D	25	4	7	19	2
TOTAL	**65**	**21**	**35**	**65**	**4**

18. What type of things do you do on the computer at school?
(Tick the appropriate options)

a) Play games b) Draw pictures c) Typing
d) Send/receive emails e) Use the Internet f) Use educational CD-ROM's
g) Watch films/DVD's h) School Projects i) Don't know
j) Other (specify) _____

	18a	18b	18c	18d	18e	18f	18g	18h	18i	18j
School A	26	15	25	11	12	16	4	26		3
School B	22	7	22	18	26	10	1	24		2
School C	30	7	26	21	30	7	1	29		1
School D	24	7	28	18	31	3		26		5
TOTAL	**102**	**36**	**101**	**68**	**99**	**36**	**6**	**105**	**0**	**11**

Missing data:
School D: Qu. 18a = 1; Qu. 18b = 1; Qu. 18c = 1; Qu. 18d = 1; Qu. 18e = 1; Qu. 18f = 1; Qu. 18g =1; Qu. 18h = 1; Qu. 18i = 1; Qu. 18j = 1

19. What do you like doing best on the computer at school?
(Tick the appropriate options)

a) Playing games b) Drawing pictures c) Typing
d) Sending/receiving emails e) Using the Internet f) Using educational CD-ROMs
g) Watching films/DVD's h) School Projects i) Don't know
j) Other (specify) _____

	19a	19b	19c	19d	19e	19f	19g	19h	19i	19j
School A	24	11	15	12	15	6	6	13	1	
School B	22	3	7	16	22	3	2	7		3
School C	28	2	6	16	13	1	3	5	1	1
School D	32	10	7	18	28		5	9		3
TOTAL	**106**	**26**	**35**	**62**	**78**	**10**	**16**	**34**	**2**	**7**

Missing data:
SCHOOL C: Qu. 19a = 1; Qu. 19b = 1; Qu. 19c = 1; Qu. 19d = 1; Qu. 19e = 1; Qu. 19f = 1; Qu. 19g = 1; Qu. 19h = 1; Qu. 19i = 1; Qu. 19j = 1

20. Why do you like doing these things on the computer?

Categories formed from Qualitative data:

a. Entertaining (Fun; enjoyable; exciting; interesting)
b. Not difficult (simpler, easy)
c. Efficient (Quicker; faster; more organised).
d. Relaxing
e. Education (helps with schoolwork; learning)
f. Other

	20a	20b	20c	20d	20e	20f
School A	18	2	3	1	3	5
School B	15	2	1	3	13	4
School C	26	5	3	1	9	2
School D	27	5	3	1	9	2
TOTAL	**86**	**14**	**10**	**6**	**34**	**13**

21. What is the worst thing about computers? Why?

Categories formed from Qualitative data:

a. Viruses
b. Computer malfunction (freezes, crashes)
c. Typing
d. Difficult (hard; confusing)
e. The age of the computer (too slow; loading)
f. Time (lessons too short)
g. Education (schoolwork)
h. Nothing
i. Teacher
j. Other

	21a	21b	21c	21d	21e	21f	21g	21h	21i	21j
School A		11	3	3	4	2	3	3		2
School B	1	2	8	1	2	1	1	7		3
School C	6	8	1	1	7		2	1		8
School D	1	4	5	2	5	3	7	2	4	3
TOTAL	**8**	**25**	**17**	**7**	**18**	**6**	**13**	**13**	**4**	**16**

22. What effect does the computer have on your schoolwork?
(Tick as many options as you want)

a) Saves time
b) Makes work easier
c) Makes work more enjoyable
d) Improves results/performance
e) Makes work less enjoyable
f) Takes more time
g) Other (specify) _____
h) No effect

	22a	22b	22c	22d	22e	22f	22g	22h
School A	22	23	23	16	2	2	4	
School B	19	22	18	19			1	2
School C	26	27	24	21			1	
School D	22	24	23	18		5		1
TOTAL	**89**	**96**	**88**	**74**	**2**	**7**	**6**	**3**

23. Tick one of each pair.
To me using the computer to complete different activities in Grade 7 is:

a) unimportant	or	important
b) boring	or	interesting
c) difficult	or	easy
d) dull	or	exciting
e) means nothing	or	means a lot
f) not needed	or	needed

	IMPORTANT	INTERESTING	EASY	EXCITING	MEANS A LOT	NEEDED
School A	28	28	26	27	28	27
School B	25	22	21	20	24	24
School C	31	30	29	26	27	28
School D	24	26	19	24	23	27
TOTAL	**108**	**106**	**95**	**97**	**102**	**106**

Missing data:
School A: Qu. 23a = 1; Qu. 23b = 1; Qu. 23c = 3; Qu. 23d = 2; Qu. 23e = 2; Qu. 23f = 2
School C: Qu. 23b = 1; Qu. 23d = 1; Qu. 23e = 1; Qu. 23f = 1
School D: Qu. 23a = 1; Qu. 23b = 1; Qu. 23d = 1; Qu. 23e = 1; Qu. 23f = 1

Spoilt data:
School B: Qu. 23c = 1; Qu. 23d = 1; Qu. 23e = 2; Qu. 23f = 1
School D: Qu. 23a = 2; Qu. 23b = 1; Qu. 23c = 3; Qu. 23d = 3; Qu. 23e = 3; Qu. 23f = 2

24. What sort of things currently restrict you from using a computer more often at school? (Tick as many options as you want)

a) Lack of interest	b) Lack of time
c) Lack of skills	d) Quality of software
e) Age of software	f) Limited amount of computers
g) Share computers with other students	h) Quality of computer
i) Age of computer	j) Lack of access to Internet
k) Lack of email	l) Teacher
m) None of these	n) Other (specify) _____
o) Don't know	

	24a	24b	24c	24d	24e	24f	24g	24h	24i	24j	24k	24l	24m	24n	24o
School A	1	26	3	11	8	12	7	8	5	14	5	8	1	2	1
School B	1	17	4	6	3	6	8	4	4	5	3	4	1	1	2
School C	4	21	1	5	7	8	3	3	8	9	3	9	2	2	2
School D	8	20	9	5	6	5	5	7	3	9	1	4	3	2	1
TOTAL	**14**	**84**	**17**	**27**	**24**	**31**	**23**	**22**	**20**	**37**	**12**	**25**	**7**	**7**	**6**

Missing data:
School A: Qu. 24a = 2; Qu. 24b = 2; Qu. 24c = 2; Qu. 24d = 2; Qu. 24e = 2; Qu. 24f = 2; Qu. 24g = 2; Qu. 24h = 2; Qu. 24i = 2; Qu. 24j = 2; Qu. 24k = 2; Qu. 24l = 2; Qu. 24m = 2; Qu. 24n = 2; Qu. 24o = 2

School C: Qu. 24a = 1; Qu. 24b = 1; Qu. 24c = 1; Qu. 24d = 1; Qu. 24e = 1; Qu. 24f = 1; Qu. 24g = 1; Qu. 24h = 1; Qu. 24i = 1; Qu. 24j = 1; Qu. 24k = 1; Qu. 24l = 1; Qu. 24m = 1; Qu. 24n = 1; Qu. 24o = 1

25. Why do you think you use computers in Grade 7?

Categories formed from Qualitative data:

a. High School
b. Future (jobs, work)
c. Schoolwork (research; projects)
d. Learning
e. Skills
f. Efficiency (presentation of work)
g. Other

	25a	25b	25c	25d	25e	25f	25g
School A	4	12	1	5	1	4	3
School B	4	13	8	4	3	4	
School C	1	6	17	14	3	2	4
School D	5	20	3	3	11	8	1
TOTAL	**14**	**51**	**29**	**26**	**18**	**18**	**8**

Missing data:

School A: Qu. 25a = 2; Qu. 25b = 2; Qu. 25c = 2; Qu. 25d = 2; Qu. 25e = 2; Qu. 25f = 2; Qu. 25g = 2

APPENDIX N – Letter of Request to the Western Cape Education Department

201 Greenpark
St.Andrews Road
Rondebosch
CAPE TOWN
7700

22 January, 2003

Dear Dr. Wessels

Let me begin by introducing myself to you. My name is Susan Friederichs, I am currently enrolled at the University of Cape Town for the degree of Masters in Education (Curriculum). I have undertaken the degree through coursework and minor dissertation. During the academic year of 2002, I completed the coursework component and drew up a proposal for my intended minor dissertation, which has subsequently been approved by the University of Cape Town. The reason I am writing to you, is with regard to obtaining permission to undertake, my Masters in Education minor dissertation's, field research in four of the Western Cape Education Department's schools.

The purpose of my study is to explore how teachers and learners perceive of how and why computers are used in Grade Seven. The study focuses on the following research question: "What are teachers' and learners' perceptions, from four ex-Model C primary schools in Cape Town, on how and why computers are used in the Grade 7 classroom?"

As a qualified primary school teacher with a Bachelor of Primary Education (Rhodes) and a Bachelor of Education (Hons) degree, I am very interested in the area of computers in education. I regard computers as an important part of teaching and learning in the 21st century and wish to establish through my minor dissertation, just how teachers and learners perceive/view the uses of computers in education and more specifically their reasoning as to why they are used. I wish to focus my study on the following four ex-model C primary schools located in the Southern Suburbs of Cape Town, namely: School A, School B, School C & School D. These schools, I consider to be relevant choices, since computers form an integral part of their teaching and learning processes. Consequently I believe it will prove interesting and beneficial to understand just how the Grade 7 teachers and learners in the prospective schools view the uses of computers in education considering the importance placed on them. It is my hope that this study will afford a better understanding of the perceptions that the sample group of teachers and learners have towards how and why computers are used in education, which will hopefully benefit not only other teachers, but also the learners who will be learning in those classrooms.

I am very interested in undertaking my field research in the above mentioned schools, in the first half of the 2003 school year. I consequently would appreciate it if you would kindly consider my request to undertake my research in the proposed schools. A copy of my research proposal will be submitted to you along with my research instruments, I have

drawn up. Please, do not hesitate to contact me if you have any questions regarding the intended research.

Thank you for your consideration.

Sincerely,

Susan Friederichs
B. Prim Ed (Rhodes), B. Ed (Hons) (UCT)

APPENDIX O – Letter of Thanks to the Schools

201 Greenpark
St.Andrews Road
Rondebosch
CAPE TOWN
7700

....., 2003

SCHOOL ADDRESS
.....
.....
.....

To the Head, Computer Specialist Teacher and Grade 7 Learners of .....

I would like to thank you for your time and assistance in partaking in the research study, "Teachers' and Learners' perceptions, from four ex-Model C primary schools in Cape Town, on how and why computers are used in the Grade 7 classroom". The data collected will be of great benefit and importance for my Research Project. Your support and willingness is much appreciated,

Sincerely,

Susan Friederichs
B. Prim Ed (Rhodes), B. Ed (Hons) (UCT)