EDUCATORS' ACCESS, TRAINING AND USE OF COMPUTER-BASED TECHNOLOGY AT SELECTED PRIMARY SCHOOLS IN THE CAPE TOWN SUBURB OF ATHLONE, WESTERN CAPE.

by

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Declaration

I, the undersigned, hereby declare that EDUCATORS' ACCESS, TRAINING AND USE OF COMPUTER-BASED TECHNOLOGY AT SELECTED PRIMARY SCHOOLS IN THE CAPE TOWN SUBURB OF ATHLONE, WESTERN CAPE is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree and that all the sources I have used or quoted have been indicated and acknowledged by means of complete references.

Signature

15/05/2003

Date

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LIST OF ACRONYMS AND ABBREVIATIONS

CBD	Central Business District
CD-ROM	Compact Disc-Read Only Memory
CEM	Council of Education Ministers
DoE	Department of Education
GET	General Education and Training
ICT	Information Communication Technology
ISAD	Information Society and Development
ISDE	Information Society Developments in Education
ISTE	International Society for Technology in Education
IT	Information Technology
LCD	Liquid Crystal Display
NGFL	National Grid for Learning
OBE	Outcomes Based Education
SPSS	Statistical Package for the Social Sciences
UCT	University of Cape Town
USA	United States of America
UWC	University of the Western Cape
WCED	Western Cape Education Department

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SUMMARY

In current international literature there exists adequate information on computer-based technology's influence on educators and learners. In South African literature there is an absence of research that specifically focuses on primary school educators' access, training and use of computers and the Internet.

This research study determines designated primary school educators' use of computer technology for accomplishing teaching related tasks such as using the computer to create instructional material; administrative record keeping; to access information via CD-ROM and the Internet for best practice teaching, model lesson plans and e-mail communication. In addition, the research also investigates factors influencing designated primary schools' ability to become ICT ready and the purposes for which primary school educators use computer technology.

To determine the extent to which this is done, the research project examines computer and Internet access, training and usage among educators in the Cape Town suburb of Athlone at eight primary schools in four residential areas: Surrey Estate, Vanguard Estate, Welcome Estate and Heideveld.

In examining these issues the research focuses on international perspectives on Information Communication Technology (ICT) application in education and the rationale for using computers in education. To situate the study, a historical overview is provided of factors that influenced the adoption of the Technology learning area in the South African school curriculum, education policy deficits, training and infrastructural deficiencies at schools. The research also examines ICT competencies expected from educators and provide a description of the advantages involved in computer application software usage for the achievement of teaching related tasks.

In doing this, the research involved the administration of a questionnaire on educators' (permanent or contract) access to and their training and use of computers and the Internet to accomplish teaching related tasks. The response rate for the survey for the eight primary schools in the study area was 76.3%. In addition, the survey was supplemented with interviews with designated primary school principals, which provided the background of the schools and assisted in the interpretation of the survey results. The theory of planned behaviour (Ajzen, 1988) was used to conceptualise educators' access, training and use of computers and the Internet to accomplish teaching related tasks.

The research highlighted that the required level of ICT readiness is influenced by the socio-economic status of learners attending the schools and the resources available in and outside the school community. The research concluded that although the majority of designated primary school educators have access to computers, the absence of adequate training for educators in the field of computer and Internet software application, had a negative effect on educators' use of such technology at schools to the accomplishment of teaching related tasks.

The survey also highlighted the fact that the ability of educators to use computer resources is influenced by two external factors: namely adequate access to computer resources as well as adequate training in their use. To address these deficiencies requires proactive management skills from school principals as well as the presence of proactive National and Provincial ICT policy to facilitate and address the opportunities and needs emerging from local school contexts. Finally, conclusions and recommendations were made based on the findings of the research.

Chapter1

Introduction

1.1 Background

The multiple interactive potential of computer technology has become the choice for communicating ideas and accessing information in the information age. The hardware and software used are generally known as Information Communication Technology (ICT). Hamelink (1997) defines ICT as those technologies that enable the handling of information and facilitate different forms of communication. For the purpose of this study ICT refers to computer and Internet technology. The technology offers the potential to give depth and perspective to communicating ideas and accessing information.

The technology application allows for multiple interactive interactions by combining text, graphics, video and audio in comparison to the one dimension of the printed media (Pacciano, 1998: 101; Maurer & Davidson, 1998: 139). The business sector has made extensive use of the advantages offered by constantly improving ICT capabilities and the technological capabilities have reached a stage where it is now possible for educators in the education sector to exploit the advantages offered by ICT application.

The advantages of using computer technology for the accomplishment of teaching related tasks are numerous. This includes speed of work, using the Internet to access information, printing clear lesson plans and having a tool through which work can be filed. It can also be used to facilitate communication, to retrieve international information to be used in a classroom setting and broadly stated, to expand the range of educational outcomes for learners.

However, despite these manifold advantages uncertainty surrounds the extent to which educators in South Africa make use of computer technology to accomplish teaching related tasks. Among the reasons, the National School Register of Needs 2000 Survey (South Africa...DoE...National School..., 2001) indicates that several

schools lack infrastructure (rooms, telephone lines, electricity connections), physical resources (trained teachers proficient in computer use) and finance.

Furthermore, the National School Register of Needs 2000 Survey (South Africa...DoE...National School, 2001) indicates that 70% of schools in South Africa do not have or use computers or the Internet as a teaching or learning tool. Available data suggests that this low usage is also applicable to our study area. Data obtained from the Khanya project[1] identified five out of eighteen primary schools in the Athlone suburb of Cape Town, which has fully equipped computer laboratories, namely Athlone North primary, Cypress primary, Kewtown primary, Habibia primary and Vanguard primary (Taczalski, 2003). Despite this, some educators, however, have access to computer technology and use this for, amongst other, lesson-planning activities.

1.2 Problem statement

The Strategy for Information and Communication Technology in Education released by the National Department of Education in November 2001, acknowledged that improving educator technology proficiency is a challenge for the government that accompanies the introduction of Information Communication Technology (ICT) into schools.

The long-term objective of computer and Internet application in South African education is to use it as a teaching and learning tool in all subjects, given the technological potential to enhance the instruction of traditional subjects in the curriculum and to improve the academic achievement of learners. In pursuit of this goal the National Education Department adopted the Revised National Curriculum Statement for Grades R-9 (South Africa...DoE...Revised, 2002) that expects educators to be competent and to develop learners' skills in this new and emerging technology. To examine the extent to which this goal can be realised at a local level this study examines:

[1] The Khanya project is an initiative of the Western Cape Education Department to provide schools in the Western Cape of computer laboratories that conform to criteria such as poverty, good whole school management and performance.

- Prevailing conditions of educators' access, training and use of computers as well as the Internet at eight primary schools in the Cape Town suburb of Athlone in the Western Cape. These schools were located in four residential areas: Surrey Estate, Vanguard Estate, Welcome Estate and Heideveld[2].
- Strategies to improve educator application of ICT in classrooms.
- Factors influencing designated primary schools' ability to become ICT ready.
- Existing links between the designated eight primary school educators' computer and Internet access and training, and the extent to which such technologies are utilised for accomplishing teaching related tasks. These tasks include using the computer to create instructional materials such as worksheets and tests; for administrative record keeping such as progress reports and attendance registers; to access information via CD-ROM off-line and the Internet online for best practice teaching, model lesson plans, e-mail communication and web publishing.

In line with the last goal, this research is based on the assumption that when designated educators experience the benefits and confidence of using ICT to accomplish teaching related tasks, they will then be in a much better position to be trained to use the technology as a teaching and learning tool. It is assumed that this approach will also allow educators to act as authentic role models when using the technology as a teaching or learning tool with learners. In conclusion, the problem upon this study is to determine whether there is any link between the designated primary school educators' computer and Internet access and training, and the extent to which such technologies are utilised for accomplishing teaching related tasks.

1.3 Aims of the research

The aims of the research were to:

- examine Surrey Estate, Heideveld, Welcome Estate and Vanguard Estate primary school educators' access, training and use of computers as well as the Internet for the achievement of teaching related tasks;

[2]The findings and recommendations emanating from this research are applicable to the designated eight primary schools in the study area and should not be generalised to be applicable to all primary schools in the Athlone region or the Western Cape.

- identify some areas for development of computer and Internet access and training for Surrey Estate, Heideveld, Welcome Estate and Vanguard Estate primary school educators;
- investigate factors influencing Surrey Estate, Heideveld, Welcome Estate and Vanguard Estate primary schools' ability to become ICT ready.

1.4 Objectives of the research

The objectives of the research were specifically to examine the following.

The target population's access to:

- computers, printers, scanners and the Internet at home, school and in the community (See section three & five of the survey questionnaire).

The target population's level of computer skills, for example, none, little, basic or advanced in:

- word processing, spreadsheet, databases, CD-ROM, web publishing, e-mail communication and Internet search engines software application (See section two of the survey questionnaire).

The type of learning circumstances within which individuals from the target population have received:

- word processing, spreadsheet, databases, CD-ROM, web publishing, e-mail communication and Internet search engines software application training. These circumstances include college and university education, work experiences and/or self-education. The study also considers the frequency of learning interactions, for example, none, seldom and frequent (See section two of the survey questionnaire).

The purposes for which the target population use computers to realise teaching related tasks such as:

- creating instructional materials such as worksheets and tests; for administrative record keeping such as progress reports and attendance registers; to access information via CD-ROM offline and the Internet online for best practice teaching, model lesson plans, web publishing and e-mail communication as well

as the frequencies to which this is done for example, not at all, daily, weekly, monthly or twice a year (See section four of the survey questionnaire).

Factors experienced by Surrey Estate, Heideveld, Welcome Estate and Vanguard Estate primary schools as either inhibiting or promoting the adoption of ICT resources such as:

- the impact of the socio-economic condition of learners attending designated primary schools as well as the impact of school fees and fundraising activities on individual schools' ability to become ICT ready (See interview schedule).

1.5 Theoretical framework

The theory of planned behaviour (Ajzen, 1988) provides a useful prescriptive model to conceptualise the designated educators' access, training and use of computers and the Internet to accomplish teaching related tasks at selected primary schools in the study area. Fishbein & Ajzen's (1975: 16) theory of reasoned action asserts that actual behaviour follows from behavioural intention and that behavioural intention is formed by one's attitude towards behaviour and subjective norm. Foster & Nel in Foster & Louw- Potgieter (1995: 131) assert that beliefs constitute the cognitive processes, intentions constitute the conative processes and behaviour constitutes the outcome.

The theory of planned behaviour (Ajzen, 1988) is an extension of the theory of reasoned action (Fishbein & Ajzen, 1975), which accounts for conditions where individuals do not have complete control over their behaviour (perceived behavioural control). Both theories expand the pre-determinants of intentions into: the attitude towards the behaviour (theory of reasoned action and planned behaviour); the social pressure to perform the behaviour (theory of reasoned action and planned behaviour) and the perceived behavioural control (unique to the theory of planned behaviour) (cf: Fig 1). Ajzen (1988: 132) defines perceived behavioural control as the perceived ease or difficulty of performing a particular behaviour, reflecting on past experiences as well as anticipated impediments and obstacles.

Two important features of the theory of planned behaviour are that the theory, firstly, assumes that the perceived behavioural control has motivational implications for

intentions. For example, in this study educators employed at the eight primary schools may have favourable attitudes towards adopting computer and Internet applications in accomplishing teaching related tasks, but due to for example lack of access to the technology and/or lack of training opportunities are unlikely to form strong behavioural intention to engage in it.

The second feature is the possibility of a direct link between perceived behavioural control and behaviour; in other words, the performance of behaviour depends not only on motivation to do so but also on adequate control over the behaviour in question. Perceived behavioural control can thus influence behaviour indirectly, via intentions, and can also be used to predict behaviour directly (Ajzen, 1988: 134).

In this study perceived behavioural control refers to the extent to which educators at the eight primary schools have confidence in their ability to use computers and the Internet in accomplishing teaching related tasks. Educators' use is influenced by two external factors, namely access and training. Access is influenced by factors such as place/s of access, either at home, school, friend's house or other place/s (See section three & five of the survey questionnaire).

Training on the other hand is influenced by factors such as type of application software training received, such as word processing, spreadsheet, database, e-mail, Internet search engines, web publishing or other application software training; place/s where application software training was received such as public, private, self, work experience, friend's or other place/s and frequency of application software training received (See section two of the survey questionnaire).

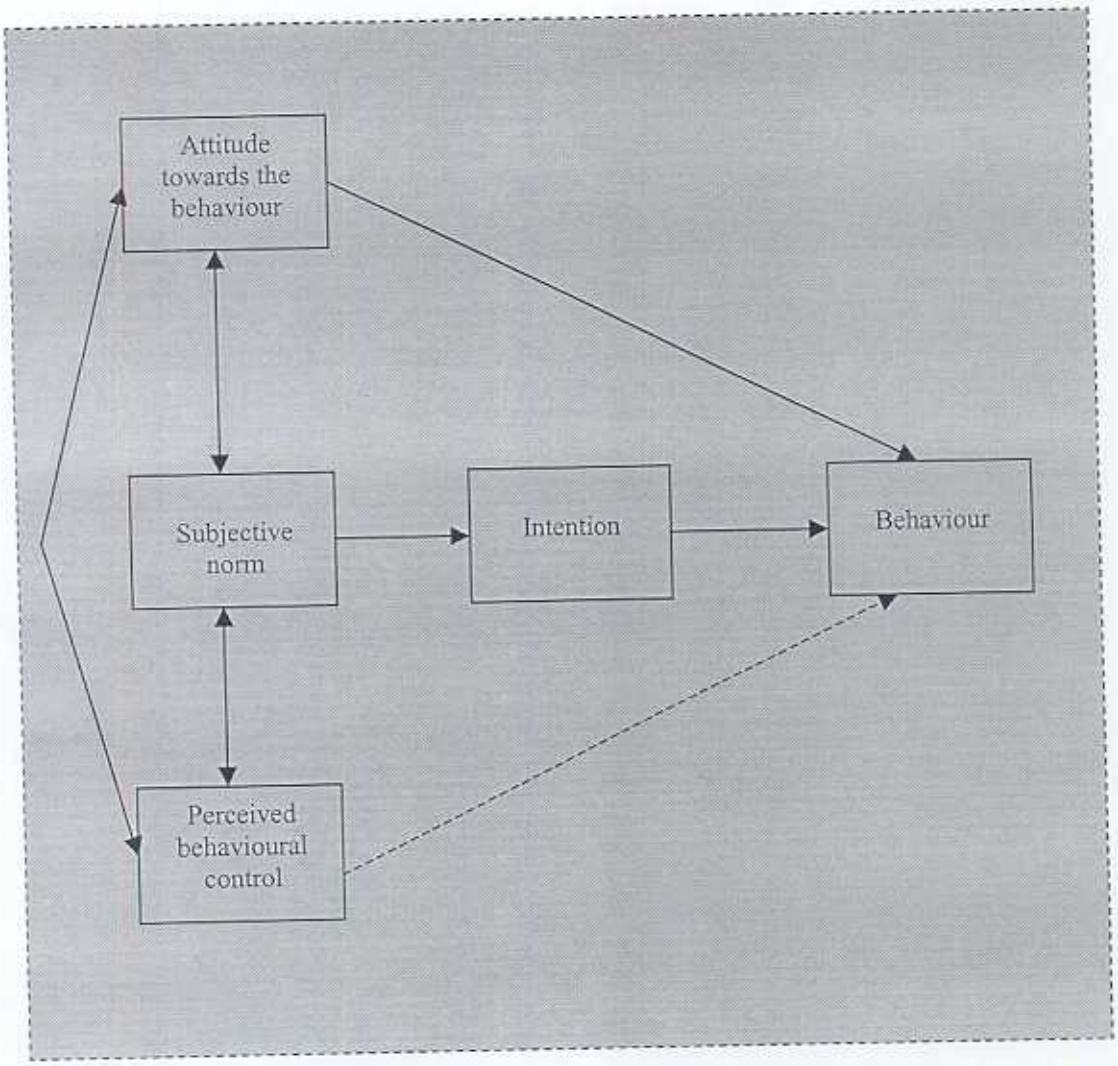

Figure 1 The theory of planned behaviour (Ajzen, 1988: 133)

Type, place and frequency of application software training have an impact on the designated educators' computer and Internet software skills (internal factor) and consequently influence educators' confidence (internal factor) in their ability (internal factor) to use the computer and the Internet in accomplishing teaching related tasks at selected primary schools. There are many causal factors underlying educators' use of computer technology and Ajzen's theory of planned behaviour provides a theoretical paradigm, which can be successfully applied to identify causal relationships between variables.

1.6 Limitations of the study

The results are not necessarily applicable to other populations. While schools in Athlone are varied with regard to the composition of its learners and educators and exemplify features associated with both working class and middle class neighbourhood, the study targets a subset of schools, educators and learners within this community, and while their characteristics are generally applicable to schools in other former coloured areas, the characteristics are generally not wholly applicable to other residential areas.

1.7 Significance of the study

The information gathered from this study should reflect the current state of Surrey Estate, Heideveld, Vanguard Estate and Welcome Estate primary school educators' access and training, which influence the use of computer-based technology for the achievement of teaching related tasks. The information gained from this study could be utilised to develop guidelines for the types of access and training, which are most successful in influencing the designated educators' use of computer-based technology for the attainment of teaching related tasks.

1.8 Exposition of chapters

Chapter one provides a description of the background, problem statement, aims, objectives, theoretical framework, limitations and significance of the study as well as the exposition of chapters.

Chapter two focuses on international perspectives on Information Communication Technology (ICT) application in education and the rationale for using computers in education. To situate the study, a historical overview is provided of factors that influenced the adoption of the Technology learning area in the South African school curriculum, education policy deficits, training and infrastructural deficiencies at schools. The chapter ends with a discussion of the advantages of using computer application software, such as word processing, spreadsheet, databases, CD-ROM and telecommunication (Internet) software for the accomplishment of teaching related tasks.

The research design and methodology are discussed in Chapter three. This chapter includes a description of the study area, methods utilised to obtain information from respondents, data collection and proposed data analysis.

The presentation and interpretation of data are discussed in Chapter four. This chapter includes the results of the study in Surrey Estate, Vanguard Estate, Welcome Estate and Heideveld. The data collected from the questionnaire are provided in the form of nominal data. The data were gathered, coded and captured using Statistical Package for the Social Sciences (SPSS) software in order to ascertain frequencies and general trends in responses. The descriptive data are reported in frequencies and percentages and the comparison is generated in tabular form. Information elicited from interviews with principals was analysed and used to assist in the interpretation of the survey.

Conclusions and recommendations are discussed in Chapter five. In this chapter, the results of the findings are interpreted in terms of the literature review and background of designated primary schools. The chapter concludes with recommendations for further research.

Chapter 2

Literature Review

2.1 The link between Education and Information Communication Technology (ICT)

2.1.1 Introduction

Lundall & Howell (2000: 23) state that the growth of ICT in education is a global phenomenon, which emphasises education as a basic way for ICT to produce competent learners, suitably qualified and skilled to contribute to economic growth. La Velle & Nichol (2000: 99) identify five factors influencing the adoption and assimilation of ICT into the educational arena; namely: ICT's relative economy, effectiveness, efficiency, speed of access to data and the pleasure it provides compared to non ICT provision. ICT's relative efficiency and effectiveness are dependent on educators' and learners' ICT skills in reaching subject objectives. ICT speed of access is dependent on the availability of electricity, reliable telecommunication infrastructure and hardware and software configurations.

The link between education and economic growth places greater focus on national governments to increase levels and quality of education. Alexander (1999: 7) identifies the following countries that have adopted ambitious national plans to open access to computers and the Internet to all school students. These are the Technology Literacy Challenge in the United States of America, the National Grid for Learning (NGFL) in the United Kingdom, Schulen am Netz in Germany, and Educnet in France. There are two perspectives that currently dominate the debate on how countries should respond to the utilisation of ICT; namely the positive and negative perspective.

2.1.2 Positive approach towards ICT

The positive perspective sees ICT as a liberating tool, with potential benefits (Capper, 2001; Fontaine, 2001; Fulton, 2001; Haddad & Jurich, 2001; Kenny, 2001; Wagner, 2001) and is most prominent in the economic sphere. Jurich (2000: 43) argues that

knowledge rather than labour is the key element for sustainable development in this global economy.

Mc Namara (2000: 9) supports Jurich's argument by stating that access to and effective use of information and knowledge will be the critical determinant of successful and sustainable development for individuals, communities and nations as we enter the 21st century. Mayor (1999: 7) identifies education as one of the main forces for shaping tomorrow's world, it can define technology's uses in such a way as to reinforce creativity, empowerment and equality and should be seized on as an opportunity for making the new technologies work with and for education.

In adding an essential dimension to this perspective, Haddad (2000: 5) emphasises that technology is only a tool and that educational choices have to be made in terms of objectives, methodologies and roles of educators and learners before decisions on the appropriate technology can be made.

2.1.3 Negative approach towards ICT

The negative perspective points out the inequities that are engendered by ICT and the fear that the gap between the information rich and information poor will grow (Boston Globe, 2001). For Jurich (2000: 42) the digital divide exists not only between nations, but also between individual countries, regions (urban and rural) as well as race and ethnicity. D' Amico (2001) and Jurich (2000) postulate that only at the top income levels do the racial differences disappear. In South Africa the use of computers as a teaching and learning tool are predominantly confined to independent and former model C schools that have the financial means to invest, equip and sustain ICT acquisition and resources and in educators development (Van der Merwe, 2001: 9). Financial means of parents rather than race distinguished the type of learners that attend such schools.

However, former model C schools are historically advantage public sector schools that use school fees to maintain themselves as an elite grouping of public sector schools in South Africa. These schools also conduct assessments of parent's ability to pay school fees before a child is admitted to the school. The majority of parents that can be classified as poor in South Africa are predominantly black and lack the

financial means to send their children to model C schools (Ramadiro & Vally, 2002: 19).

Reid (2001) defines the digital divide as a matter of income that can be correlated with race and ethnicity. According to Reid (2001) African-American, Hispanic and American Indian students, who predominantly come from the lower income group, tend to have less access to and sophisticated use of computers and the Internet than their white classmates. This suggests that race and ethnicity matter when it comes to the technology gap, and that closing the digital divide is more complex than providing all students with computers. Sipior, Ward & Marzec (2001) identified income, age, education, race, household type and geographical location as the most important factors separating the 'haves'; and the 'have nots' (digital divide) in the United States of America.

2.1.4 Validity of the positive and negative approach

Hamelink as cited in Lundall & Howell (2000: 24), points out that the type of ICT policy adopted by individual countries will give rise to either the optimistic (positive) or pessimistic (negative) perspective. According to Hamelink countries that adopt proactive ICT policies that are aligned with the individual country's developmental agenda will be able to transcend the simple optimistic/pessimistic dichotomy. In terms of ICT policies applicable to the education sector, Hawkridge *et al.* (1990: 27), offers four rationales for the use of computers in schools, namely social, vocational, pedagogic and catalytic.

2.1.4.1 Social rationale

The social rationale, which is the most common in schools, asserts the importance of computers in modern society. According to Hawkridge *et al.* (1990: 27), learners usually learn the principles on which computers work, but gain little hands-on experience and usually face no examination of their achievement. Emphasis is on computer awareness. He further argues that using computers in schools only for social awareness is a waste of time and resources as the inherent potential of computers as an educational tool is not realised. Bitter & Camuse (1988: 19) define computer awareness as the development of recognition of computers and their uses in society and a relative degree of comfort in working with computers.

2.1.4.2 Vocational rationale

The vocational rationale according to Hawkridge *et al.* (1990: 27) asserts that learners should learn to control, operate and use application programmes that will provide them with skills vital for employment in the information technology society. Emphasis is on computer literacy or even computer science and often aimed at preparing learners for an examination.

Geisert & Futrell (2000: 8) describe computer science taught at school level, as an introduction to the concepts taught at tertiary computer science departments. The secondary school level computer science curriculum focuses on computing concepts, computer programming and computer operations and aim at preparing learners for further post school studies in computer science in order to graduate as a computer professional, or preparing learners for a computer related vocational field.

A distinction should be made at school level between skills and concepts applicable to computer science specialisation and those that all learners should receive. Geisert & Futrell (2000: 8) further state that there is no consensus about what it means to be computer literate. This is because of the evolving nature of technology, especially the advent of telecommunication technology and the Internet, which has created new needed competencies that were not present at the beginning of the decade. Geisert & Futrell (2000: 8) define a computer literate individual as a person who knows a bit about computers, but not as much as a computer professional.

2.1.4.3 Pedagogical rationale

The pedagogical rationale according to Hawkridge *et al.* (1990: 27) asserts that computers can improve the teaching and learning process and enhance the instruction of traditional subjects in the curriculum.

Geisert & Futrell (2000: 9) argue that computers should be integrated into the content domains and that learners should learn to apply computers in a meaningful way in the different subject areas, to facilitate coherence and conceptual understanding of the necessary computer skills and the accompanying computer application software. According to Geisert & Futrell teaching computer skills in isolation, for example, in

separate computer classes, without integrating it into the content domain is not beneficial or to the advantage of learners.

The Australian Computer Society and the Council for Computers in Education as cited in Byron & Gagliardi (1998) have identified five basic ways or modes (support, exploration and control, tutorial, resource and link mode) of using computers in teaching and learning. Application software can be applicable in more than one mode, depending on the objective of the application software use. The Panel on Educational Technology of the President's Committee of Advisors on Science and Technology as cited in Becker & Ravitz (1999: 356) states that the student centred constructivist paradigm offers the most fertile ground for the application of technology in education.

Jonassen *et al.* (n.d.) identified the following types of learning and matched them with appropriate corresponding learning theory approaches. These are introductory learning–behaviourist and cognitive approach and advanced and expert knowledge acquisition–constructivist approach.

Jonassen *et al.* (n.d.) further postulate that the use of computer application software in learning can basically be divided into two categories that correspond and complement different approaches to learning. The behavioural and cognitive approach would best facilitate introductory learning and would include, for example, computer application software such as drill and practice and tutorials, which focus on reactive interactivity. This approach is based on the assumption that learners in this stage have very little transferable prior knowledge about a skill or content area. Content learning in this stage is predetermined, sequential and criterion referenced and provides a basis for advanced and expert knowledge acquisition.

The constructivist approach, which focuses on proactive interactivity, would best facilitate advanced and expert knowledge acquisition. It includes, for example, computer application software such as e-mail for asynchronous communication, desktop interactive video conferencing for synchronous communication, hypertext and hypermedia simulations, tutorials, CD-ROM and the World Wide Web (Internet), allowing learners to articulate their knowledge constructions (Geisert & Futrell, 2000; Maurer & Davidson, 1998; Morrison, Lowther & De Meulle, 1999; Pacciano, 1998).

In South Africa the Draft Revised National Curriculum Statement for Grades R-9 (South Africa...DoE...Draft, 2001) contained elements of both a behaviourist and constructivist approach. Words used that reflect a constructivist approach included the following:

- *Learners adapt to an ever-changing environment, recognising that human understanding is constantly challenged and hence changes and grows* (South Africa...DoE...Draft, 2001: 13).

Words used in the Revised National Curriculum Statement for Grades R-9 (South Africa...DoE...Revised, 2002) that reflect a behaviourist approach included the following:

- *A learning outcome is a description of what (knowledge, information, skills, attitudes and values) learners should know and be able to do at the end of the General Education and Training Band* (South Africa...DoE...Revised, 2002: 14).

The Review of Curriculum 2005 states it as follows:

- *Outcomes by grade should specify the sequence of the core concepts, content and skills to be taught in each learning program at each grade level. Assessment standards should provide assessment exemplars which detail what kind of tasks can be set, what assessment strategies should be adopted and the kind of answers that can be expected* (South Africa...DoE...A South African Report, 2000).

2.1.4.4 Catalytic rationale

The catalytic rationale, according to Hawkridge *et al.* (1990: 27), sees the introduction of computers as improving the overall performance and efficiency of schools (teaching, learning and management). Computers are seen, as catalysts enabling desired change in education to occur. Emphasis on teaching and learning is to discourage memorisation and individualisation in favour of information handling, problem-solving and collaboration.

2.1.5 Conclusion

South Africa, as a developing country, is still in its infant stage in the adoption and implementation of ICT resources into the school environment. Byron & Gagliardi (1998) state that ministries of education and other actors in the policy making process will base decisions to introduce ICT (computer technology) into the education sector on one or more of these rationales (social, vocational, pedagogical or catalytic), which may overlap in some respects.

Duguet as cited in Byron & Gagliardi (1998), states that restricted policies are designed around the social and vocational rationales, while comprehensive policies engaged issues of pedagogy and that most developed countries are moving in the direction of comprehensive policies, while developing countries are still largely concerned with restrictive policies. Lundall & Howell (2000: 27) postulate that many developing countries aim to include comprehensive features in their policies, based upon developed countries' experiences, successes and failures of ICT use and application and on their own experiences of development.

2.2 Historical overview of factors that influenced the adoption of the Technology learning area in the South African school curriculum

2.2.1 Introduction

In 1997 the Minister of Education (Bengu, 1997) approved technology as one of eight learning areas for the new curriculum. The introduction of this new curriculum, known as Curriculum 2005 was problematic and caused an outcry from educators and academics (See Jansen & Cristie, 1999; Mda & Mothata, 2000; Sayed & Jansen, 2001). In February 2000 the Department of Education appointed a review team chaired by Professor Linda Chisholm to conduct an investigation into and provide recommendations on the effective implementation of outcomes-based curriculum (South Africa…DoE…Appointment…, 2000). The Report of the Review Committee was presented to the Minister of Education in May 2000 and proposed the rationalisation of the Technology learning area for the following reasons:

- *Overload of the curriculum in the General Education and Training (GET) band;*

- *The vast majority of South African schools that offer the General Education and Training (GET) band do not have teachers who have any education or training in Technology;*
- *There is also a dearth of equipment and learning support materials in this learning area;*
- *It is not possible to include exit requirements for this learning area in the General Education and Training Certificate* (South Africa...DoE...A South African...: Report..., 2000).

However, aspects of the learning area that relate to the development of skills and knowledge necessary for the 21st century should be encouraged and introduced when educators are trained and resources become available. The review committee recommended that technology (as applied science) is introduced in the learning area of Natural Science and that 'design' features of technology and its use are included in the Life Orientation learning area. The review committee acknowledged that there was a division of opinion as to whether technology should be included in science or whether it should be presented as a separate learning area. The reason for this division of opinion was that there is no consensus on what the study of technology should encompass.

2.2.2 The Draft Revised National Curriculum Statement for Grades R-9

In June 2000 the Council of Education Ministers (CEM) responded to the Report of the Review Committee on Curriculum 2005 with regard to the Technology learning area as follows:

- *Despite the curriculum overload and the fact that teachers for the area of Technology are not available, the CEM cannot support the proposal to drop this learning area, due to the importance of this subject in a 21-st century economy;*
- *Extensive mobilization of resources will be undertaken to support teachers in this learning area* (South Africa...DoE...Response by Professor Kader Asmal, 2000).

In July 2000 the Cabinet endorsed the decision of the CEM with the Technology learning area being retained and proposed the development of a National Curriculum

Statement (South Africa...DoE...Council, 2000). The Draft Revised National Curriculum Statement released for public comment in July 2001 included ICT as one of three strands used to organise content in the Technology learning area.

Expected skills to be developed in the ICT strand included the following:

- **Word processing** (skill needed by all learning areas);
- **Spread sheets** (skill needed mostly by Mathematics and Economic and Management Sciences);
- **Database** (skill needed mostly by Social Sciences, and Economic and Management Sciences);
- **Graphics** (skill needed mostly by Arts and Culture, Technology and Social Sciences);
- **CD-ROM** referencing (needed by all learning areas);
- **Internet** (needed by all learning areas);
- **E-mail**, chat forums and the development of mailing lists (needed by all learning areas) (South Africa...DoE...Draft, 2001: 74).

It is envisaged under the ICT strand that all educators should be competent in ICT application in their learning areas in order to develop and maximise learners' skills in ICT application, and to use ICT as a tool to improve learners' academic achievement. This aspect of ICT can only be realised if educators are trained and prepared in ICT use and application as well as an understanding of the pedagogical implications using this technology for teaching and learning, and can only be offered to learners where schools have the necessary resources and equipment.

2.2.3 Conclusion

The approach to ICT is one that aims at the optimal use of learning support materials and equipment to access, process and use information. The Draft Revised National Curriculum Statement for Grades R-9 proposed that educators should subscribe to the notion of lifelong learning and assume a measure of responsibility for their own development and for the implementation of the curriculum. The Revised National Curriculum Statement Grades R-9 replaced the Statement of the National Curriculum for Grades R-9 approved in 1997.

At the Information Society Developments in Education (ISDE) 2002 Conference in Potchefstroom (South Africa....DoE...Closing address, 2002), the Minister of Education in his closing address, highlighted the Education Department's vision that all learners, at the end of their Foundation Phase, will use computers in the acquisition and enhancement of their numeracy and language skills. It is envisaged that learners and educators will have basic competence in the use of word processing, spreadsheet, flat database, e-mail, and web browser applications and that educational software will be compatible with Curriculum 2005 assessment standards. This vision will be guided by the Strategy for Information and Communication in Education. The Department of Education envisaged introducing the Revised National Curriculum Statement Grades R-9 in the Foundation Phase in 2004.

The Minister of Education's vision that all learners will use computers at the end of their Foundation Phase is questionable. This is especially within the short and medium term if one considers the claims made by the Department of Education that it does not have the financial means to equip all public schools in South Africa with ICT resources. The criteria proposed in the Strategy for Information and Communication in Education exclude schools from receiving ICT resources that do not conform to certain criteria.

2.3 Constraining factors hampering the introduction of ICT resources into the school environment

2.3.1 Introduction

The Education Policy Unit at the University of the Western Cape conducted the first in-depth analysis of the extent and ways in which computers are being used in South African schools. The research highlighted a very important aspect of Information Communication Technology that needs further investigation, which relates to building human resources for ICT capability. The research investigation identified infrastructural deficiencies, educational policy deficits and training deficits as major inhibiting factors experienced by South African schools in the adoption of ICT resources.

2.3.2 Infrastructural deficiencies

Major inhibiting factors to the adoption and start-up of ICT usage in South African schools are the inequalities and appalling conditions within which some schools are operating. The National School Register of Needs 2000 Survey (South Africa...DoE...National School, 2001) indicated the following deficits for the year 2000:

- *Classroom shortages decreased from 49% (1996) to 40% (2000);*
  Schools' access to water decreased from 40% (1996) to 34% (2000);
  There was an improvement of 68% (2000) in the provision of sanitation, although 16.6 % of learners continue to be without toilet facilities;
  Fifty-nine percent (59%) of schools had no telephones in 1996, reduced to 34% in 2000;
  There was a decrease from 9000 to 4000 schools in excellent and good condition, with at least 12 000 buildings in need of repair;
  Seventy percent (70%) of schools are still without computers (South Africa...DoE...National School, 2001).

2.3.3 Educational policy deficits

Another concern is the lack of clear curriculum guidelines for the teaching of computer skills into the teaching and learning process, indicated by the following concerns expressed by educators as cited in Lundall & Howell (2000):

- *'It is imperative that computers are taught within an integrated fashion and that set guidelines be provided. This will go a long way in allowing learners to appreciate computers as a tool. Although we use the resource extensively to improve student skills we don't really know what to emphasise'* (Lundall & Howell, 2000: 153).

- *'The lack of guidance from provincial education departments limits initiative and acceptance by both teachers and parents'* (Lundall & Howell, 2000: 154).

- *'We need clarity on the Department of Education's position on computer issues. The absence of clear guidelines makes it extremely difficult to plan and to know*

whether we are teaching learners appropriate computer skills' (Lundall & Howell, 2000: 154).

2.3.4 Training deficits

The South-African government's perspective on the information society and the developing world (Information..., 1996) acknowledged that the root problem in primary and secondary schools is the lack of strategic vision for information skills and competencies in school syllabi. This problem is further compounded within the school system by a lack of exposure of educators to Information Technology (IT). The government acknowledged that unless IT is a required subject on the teacher-training curriculum, this problem would remain with a resultant negative effect on human resource development in general.

Recommendations made at the Information Society and Development (ISAD) Conference in Midrand, 1996 included:

- *Teachers have to be trained in the use of IT both as an administrative tool and a delivery method for classes, as well as in specific IT skills from introductory to advanced levels;*
- *Information Technology should therefore form part of teacher training curricula and in-service training for teachers in applications of IT* (Information..., 1996).

The survey conducted on computers in South African schools in 1998 estimated that 13% of South African schools had computers (Lundall & Howell, 2000: 8). Based on a sample data collected from the 13% (3 670 out of 27 188) of schools in South Africa that have one or more computer(s), identified the lack of available staff trained in the use of computers as the biggest hindering condition to the effective use of computers.

Smeets & Mooij (2001: 404) identify educators' competence in ICT skills as a crucial factor when introducing ICT in education. To achieve this objective the British government provided subsidies to classroom educators to buy their own computers accompanied with educator training in their application in education (Selwyn & Bullon, 2000: 321).

A government initiative in England in helping educators to gain access to a personal computer, includes a scheme whereby educators who sign up for the New Opportunities Fund ICT training are eligible for a subsidy of 50% towards the cost of a personal computer, up to a maximum of five hundred pounds. A follow-up study on participating educators revealed that the scheme had made a significant impact on participating educators' confidence and competence with ICT and, in turn, on their pupils, which reflects the general impact of increasing levels of equipment and training (Becta, 2001).

This raises a very important question of educators' competencies in preparing South African learners for the information age. Only through investment in educators as highlighted by the developed countries, will investment in technology be realised (USA Congress, Office of Technology Assessment, 1995). Both in-service as well as pre-service educators deserve the best in policies and preparations. Although it is imperative for the Department of Education to address the inequalities and appalling conditions that exist in the majority of schools in South Africa, it should not be at the expense and neglect of those state schools that show readiness for ICT usage and applications. The following statement of a principal at a state school cited in Lundall & Howell (2000: 151) highlighted the above issue.

- *'One problem at our school is that very few people know anything about computers; we depend on one teacher who doesn't have much time to assist children ...if our teachers knew more about computers we could use them more efficiently. This is the fault of an education department that has done little to promote staff development ... Teacher training is a major issue – none of our teachers are qualified to teach computer skills'* (Lundall & Howell, 2000: 151).

2.3.5 Conclusion

In South Africa the computer competencies of educators is not yet a compulsory requirement of educators' professional qualification and education authorities should urgently review this policy. The framework for technology standards applicable to education settings as proposed by the International Society for Technology in Education (ISTE), should be considered, evaluated and adapted to South African developmental needs and implemented by Faculties of Education as a vital component

of their curriculum as to empower prospective educators with the skills necessary to prepare South African learners for the global economy in the information age.

Educators currently employed at schools are also in need of this type of training that will empower them with the necessary skills to prepare South African learners for the 21st century economy. The National Department of Education acknowledged that educator training in this new and emerging technology presents a massive challenge to the government, especially educator technology proficiency that needs to accompany the introduction of ICT resources into the school environment.

The National Department of Education claims it does not have the financial means to equip all South African public schools with computer laboratories. Decisions on which to equip schools with computer laboratories is the responsibility of Provincial Education Departments. The decision will be influenced by a number of factors such as location, availability of space and management capabilities (South Africa...DoE...Strategy, 2001: 23).

Current initiatives include the Khanya project in the Western Cape and the Blue IQ project in Gauteng. The Gauteng Education Department in collaboration with the private sector, intends to install computer laboratories consisting of 25 workstations in all Gauteng public schools by the end of 2006. The Western Cape Education Department envisaged reaching this target by the end of 2012. The Gauteng Provincial Cabinet has made 500 million rand available for the next four years as part of their Blue IQ project. The Western Cape Provincial Cabinet, on the other hand, has made 40 million rand available as part of their Khanya project for the first phase of this role out model for the year 2002 (South Africa...DoE...Strategy, 2001: 15).

Examples of management criteria used by the Khanya project to classify schools as ICT ready and provided with computer laboratories include individual schools' ability to attract private sponsorship, fundraising ability, provision of effective security etc. In addition individual schools need to provide the Khanya project of a business plan of how they intend to sustain ICT resources. An average numerical value is assigned to individual schools based on these criteria that determine whether a school is ICT ready or not (Bloomfield, 2002).

The Khanya project envisaged to spend 72 million rand by the end of March 2003 on computer installation in 55 primary, 78 high, 5 special and 17 combined and intermediary schools. The Faculty of Education at the University of Cape Town (UCT) is currently investigating the feasibility, efficiency and effectiveness of the Khanya project in terms of educators' competent training in using computers and computer installations (Van der Merwe, 2002b: 5).

2.4 Computer application software that educators could utilise for accomplishing teaching related tasks

2.4.1 Introduction

Current microcomputers are user-friendly due to changes and improvement in computer hardware and software. The computer has the potential to help educators become more efficient and effective and to enhance their quality of teaching (Geisert & Futrell, 2000: 11; Maurer & Davidson, 1998: 57). Computer application software that educators can use includes word processing, spreadsheet, database, graphics and telecommunication.

2.4.2 Word processor

Word-processed documents have become the standard for formal written communication in the information age and should be used by all educators to enhance their professionalism (Maurer & Davidson, 1998: 81). According to Pacciano (1998: 69) word processing is the most frequently used microcomputer application in the world. Geisert & Futrell (2000: 39) state that the most fruitful use of the word processor for educators is in the preparation of instructional materials and can be used across all subjects in the curriculum.

2.4.3 Spreadsheet

After word processing, the electronic spreadsheet has become the most frequently used microcomputer software (Pacciano, 1998: 65). Educators can use the spreadsheet to create electronic grade books to track, log, update, record, maintain and calculate learners' grades on class projects, attendance, daily participation, tests and other assignments (Morrison, Lowther & De Meulle, 1999: 154; Erickson & Vonk, 1994: 109). It can also be used to generate descriptive graphs and text to accompany

numbers. Additional features are that educators can explore numbers and formulas and run statistical analysis on data to determine similarities and differences (Geisert & Futrell, 2000: 46).

2.4.4 Databases

Databases are used to store and access information in an easy and rapid manner (Erickson & Vonk, 1994: 142). Educators can create a database file by using a single file to store a variety of information of his/her students. The file can be arranged with each student as one separate record. Examples of fields that educators can use for every student include student name, surname, address, telephone number and grade level. The advantage of the database file is that a file, record or field can be changed with ease and is designed to solve the problem of storing, organising and accessing information. Additional database files that an educator can have on his/her hard drive include commercial sources of learning materials, encyclopaedic information and questions and answers related to the topic taught (Geisert & Futrell, 2000: 48).

2.4.5 Graphics

With graphic software educators can enhance instructional material by including graphics, illustrations, geometric figures and other designs and combine it into a Word document to accompany texts.

2.4.6 Telecommunication

With telecommunication, educators can access a wide range of local and global resources online. It provides the means by which educators can collect, share, interact, and evaluate ideas and data with individuals or groups worldwide. Educators who have access to the World-Wide-Web on the Internet can access and download model lesson plans, best practice teaching and information relevant to curricular objectives from individuals or groups across the globe. With e–mail, educators can interact with educators, parents and experts anywhere in the world who have access to these facilities. Educators can send progress reports of students as an attachment via e-mail and receive feedback from individual parents that have access to this type of technology.

2.4.7 Conclusion

Current Works programme is the integration of a number of software and allows different software to be compatible with each other. For example, an educator can produce students progress report marks using a spreadsheet and print them into a progress letter using a word processor. The parents' names and surnames and those parents with e-mail addresses can be retrieved from the database and the educator can send the progress report as an attachment via e–mail to individual parents who have e–mail access. E–mail also allows educators to receive feedback from individual parents. The advantages of using computer technology to accomplish teaching related tasks are numerous, but are dependent on educators' access to the technology as well as accompanied computer application software training.

This research is based on the assumption that when educators at the designated eight primary schools in the Athlone suburb of Cape Town experience the benefits and confidence of using ICT to the attainment of teaching related tasks, they will be in a much better position to be trained to use the technology as a teaching and learning tool. When these designated schools obtain ICT equipment and resources for teaching and learning, it is assumed that educators who experience the benefits and confidence of using ICT in accomplishing teaching related tasks, will have a more positive attitude to be trained to use the technology as a teaching or learning tool. This approach will also allow educators to act as authentic role models when using the technology as a teaching or learning tool with learners.

Studies conducted by Cox, Preston & Cox (1999) identify the following motivational factors which correlated most positively with educators' ICT use, namely: perceived ability to use ICT; level of resources available and their satisfaction with ICT; and whether using ICT in teaching is considered to be interesting and enjoyable. The research also identifies difficulties experienced in using ICT as the most significant negative factor. Research conducted by Lundall & Howell (2000: 151) indicates that educators' positive attitude towards ICT can be correlated with high levels of educator access and training in ICT use and application.

Chapter 3

Research design and methodology

3.1 Introduction

The techniques used to obtain information for this research include a literature review (discussed in Chapter 2) and a survey research (questionnaires and interviews). In this chapter a brief overview of the study area is provided, as well as methods utilised, data collection and proposed data analysis

3.1.1 Study area

Due to the expectation that primary school educators should be competent in the use of ICT (South Africa...DoE...Revised, 2002), the population of this study was confined to primary school educators and principals (permanent or contract) in the neighbourhoods of Surrey Estate, Heideveld, Vanguard Estate and Welcome Estate in the suburb of Athlone in the Cape Metropole (Figure 2). Eight primary schools are located in these four residential areas. These areas were classified under the apartheid legislation as Coloured residential areas, but also differ in terms of class structure.

These four residential areas are adjacent to each other (Figure 3) and range from lower middle class to working class. The schools in these areas draw learners and several educators, mainly from these communities. In addition, the interest in these particular communities is based upon the researcher's experience of living in these communities. Heideveld location is on the Cape Flats, 22 kilometers from the Central Business District (CBD) of Cape Town, and adjacent to the N2 freeway to the north and Klipfontein Road to the south. Fifth Street to the west separates Heideveld from Vanguard Estate and Welcome Estate. Heideveld railway station to the east separates Heideveld from Guguletu. Residential housing in Heideveld is predominantly semi-detached; three storeys walk-up flats and state owned. Heideveld per capita monthly income in 1996 was R478 and can be classified as a working class residential area.

Welcome Estate and Vanguard Estate are adjacent to Vanguard Drive to the west. Klipfontein Road to the south separates Vanguard Estate from Greenhaven and Surrey Estate. Welcome Estate is adjacent to the N2 freeway to the north and Fourth Avenue

Figure 2 **Cape metropolitan context of the study area**
Scale 1: 275 000

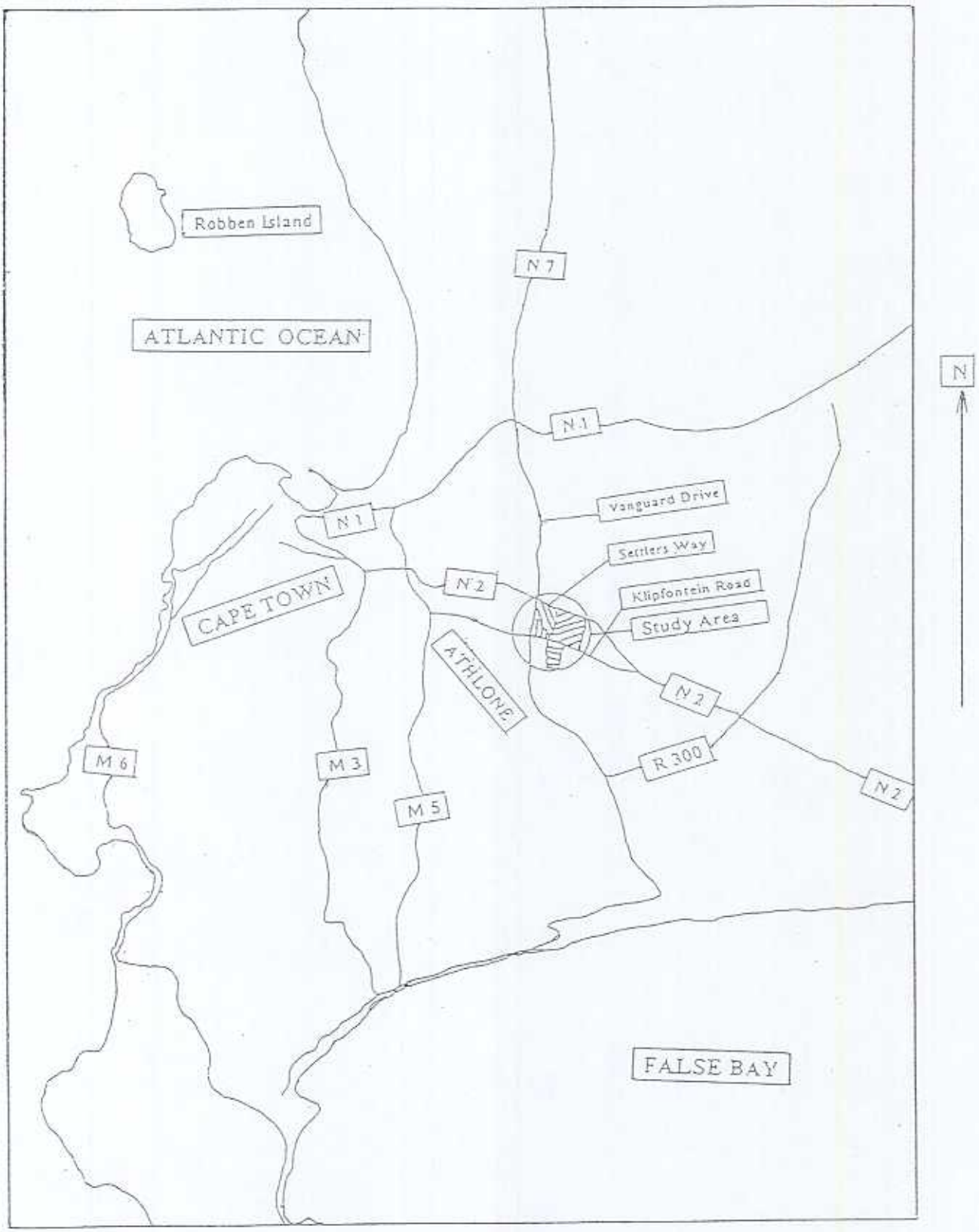

Figure 3 Study area
Scale 1: 20 000

to the south separates Welcome Estate from Vanguard Estate. Vanguard Estate and Welcome Estate residential housing were initially government owned properties, which predominantly consist of single dwellings and later offered for sale to inhabitants to be paid off over a period of time. Vanguard Estate per capita monthly income in 1996 was R1 113 and R1 169 respectively for Welcome Estate. Both Vanguard Estate and Welcome Estate can be classified as lower middle class residential areas.

Surrey Estate borders include Orion and Saturn Road to the west, Klipfontein Road to the north, Ruimte Road to the south and Aries Road to the east. Surrey Estate was classified under apartheid legislation as a Coloured, lower middle class and homeowner residential area. Surrey Estate per capita monthly income in 1996 was R901. The class differentiations between the four residential areas were developed artificially as a realisation of the Apartheid ideology of race and class separation and isolation[3]. In addition, the classification of these residential areas is based upon Statistics South Africa Census 96 community profile for Heideveld, Surrey Estate, Vanguard Estate and Welcome Estate (2002) (See Table 1).

Table 1: Socio-economic characteristics of suburbs

Suburb	Total Households	Total Population	House On Separate Stand	Town/ Cluster/ Semi - Detached House	Flat In Block Of Flats	Median Annual Household Income	Per Capita Monthly Income
Heideveld	3 665	17 388	1 080	1 113	1 014	R20 123	R478
Surrey Estate	2 118	9 070	1 650	158	34	R37 575	R901
Vanguard Estate	612	2 599	508	10	0	R49 040	R1 113
Welcome Estate	445	1 941	346	15	8	R46 126	R1 169

[3]The Group Areas Act and the Population Registration Act provided the legislation framework for these residential segregation and class differentiation and were the direct result of careful planning of the then apartheid state apparatus, specifically the National Housing and Planning Commission, the

As such, the research setting contains a cross-sectional pool of schools with differing levels of financial, physical and infrastructural resources available within the respective school communities. The focus of this research is limited to the study area and the findings and recommendations emanating from this research are applicable to the eight primary schools in the study area and should not be generalised to be applicable to all primary schools in the Athlone region.

3.1.2 Methods of data collection

Babbie and Mouton (2001: 230) state that surveys are perhaps the most frequently used research design in the social sciences. This phenomenon can be attributed to advances in computer technology, which has made the analysis of large data sets possible. Neuman (2000: 247) describes the survey as a means of gathering information that asks respondents about their beliefs, opinions, characteristics and past and present behaviour, in other words, self-reported beliefs or behaviour. Data collection by means of surveys is usually quantitative in nature and according to Leedy (2001: 101) quantitative research is used to answer questions about relationships among measurable variables in order to explain, predict and control phenomenona.

This survey research utilised two methods to obtain information from respondents. These methods include survey questionnaires (Appendix 5) as the main data collection instrument and scheduled structured interviews (Appendix 6) as a supplement to the questionnaire. The researcher administered the survey questionnaire to educators in each primary school. This approach allowed the researcher to clarify any uncertainties regarding the answering of questions by educators.

The questionnaire contained a variety of rating scales, open-ended as well as closed-ended questions. The nature of information elicited from educators, which corresponds with the objectives of this research included the following:

(1) assessment of current computer and Internet skills;

(2) identification of institutions and the extent to which primary school educators received computer and Internet training;

Department of Community Development, the Cape Town City Council, the Demarcation Boards and

(3) primary school educators' access to computers and the Internet at home, school and in the community for the accomplishment of teaching related tasks;
(4) the extent to and purposes for which primary school educators use the computer and the Internet for the accomplishment of teaching related tasks.

A pilot study of the questionnaire was conducted with 24 primary school educators at a primary school in the Athlone region. The pilot study was done with the aim of revising the survey instrument, if necessary, to ensure, as much as possible, an accurate measurement through the survey questionnaire. No problems were encountered with the administration of the survey questionnaire and the same survey instrument and procedures were applied to other schools in the study area.

The researcher also conducted scheduled structured interviews with principals of designated primary schools in order to provide the context and background information of each primary school and to gain deeper understanding that assisted in the interpretation of the survey. In addition, the scheduled structured interviews were used to identify factors influencing the objectives of this research in terms of educators access, training and use of computer resources at designated primary schools. The nature of information elicited from principals included the following:
(1) socio-economic condition of the areas the schools served;
(2) status of financial contribution of parents and fundraising activities of each school;
(3) financing of resources for educators' professional use, specifically the availability of computers, printers and Internet in each school;
(4) future computer technology plan of each school.

All interviews were recorded on audiotape. The use of scheduled structured interviews allowed the researcher to discuss issues with principals in greater depth. A pilot study of the interview schedule was conducted at a primary school in the Athlone region. The pilot study was done with the aim of revising the interview schedule, if necessary, to ensure, as much as possible, an accurate measurement through the interview schedule. No problems were encountered with the

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institutionalised in the practices of the Department of Coloured Affairs

administration of the interview schedule. The same interview schedule and procedures were applied to other schools in the study area.

3.1.3 Data collection

A letter of request was forwarded in March 2002 to the director of the Western Cape Education Department (WCED) of research for the study to be conducted at designated primary schools (Appendix 1). The WCED of research granted permission under certain conditions (Appendix 2). Telephonic appointments were made with primary school principals in April 2002, explaining to them the reasons for the survey and to enlist their support. A cover letter addressed to the principals (Appendix 3), educators (Appendix 4) and the permission letter from the WCED were forwarded to respective school principals. School principals granted permission for the survey research to be conducted at their respective schools after normal teaching hours when learners were sent home except for one principal in Heideveld who declined to be interviewed, but did allow the researcher to administer the survey questionnaire with educators.

Data collection began in May 2002. Survey questionnaires were administered with educators in school staff rooms while interviews were conducted on alternative days in designated principals' offices. The response rate for the survey questionnaire at the eight primary schools in the study area was 76.3%.

3.1.4 Data analysis

All returned questionnaires were examined for completeness and accuracy. The data collected were in the form of nominal data. Data collected from the questionnaire were gathered, coded and captured, using Statistical Package for the Social Sciences (SPSS) software in order to ascertain frequencies and general trends in responses. Frequencies and cross-tabulations of variables identified in the aims, objectives and problem statement of this research were compared against each other to identify patterns and relationships between variables. These variables included the following: educators (1) access, (2) training and (3) use of (4) computer/s and the (5) Internet to accomplishment of (6) teaching related tasks.

Relationships between variables were contextualised in terms of Ajzen's theory of planned behaviour. According to the theory of planned behaviour educators', use of computer resources are influenced by the following three pre-determinants of intentions, namely (1) attitude of educators towards using computer resources, (2) social pressure on educators to use computer resources and (3) educators perceived ease or difficulty of using computer resources. The second possibility is that educators' use of computer resources could be linked directly to educators' perceived ease or difficulty, reflecting on past experiences as well as anticipated impediments and obstacles.

In this study educators' perceived ease or difficulty refers to the extent to which educators have confidence in their ability to use computers and the Internet to accomplishment of teaching related tasks. The descriptive data were reported in frequencies and percentages and the comparison was generated in tabular form. Information, elicited from interviews with principals, was analysed and used to contribute to the interpretation of the survey.

Chapter 4

Presentation and interpretation of data

4.1 Result of the study at selected primary schools in the Cape Town suburb of Athlone in the Western Cape

4.1.1 Introduction

In this chapter presentation and interpretation of the background of designated primary schools are provided, including demographic profiles of educators. Designated primary schools are located in the neighbourhood of Surrey Estate, Vanguard Estate, Welcome Estate and Heideveld in the Cape Town suburb of Athlone in the Western Cape. Background information of schools were obtained from interviews conducted with respective primary school principals, however, out of the eight primary schools in the study area, one primary school principal declined to be interviewed. Demographic data of educators were obtained from section one of the survey questionnaire. The background and demographic profiles of educators are followed by a presentation on designated primary school educators' access, training and use of computer/s and the Internet to accomplishment of teaching related tasks. This information was obtained from section two, three, four and five of the survey questionnaire, which had a response rate of 76.3%. The chapter concludes with interpreting the above presentation in terms of Ajzen's theory of planned behaviour.

4.1.2 Background of the primary schools

4.1.2.1 Surrey Estate

4.1.2.1.1 Socio-economic condition of the areas the primary school served

A fair percentage of Surrey Estate residents' learners attend the school, however, there is an increase of learners from the less privileged areas, largely from the lower income groups of Heideveld, Manenberg and Guguletu who are attending the school. A probable explanation for the migration of these learners to schools located in middle class residential areas, might be due to the perception that such schools are better resourced and thus offer superior education than schools located in lower income residential areas. A high percentage of these learners come from single parent households where the mother is the only parent having to fend for the siblings. These

areas are also characterised by high unemployment with the result that parents find it difficult to pay school fees. The school also belongs to a feeding scheme but supplements the feeding scheme with the school's own fundraising activities.

4.1.2.1.2 School fees and fundraising activities

The school registered 950 learners for 2002 with a staff complement of 23 state employed and 5 governing body educators. The school has an average of 44 learners per class. In 1998 just over 50% of parents paid school fees and in 2001, 80% of parents paid school fees. The school fee for 2002 was set at R200 per learner. The school operates on a rebate system for more than one child in a family attending the school. School fees do not provide the necessary operating finance for administration and the salary of the five governing body educators, thus the reliance on continued fundraising activities. The governing body has budgeted R150 000 for the salary of those five governing body educators for 2002. The school has one fundraising activity per term, except for the last term unless it is absolutely necessary. The school had a carnival prior to the survey research being conducted at the school and according to one of the governing body members, the school was able to make a profit of R60 000 over a period of two days.

4.1.2.1.3 Computer resources available to learners

In 2000 the school sub-contracted Future Kids to operate at the school. Future Kids provided the school of a curriculum, computers, software and an educator. The school had to pay a levy per month for this organisation to operate at the school. The school had to recover R40 per learner per month and for many learners the fee was too expensive and subsequently Future Kids learner numbers dwindled and were phased out. The school management decided to go a different route since they wanted all of their learners to be exposed to computers and not only those who could afford it. The principal wrote numerous letters to institutions to sponsor them with computers but according to the principal it was an uphill battle. The school, however, did receive a donation of 10 outdated computers with only one computer with a CD-ROM drive. The school intends to buy 10 new computers by the end of the year for their computer laboratory. The school employs a full-time computer educator, as many educators do not have the capacity to take their class to the computer room and back up their own lessons. The computer educator works in close collaboration with other educators on

what they want the computer educator to concentrate on with learners in the computer room. All learners at the school receive two lessons of half an hour per week. Half the class attends at a time with two learners at a monitor, while the other half is with their educator in their respective classrooms.

4.1.2.1.4 Computer resources available to educators

The school has four computers and two printers available in the administration building. These computers were not connected to the Internet when the study was conducted. One computer with a printer is available exclusively for educators' use and is predominantly used to compose question papers, worksheets and assignment projects especially near the June assessment. Educators also make use of computers in the computer laboratory after school hours. According to the principal, less than 50% of educators make use of the computers at school although a few educators do have access to computers at home.

4.1.2.2 Vanguard Estate

4.1.2.2.1. Socio-economic condition of the areas the primary school served

Although the primary school is situated in an affluent area 30-40% of learners from Vanguard Estate attend the school. A probable explanation for this low attendance of learners from Vanguard Estate might be due to the fact that parents, who have the financial means, prefer to send their children to attend former model C or independent schools. Sixty to seventy percent of learners attending the primary school in Vanguard Estate come from areas such as Khayalitsha, Langa, Mitchell's Plain, Heideveld and Manenberg. The socio-economic conditions of these areas according to the principal are below the breadline. The school also belongs to a feeding scheme but supplements the feeding scheme with the school's own fundraising activities. The feeding scheme provides sustenance for about 40-60% of the learners at the school.

4.1.2.2.2 School fees and fundraising activities

The school registered 853 learners for 2002 with a staff complement of 22 state employed and 5 governing body educators. The school fee for 2002 was set at R240 per learner per annum. The principal envisaged that only 50% of school fees would be paid at the end of 2002. The school has at least one fundraising activity per term. The

type of fundraising activity is influenced by the contribution in school fees as well as the type of fundraising activity the majority of parents would support.

4.1.2.2.3 Computer resources available to learners

The school had a computer laboratory during the early 1970's but it became defunct due to a break in support material and theft. The principal wrote numerous letters to various institutions to sponsor them with computers but according to the principal it was an uphill battle. However, in November 2002 the school received a donation of 32 new Pentium III's and a file server from Mecer Computer Company. The school spent about R40 000 on the infrastructure of the computer laboratory (security gate, burglar bars, alarm system, ventilation, furniture etc.) and R20 000 on educational software. The school intends to connect all the computers to the Internet by the end of 2002. As part of the school's computer technology plan they envisaged to purchase another 10 new computers for the computer laboratory (learner/class ratio about 40 learners per class) before the end of 2003.

4.1.2.2.4 Computer resources available to educators

The school has three computers (Pentium I a 286 and a 386), two printers of which only one is operational and a computer scanner in the administration building. Only one computer, in the secretary's office, has Internet connection. The principal, secretaries and bursar predominantly use the computer resources for administration purposes. The computer resources are also available for educators' use. According to the principal of the school, educators do not make extensive use of the computer resources due to the computer resources not always being available and many educators are not computer literate.

4.1.2.3 Welcome Estate

4.1.2.3.1 Socio-economic condition of the areas the primary schools served

The majority of learners who attend the two primary schools come from areas such as Heideveld, Mitchell's Plain, Nyanga and also from surrounding informal settlements. The principal at one of the primary schools stated that many of these learners come to school without food and the food that they received from the feeding scheme is the only food that they will have for the day.

4.1.2.3.2 School fees and fundraising activities

The first primary school registered 580 learners for 2002 with a staff complement of 13 state employed educators of which 11 are permanent. The school fee for 2002 was set at R80 per learner per annum but operates on a rebate system for more than one child in a family attending the school. The parents' contribution towards school fees is on average between 30 - 40% and the principal attributes this to the high percentage of unemployed parents. The school has one fundraising activity per term, as it is a major source of income to the school.

The second primary school registered 600 learners for 2002 with a staff complement of 17 state employed and 3 governing body educators. The school fee for 2002 was set at R160 per learner per annum of which 172 learners paid their school fees in full and 189 paid partially. The principal describe parents' contribution towards school fees as very poor. The school has one big fundraising activity per term, except for the last term.

4.1.2.3.3 Computer resources available to learners

The first primary school has 12 refurbished 486 computers available in the school library for learners. The principal intends to update the computers and software if there is any money available by the end of the year. The second primary school does not have any computers available for learners.

4.1.2.3.4 Computer resources available to educators

The first primary school has one computer with a printer in the secretary's office. The school had Internet connection up to a point but is currently disconnected. The 12 computers in the school library are also available for educators' use. According to the principal of the school about 50% of educators are in need of computer training.

The second primary school has two computers with a printer and scanner available in the administration building. The one computer with Internet connection, printer and scanner is available exclusively for educators' use. Telkom sponsored the computer, two days of computer training for two staff members and the first year of Internet connection. According to the principal of the school about 50% of educators are not computer literate.

4.1.2.4 Heideveld

4.1.2.4.1 Socio-economic condition of the areas the primary schools served

The majority of learners who attend the three primary schools come from the Heideveld area and a fair percentage of learners come from surrounding areas such as Guguletu, Nyanga and informal settlements. The socio-economic condition of the Heideveld area can be described as very poor, where unemployment, single parenting, drug abuse and substance abuse are rife. Many of these learners come to school without food. The three primary schools belong to a feeding scheme, however, the demand for feeding these learners outstrips the supply and for many schools it is an uphill battle to provide sustenance to all needy learners.

4.1.2.4.2 School fees and fundraising activities (See Table 2)

The first primary school registered 793 learners for 2002 with a staff complement of 20 state employed and 2 governing body educators. The school fee for 2002 was set at R80 per learner per annum. The parents' contribution towards school fees is less than 50% and the principal attributes this to the socio-economic condition of the Heideveld area. The school has one big fundraising activity per term. The school's anticipated income for 2002 is approximately R164 000 and the school expenditure is more or less the same.

The second primary school registered 402 learners for 2002 with a staff complement of 13 state employed educators. The school fee for 2002 was set at R90 per learner per annum. The parents' contribution towards school fees is on average between 30-40%. The school has regular weekly fundraising activities as a means to generate funds.

The third primary school registered 947 learners for 2002 with a staff complement of 23 state employed and 3 governing body educators. The school fee for 2002 was set at R40 per learner per annum. The parents' contribution towards school fees is on average between 60-70%. The school has monthly fundraising activities and one or two big fundraising activities per quarter.

Table 2: School fees and fundraising activities

Primary school	Registered learners for 2002	Educator complement for 2002	School fees for 2002	Parents contribution towards school fees for 2002	Frequency of fundraising activities for 2002
1	793	22	R80 p/a	>50%	One big fundraising activity per term
2	402	13	R90 p/a	<30%>40%	Weekly fundraising activities
3	947	26	R40 p/a	<60%>70%	Monthly & one or two big fundraising activities per quarter

4.1.2.4.3 Computer resources available to learners

None of the primary schools had computer resources available to learners.

4.1.2.4.4 Computer resources available to educators

The three primary schools each has two computers of which one in each school is connected to the Internet and a printer available in their school administration buildings. Only one primary school has a computer scanner. Educators do not make extensive use of these computer resources, which are predominantly used by school secretaries for administration purposes. According to the three school principals the majority of educators at their respective schools are not computer literate. At one primary school educators normally ask the school secretary to download information for them from the Internet the day prior to them having the lesson in class.

4.1.3 Demographic data of educators

Educators' age, gender, highest education qualification, teaching experience and first language were tabulated by frequencies and percentages. The average age of the 121 educators, with five missing values, was 39 years (Figure 4) with an average teaching service, with three missing values of 16 years (Figure 5). The effects of the rationalisation process may have contributed to the high average age and teaching

service of educators, which in effect may have discourage young graduates from taking up teaching as a profession. This assumption can be deduced from the study analysis that out of 121 educators, 4 educators are between the ages of 22 and 27 years (Figure 4). Meerkotter & Fataar (2001: 5) argue that South Africa may have a shortage of some 100 000 educators within the next four or five years, which constitutes roughly 25% of the number currently employed.

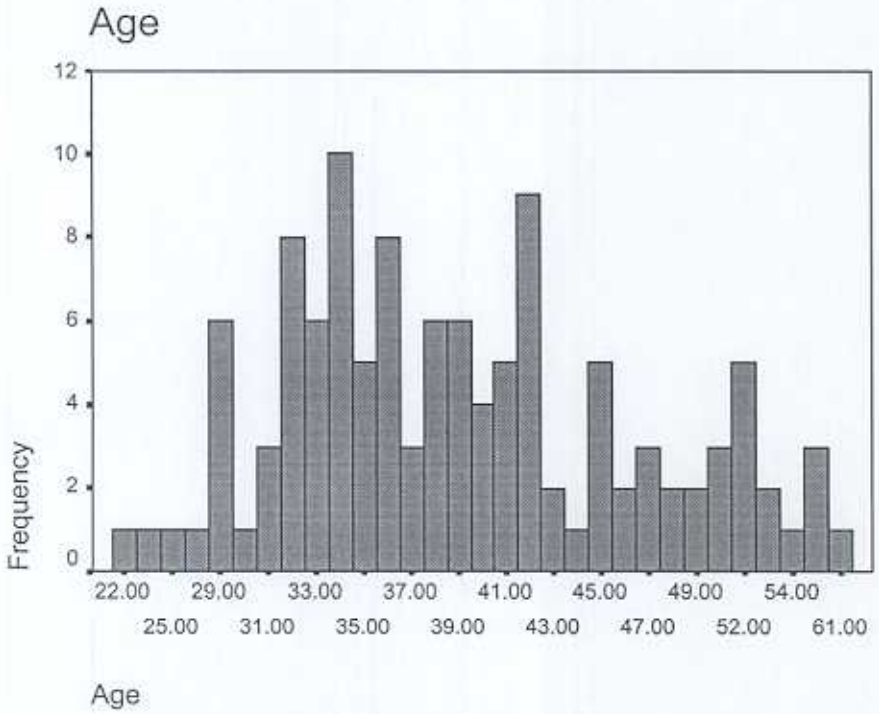

Figure 4: Age frequency bar chart of educators

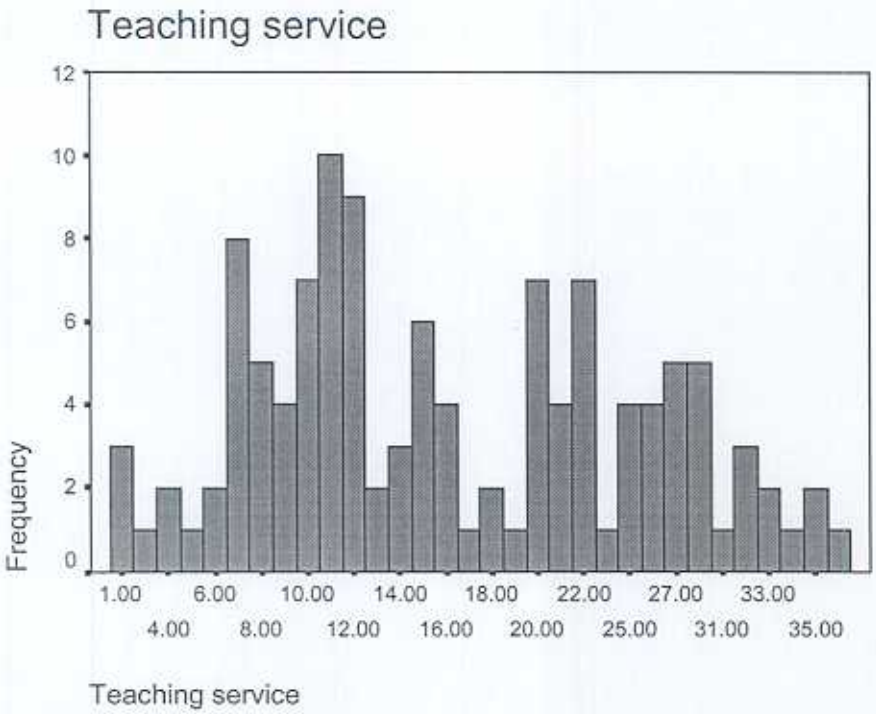

Figure 5: Teaching service frequency bar chart of educators

In terms of educators' first language, 66.1% were English, followed by Afrikaans with 33.1%, and Xhosa with 0.8%. An interesting phenomenon observed during the administration of the survey research at schools was the high number of Xhosa speaking learners attending schools in the study area that offer English as a medium of instruction, with only one first language Xhosa speaking educator employed at a primary school in Surrey Estate.

Mtshali (2002: 19) argues that this phenomenon started to emerge a decade ago, when racial laws ceased to force Black parents to send their children to Black schools only and also due to the perception that historically Coloured, White and Indian suburban public schools are better resourced and thus offer superior education than public schools in predominantly Black township areas. This resulted in many suburban schools having a racial mix of learners, but not necessarily in terms of the teaching staff complement. The employment equity plan adopted by the Western Cape Education Department (WCED) intends to rectify these imbalances by filling teaching

vacancies with candidates from designated groups (Van der Merwe, 2002a: 6). Two schools in the Heideveld area have Afrikaans as the only medium of instruction.

Out of the 121 educators who responded, 21.5% were males and 78.5% were females. The high number of females employed in the designated primary schools reinforces the general stereotype that schools are predominantly associated with female educators and poses a big challenge for the WCED to convince and encourage prospective male graduates to take up teaching as a career. According to the Minister of Education in the Western Cape, male educators employed in the WCED schools are under-represented by 12%, while female educators are over-represented by 12% but under-represented in managerial positions and the employment equity plan commits the Department to address these imbalances over the next five years (Gaum, 2002)

In terms of educators' highest education qualification, 42.1% have Standard ten with a three years teaching diploma while 24.8% have Standard ten plus a four years teaching diploma and 9.9% have Standard ten with a two years teaching diploma and 8.3% have standard eight with a teaching diploma (Figure 6). Seventy percent of educators with standard eight with a teaching diploma are between the ages of 45 to 58 years old. According to one primary school principal these educators are the seniors in so far experiences are concerned but have a very low ranking due to not having the necessary certificates and are reluctant to improve their qualifications as they are near their retirement age.

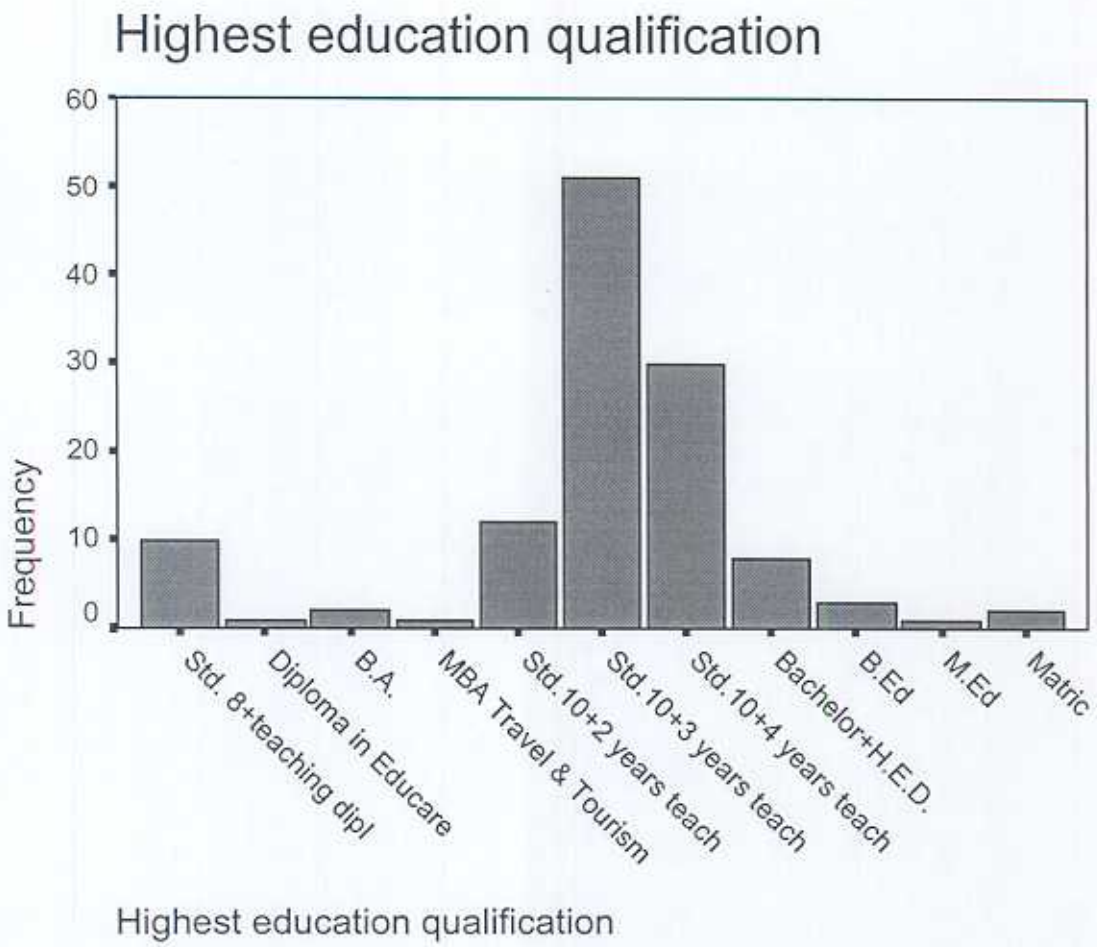

Figure 6: Highest education qualification frequency bar chart of primary school educators

4.1.4 Presentation of educators' access, training and use of computer/s and the Internet to accomplishment of teaching related tasks

4.1.4.1 Assessment of educators' computer application software skills

Educators' database, spreadsheet, word processing, Internet search engines, CD-ROM, e-mail and web-publishing application software skills were tabulated by frequencies and percentages. Of the 121 educators responding, 78.5% do not know how to use database (Microsoft Access); 68.6% do not know how to use spreadsheet (Microsoft Excel), CD-ROM and e-mail; 71.9% do not know how to use Internet search engines; 85.1% do not know how to use web-publishing for example Microsoft FrontPage or Notepad HTML and 52.1% do not know how to use word processing (Microsoft Word or Word Perfect).

4.1.4.2 Educators' computer software training

Educators' database, spreadsheet, word processing, Internet search engines, CD-ROM, e-mail and web-publishing application software training were tabulated by frequencies and percentages.

4.1.4.2.1 Word-processing software training

Eighty-two point six percent of educators did not receive any word-processing training from a university or college. In comparison, a similar high percentage of 76.9% of educators did not receive any word processing training from private institutions. The high average age of educators in the study is also an indication that many of these educators graduated when computer and Internet technology was not readily available at colleges and universities and consequently not integrated in their teaching curriculum and preparation. Only 16.5% of educators taught themselves how to use word processing software and similarly 2.5% and 8.3% of educators received frequent word processing training from work experiences outside teaching and from friends.

4.1.4.2.2 Spreadsheet software training

Eighty six percent of educators did not receive any spreadsheet training from a university or college while 2.5% received frequent spreadsheet training from the same institutions. In comparison, 77.7% of educators did not receive any spreadsheet training from private institutions while only 5.8% received frequent spreadsheet training from the same institutions. Only 12.4% of educators taught themselves how to use spreadsheet software and similarly 1.7% and 4.1% of educators received frequent spreadsheet training from work experiences outside teaching and from friends.

4.1.4.2.3 Database software training

Ninety two point six percent of educators did not receive any database training from a university or college while 2.5% received frequent database training from the same institutions. In comparison, 88.4% did not receive any database training from private institutions while 4.1% received frequent database training from the same institutions. Only 5.8% of educators taught themselves how to use database software and similarly

0.8% and 2.5% of educators received frequent database training from work experiences outside teaching and from friends.

4.1.4.2.4 CD-ROM software training

Ninety one point seven percent of educators did not receive any CD-ROM training from a university or college while 4.1% received frequent CD-ROM training from the same institutions. In comparison, 88.4% did not receive any CD-ROM training from private institutions while 5% received frequent CD-ROM training from the same institutions. Only 13.2% of educators taught themselves how to use CD-ROM software and similarly 1.7% and 8.3% of educators received frequent CD-ROM training from work experiences outside teaching and from friends.

4.1.4.2.5 Internet search engine training

Ninety two point six percent of educators did not receive any Internet search engine training from a university or college while 3.3% received frequent Internet search engine training from the same institutions. In comparison, 90.1% did not receive any Internet search engine training from private institutions while 5% received frequent Internet search engine training from the same institutions. Only 10.7% of educators taught themselves how to use Internet search engine and similarly 1.7% and 9.1% of educators received frequent Internet search engine training from work experiences outside teaching and from friends.

4.1.4.2.6 E-mail training

Ninety two point six percent of educators did not receive any e-mail training from a university or college while 3.3% received frequent e-mail training from the same institutions. In comparison, 88.4% did not receive any e-mail training from private institutions while 5.8% received frequent e-mail training from the same institutions. Only 11.6% of educators taught themselves how to use e-mail and similarly 1.7% and 9.1% of educators received frequent e-mail training from work experiences outside teaching and from friends.

4.1.4.2.7 Web-publishing training

Ninety eight point three percent of educators did not receive any web-publishing training from a university or college while 1.7% received frequent web-publishing

training from the same institutions. In comparison, 95.9% did not receive any web-publishing training from private institutions while 1.7% received frequent web-publishing training from the same institutions. Only 4.1% of educators taught themselves how to use web-publishing and similarly 0.8% and 2.5% of educators received frequent web-publishing training from work experiences outside teaching and from friends.

4.1.4.3 Educators' access to computers

Eighty five point one percent of educators have access to computers. The majority of the 85.1% of educators has either access only at home (27.3%) or school (19.8%) or at both places (18.2%) (Table 3). Of the 14.9% of educators that do not have access to computers, 7.4% indicated that computers are too expensive and they cannot afford it, 4.1% indicated that they do not have access to a computer at home or school and 4 missing values were observed.

4.1.4.4 Educators' access to computer printers

Eighty-two point six percent of educators have access to computer printers. The majority of the 82.6% of educators has either access only at school (32.2%), home (22.3%) or at both places (14.9%). The majority (5%) of the 17.4% of educators that do not have access to computer printers indicated that computer printers are too expensive and 11 missing values were observed.

4.1.4.5 Educators' access to computer scanners

Forty-three point eight percent of educators have access to computer scanners. The majority (20.7%) of the 43.8% of educators indicated that they have access to a computer scanner at school. The majority (9.1%) of the 56.2% of educators that do not have access to computer scanners indicated that computer scanners are too expensive and 27 missing values were observed.

4.1.4.6 Educators' use of computers

Forty-one point three percent of educators' use computers to accomplish teaching related tasks. The majority (17.4%) of the 41.3% of educators' use the computer to accomplish teaching related tasks at home (Table 4). The majority (30.6%) of the

58.7% of educators that do not use computers to accomplish teaching related tasks indicated that they are not computer literate.

Of the 121 educators responding to using the computer to create instructional material (worksheets, tests) 62% do not use it at all, 5.8% create daily instructional material, 22.3% create weekly instructional material, 6.6% create monthly instructional material, 1.7% create twice a year instructional material and 2 missing values were observed.

Of the 121 educators responding to using the computer for administrative record keeping (attendance, reports), 76% do not use it at all, 1.7% use the computer daily, 11.6% use the computer weekly, 6.6% use the computer monthly and 2.5% use the computer twice a year for administrative record keeping and 2 missing values were observed.

Of the 121 educators responding to using the computer to access information via CD-ROM software, 75.2% do not use it at all, 14.9% use it weekly, 5% use it monthly, 3.3% use it daily and 0.8% use it twice a year and 1 missing value was observed. Hundred and nineteen educators do not use the computer to accomplish any other professional teaching activities and 2 missing values were observed.

4.1.4.7 Educators' access to the Internet

Sixty-four point five percent of educators have access to the Internet. The majority of the 64.5% of educators has either access only at school (32.2%), home (11.6%) or at both places (9.1%) (Table 5). The majority (11.6%) of the 35.5% of educators that do not have access to the Internet indicated that Internet connection is too expensive and 12 missing values were observed.

4.1.4.8 Educators' use of the Internet

Eighteen point two percent of educators use the Internet to accomplish teaching related tasks. The majority of the 18.2% of educators use the Internet to accomplish teaching related tasks either only at home (5.8%) or only at school (4.1%) or at both places (3.3%) or at friends' houses (3.3%)(Table 6). The majority (38.8%) of the 81.8% of educators that do not use the Internet to accomplish teaching related tasks,

indicated that they are not Internet literate and 19% indicated that they cannot afford the Internet subscription.

Of the 121 educators responding to using the Internet to gather information for lesson planning, 84.3% do not use it at all, 5.8% use it weekly, 6.6% use it monthly and 1.7% use it daily and twice a year.

Of the 121 educators responding to using the Internet to access model lesson plans, 90.1% do not use it at all, 0.8% use it daily, 2.5% use it monthly, 3.3% use it weekly and 1.7% use it twice a year and 2 missing values were observed.

Of the 121 educators responding to using the Internet to access research and best practice teaching, 89.3% do not use it at all, 3.3% use it monthly, 0.8% use it daily and 2.5% use it weekly and twice a year and 2 missing values were observed.

Of the 121 educators responding to using the Internet to access information and resources to use in the classroom, 83.5% do not use it at all, 4.1% use it weekly, 3.3% use it twice a year, 5.8% use it monthly and 2.5% use it daily.

Of the 121 educators responding to using the Internet to send/receive e-mail to/from (colleagues, parents), 85.1% do not use it at all, 4.1% use it daily, 5.8% use it weekly, 2.5% use it twice a year and 0.8% use it monthly and 2 missing values were observed. Hundred and nineteen educators do not use the Internet to accomplish any other professional teaching activities and 2 missing values were observed.

Table 3: Access to a personal computer

Access to a personal computer * Place/s of computer access Crosstabulation

			Place/s of computer access																
			(1)	1)+(3)+(4	(2)+(3)	(12)+(3)	(14)+(2)	(16)+(2)	(4)+(2)	(1)+(2)+ (3)+(14)	(2)	(2)+(4)	(3)	(1)+(2)	1)+(2)+(3)+	(2)+(3)+(·	(8)	(3)+(4)	Total
Access to a pe	Yes	Count	33	1	4	1	1	1	1	1	24	1	5	22	6	1		1	103
computer		% of To	27.3%	.8%	3.3%	.8%	.8%	.8%	.8%	.8%	19.8%	.8%	4.1%	18.2%	5.0%	.8%		.8%	85.1%
	No	Count															18		18
		% of To															14.9%		14.9%
Total		Count	33	1	4	1	1	1	1	1	24	1	5	22	6	1	18	1	121
		% of To	27.3%	.8%	3.3%	.8%	.8%	.8%	.8%	.8%	19.8%	.8%	4.1%	18.2%	5.0%	.8%	14.9%	.8%	100.0%

(1) = Home

(2) = School

(3) = Friend's house

(4) = Family's house

(8) = Not applicable

(12) = Internet café

(14) = Library

(16) = Church

Table 4: Use of a personal computer to accomplish teaching related tasks

Use of a personal computer to accomplish teaching related tasks * Place/s of computer use Crosstabulation

			Place/s of computer use								
			(1)	(1)+(2)+(3)+(10)	(2)	(3)	(1)+(2)	(1)+(2)+(3)	(8)	(2)+(4)	Total
Use of a personal computer to accomplish teaching related tasks	Yes	Count	21	1	5	2	18	2		1	50
		% of Total	17.4%	.8%	4.1%	1.7%	14.9%	1.7%		.8%	41.3%
	No	Count							71		71
		% of Total							58.7%		58.7%
Total		Count	21	1	5	2	18	2	71	1	121
		% of Total	17.4%	.8%	4.1%	1.7%	14.9%	1.7%	58.7%	.8%	100.0%

(1) = Home

(2) = School

(3) = Friend's house

(4) = Family's house

(8) = Not applicable

(10) = Library

Table 5: Access to the Internet

Acess to the Internet * Place/s of Internet access Crosstabulation

			Place/s of Internet access												
			(1)	(3)+(4)	(3)+(11)	(11)+(2)	(14)+(2)	(1)+(2)+ (3)+(11)	(2)	(3)	(4)	(1)+(2)	(8)	(2)+(3)	Total
Acess to t	Yes	Count	14	1	1	1	1	1	39	4	1	11		4	78
Internet		% of Tot	11.6%	.8%	.8%	.8%	.8%	.8%	32.2%	3.3%	.8%	9.1%		3.3%	64.5%
	No	Count											43		43
		% of Tot											35.5%		35.5%
Total		Count	14	1	1	1	1	1	39	4	1	11	43	4	121
		% of Tot	11.6%	.8%	.8%	.8%	.8%	.8%	32.2%	3.3%	.8%	9.1%	35.5%	3.3%	100.0%

(1) = Home

(2) = School

(3) = Friend's house

(4) = Internet café

(8) = Not applicable

(11) = Library

(14) = Family

Table 6: Use of the Internet to accomplish teaching related tasks

Use of the Internet to accomplish teaching related tasks * Place/s of Internet use Crosstabulation

			Place/s of Internet use							
			(1)	(1)+(3)+(11)	(2)	(3)	(1)+(2)	(8)	(2)+(3)	Total
Use of the Internet to accomplish teaching related tasks	Yes	Count	7	1	5	4	4		1	22
		% of Total	5.8%	.8%	4.1%	3.3%	3.3%		.8%	18.2%
	No	Count						99		99
		% of Total						81.8%		81.8%
Total		Count	7	1	5	4	4	99	1	121
		% of Total	5.8%	.8%	4.1%	3.3%	3.3%	81.8%	.8%	100.0%

(1) = Home

(2) = School

(3) = Friend's house

(8) = Not applicable

(11) = Library

4.1.5 Interpretation of educators' access, training and use of computer/s and the Internet to accomplishment of teaching related tasks in terms of the Ajzen's theory of planned behaviour

The presentation of educators' access to, training and use of computer/s and the Internet to accomplishment of teaching related tasks will be contextualised in terms of Ajzen's theory of planned behaviour. Only six of the eight schools in the study area have Internet connections. One primary school has a computer with a printer, exclusive for educators' use while in comparison only two primary schools have a computer with a printer, scanner and Internet connection exclusive for educators' use.

Educators in the study indicated positive attitudes towards using ICT in their teaching and manifested this positive attitude by their willingness to attend free computer and Internet courses that would empower them with the necessary confidence in their ability to use computer and Internet applications in education.

All the educators indicated that they would attend free computer and Internet courses, if offered by the WCED that would allow them to use computer technology, either for one or all of the following applications or a combination of applications namely (1) as a tool for information acquisition and web-publishing (CD-ROM and Internet search); (2) word processing, spreadsheet and database software application in teaching; (3) to teach computer literacy; (4) as a teaching and learning tool in all subjects and (5) communication (using e-mail).

Educators' positive attitudes towards embracing ICT was further reinforced by their willingness to enter into an agreement with the WCED to buy personal computers (including or excluding accessories) on their behalf and would allow the WCED to subtract thirty rand per month from their salaries to recover the purchasing cost. Fifty three point seven percent of educators indicated that they would enter into an agreement with the WCED. The majority (30.6%) of the 46.3% of educators who are against the arrangement indicated they already have a computer.

The survey questionnaire did not ask educators to respond to any social pressure exerted on them to use or not to computers and the Internet. The subjective norm included in Ajzen's theory is represented in this study by the perceived social pressure

of the National Curriculum Statement on educators to use ICT, especially on educators at schools that have ICT equipment and resources. Other perceived social pressure on educators includes growing expectation of the mass media, parents and colleagues.

In terms of educators' computer and Internet application software training from public institutions, for example, from a university or a college, 90.91% of educators on average did not receive any CD-ROM, Internet search engine, e-mail, web-publishing, spreadsheet, word processing and database software training. Educators' low computer and Internet application software training can be correlated with the high percentage of educators (70.48% on average) that do not know how to use Microsoft Excel, Access, Word or Word Perfect, Microsoft FrontPage or Notepad HTML, CD-ROM, Internet search engines and e-mail, This may explain why educators have limited use of such technology to the attainment of teaching related tasks at home and at school.

The low percentage of school computer and Internet use by educators for the achievement of teaching related tasks is due to the high computer and Internet application software illiteracy levels of educators and the computers and the Internet in the majority of schools are being used by the school secretaries for administration purposes and are not readily available for educators' use.

The perceived behavioural control component of Ajzen's theory that exerted an obstacle to educators' confidence in their ability to use computers and the Internet in accomplishing teaching related tasks included educators' limited access to computer and Internet resources at school and to a lesser extent at home. Educators' access to computer resources does not necessarily translate into use, but access is a prerequisite for educators' computer use. The major inhibiting factor to educators' use of the technology, apart from access, is the lack of computer and Internet application software skills.

Although the majority of Surrey Estate, Vanguard Estate, Welcome Estate and Heideveld primary school educators have access to computers at home and to the Internet at school, the absence of adequate training for educators in the field of

computer and Internet application software, including limited available computer resources exclusive for educators' use at schools had a negative effect on educators' use of such technologies at schools to the accomplishment of teaching related tasks.

We can thus derive from the above descriptive statistics that there is a link between Surrey Estate, Vanguard Estate, Welcome Estate and Heideveld primary school educators' computer and Internet access as well as computer and Internet application software training and the extent to which such technologies are utilised for accomplishing teaching related tasks. The ability of educators to use ICT resources is thus influenced by two external factors, namely adequate access to ICT resources and adequate training in their use (See Figure 7).

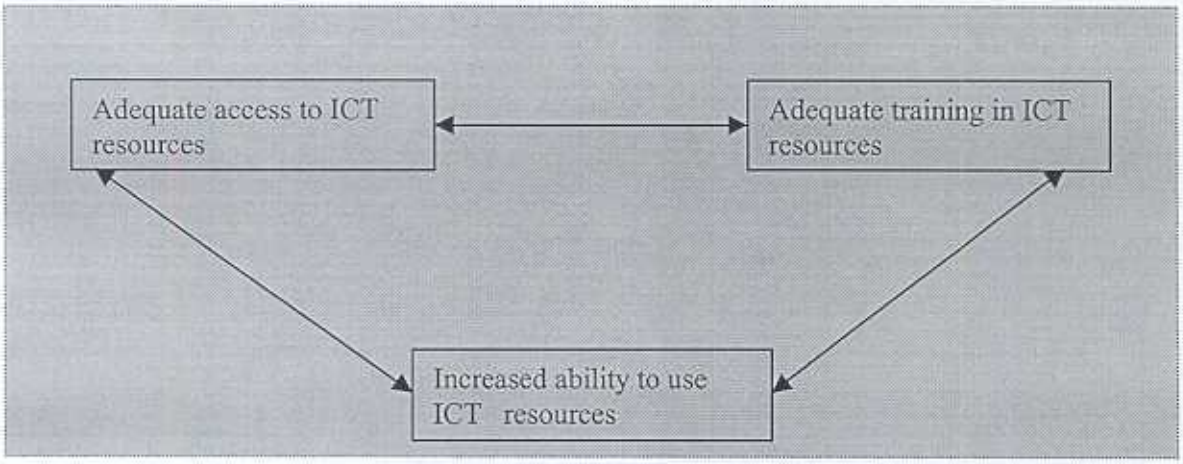

Figure 7: Factors shaping ICT use ability

Chapter 5

Conclusion and recommendations

5.1 Introduction

In this chapter the researcher will be discussing the conclusions reached based on the findings of the research in terms of the literature review, background of the primary schools and statement of the problem, which was to determine whether there was any link between the designated primary school educators' computer and Internet access and training, and the extent to which such technologies are utilised for accomplishing teaching related tasks. The chapter concludes with recommendations for further research.

5.1.1 Conclusion

The funding of schools in South Africa is set out in the South African Schools Act of 1996, which provides for a system of school fees to complement limited state funding to schools; the National Norms and Standards for School Funding of 1998, which provides for the exemption of school fees for lower income parents as well as the Employment of Educators Act of 1998. These policies form the regulatory framework for school funding and cannot be discussed without referring to the political economy in South Africa.

In 1996 the South African government moved away from its vision that articulated massive investment into social reconstruction (Reconstruction and Development Program) and adopted a macro economic strategy, which emphasises fiscal discipline that prioritises economic growth over redistribution. While this policy suits global capital and international financial institutions, it limits the government in making massive investment in social services. The adoption of this policy resulted in both the National and Provincial Education Departments having extremely limited resources available for redress (Porteus, 2002: 11- 17).

Research conducted on the impact of state funding and school fees on Gauteng public schools concluded that the total expenditure per learner in schools (combining government funding and school fees) dramatically favours children with higher socio-

economic status schools (Vally, 2002: 27). With the absence of equipment and resources in neglected communities, learners will be limited to theoretical knowledge (awareness) of ICT without practical hands-on experience. The practical application of ICT seems to be confined to schools (predominantly private and former model C schools) that have the financial means to invest, equip and sustain ICT acquisition and resources and in educators development (Van der Merwe, 2001: 9).

Lundall & Howell (2000: 98) concluded that financial contributions of parents and fundraising activities of schools will be critical factors determining if schools in South Africa can offer proper IT and more specifically ICT education for its learners. The success of ICT application in schools (which have the necessary resources and equipment) is dependent on educators' competent skills in using the technology as a teaching and learning tool as well as an understanding of the pedagogical implications.

This raises the question of the practical application and implementation of the Technology learning area, specifically the ICT strand. The Draft Revised National Curriculum Statement for Grades R–9 (2001), for example, states that a school where possible in the ICT strand (that has the necessary equipment and resources) should develop learners' ICT skills. The National Education Department claims that it does not have the financial means to equip all state schools with ICT equipment and resources given the appalling conditions within which the majority of schools in South Africa operate (South Africa…DoE…Strategy, 2001: 5). Added to this is the fact that ICT equipment becomes obsolete within a few years and upgrading and maintenance will be an additional financial burden on the Education Budget.

The review committee proposed the exclusion of the Technology learning area due to the absence of equipment and resources in the majority of schools in South Africa and recommended that the learning area be introduced when educators are trained and when resources become available. The CEM rejected this proposal and undertook to make extensive resources available to help educators in this learning area.

Primary schools in Heideveld and to, a certain extent in Welcome Estate, nevertheless experience external negative socio-economic factors outside their control that have a

constraining impact on their ability to become ICT ready. External negative socio-economic factors include the high number of learners coming to school without adequate sustenance, which is indicative of the poverty stricken living conditions of these learners. The National Education Department acknowledged that current feeding schemes consisting of bread and peanut butter is nutritionally inadequate and is considering in collaboration with the Department of Health to provide all Grade one to nine learners, whose families that cannot afford to provide them with adequate sustenance, with a daily nourishing school lunch (South Africa...DoE...Report to the..., 2003: 60).

In addition, the National Education Department in collaboration with the Department of Social Development is also considering whether the eligibility for a child support grant could automatically qualify a household for an exemption from the payment of school fees. A second proposal includes prohibiting poor schools from charging school fees, which received adequate state funding. Such schools could restore charging school fees, depending on an appeals process (South Africa...DoE...Report to the..., 2003: 116).

The average school fees in 2002 for primary schools in Surrey Estate and Vanguard Estate (lower middle class residential areas) was set at R220 per learner and it is expected that 65% of the total parents will be in a position to pay this amount. In comparison, the average school fees in 2002 for the three primary schools in the Heideveld area (working class residential area) were set at R70 per learner and it is expected that 55% of the total parents will be in a position to pay this amount. We can thus conclude that the lower socio-economic status of the area in which the school is situated could be correlated with lower school fees and fewer parents that will pay.

However, the research also negates the above correlation. For example, although Welcome Estate is a lower middle class residential area, the majority of learners attending primary schools in the area come from poor communities with the result that some primary schools set the same amount of school fees as primary schools located in working class residential areas such as Heideveld. We can thus conclude that the ability of schools to collect school fees is not necessarily linked to the socio-

economic status of the area in which the school is situated, but rather linked to the socio-economic status of learners attending the school.

Internal factors within the control of school management also contribute to the ability of these schools to become ICT ready. Internal factors will generally refer to the ability and competence of school principals, in collaboration with educators, parents and governing bodies of individual schools to use available resources creatively in and outside the school community to become ICT ready within a given period of time. Available resources could include soliciting sponsorship from individuals or businesses in or outside the school community, innovative fundraising activities etc. This requires proactive management skills of school principals to plan, organise, direct and control available resources to achieve stated school ICT aims and objectives.

Although the primary schools in Surrey Estate and Vanguard Estate experienced similar external negative socio-economic factors as in the Heideveld area, the school principals in collaboration with educators, parents and governing bodies were able to transcend these negative socio-economic factors by maintaining higher school fees than schools located in working class residential areas such as Heideveld. Proactive management skills of school principals in Surrey Estate and Vanguard Estate to attract private companies and individuals to sponsor their schools with needed resources as well as innovative fundraising activities were contributing factors to the ability of these schools to become ICT ready.

In an interview with Mr Bloomberg, responsible for the needs analysis of the Khanya project, I posed the question of what initiatives are currently available to disadvantaged schools in helping them become ICT ready. His response was that the Khanya project only determines if a school is ICT ready or not based on certain criteria. Examples of management criteria used by the Khanya project include individual schools' ability to attract private sponsorship, fundraising ability, provision of effective security etc. I posed the same question to a circuit manager in the Athlone region. His response was that these schools should apply for funding from education authorities. From these responses we can conclude that the ICT policy adopted by the National and Provincial Education Departments only benefits those schools that

conformed to certain criteria without any strategic plans in place to help those schools that do not conform to these criteria.

However, the majority of educators employed at the eight primary schools in the study area projected positive attitudes towards using ICT in their teaching. The subjective norm included in Ajzen's theory is represented by the perceived social pressure of the National Curriculum Statement on educators to use ICT, especially on educators at schools that have ICT equipment and resources. The perceived behavioural control component of Ajzen theory that exerted an obstacle to educators' confidence in their ability to use computers and the Internet in accomplishing teaching related tasks included educators' limited access to computer and Internet resources at school and to a lesser extent at home. The major inhibiting factor to educators' use of the technology, apart from access, is the lack of computer and Internet application software skills.

We can thus conclude that educators' access to computer resources in the absence of adequate computer and Internet application software training for educators including limited available computer resources for educators use at schools have a negative effect on educators' use of such technologies at schools to the attainment of teaching related tasks. In preparing South African learners for the global economy in the information age it is imperative that the government within its financial constraints invest in educators' training and make the necessary resources available accompanied with a coherent implementation plan that addresses the issues of equity, redistribution and capacity building in all of South African public schools.

5.1.2 Recommendations

The primary responsibility of providing ICT resources in public schools is the responsibility of education authorities in collaboration with the management of individual schools and not the responsibility of individual schools alone. ICT policy should be accompanied by an implementation plan, which is coherent and addresses the issues of equity, redistribution and capacity building especially in disadvantaged schools.

The Accenture Markle Foundation & United Nations Development Programme (2001) proposed the following basic elements that should be included in any strategy regarding the adoption of ICT resources, which include promoting innovative solutions by involving all the stakeholders in a broad, innovative, aligned and co-ordinated strategic partnership, which requires clear vision and direction, defined roles and responsibilities of the stakeholders involved and also adequate funding.

Primary school principals in Vanguard Estate, Welcome Estate, Heideveld, Surrey Estate and the circuit manager should meet on a monthly basis as a group to discuss and exchange information and ideas on how each school perceived, approached and experienced the adoption of ICT resources. The key element according to the Accenture Markle Foundation & United Nations Development Programme (2001) is the involvement of all stakeholders in the design of strategies as well as their implementation to create a win-win situation. Strategic partnership, collaboration and co-ordination are required between principals, educators, governing bodies and education officials with each component having specific roles and responsibilities. This process should be open, transparent, participatory and inclusive with a bottom-up approach

Individual schools should provide the circuit manager with compulsory half yearly reports of external and internal factors experienced by individual schools as either hindering or promoting the adoption of ICT resources. The report should include the envisaged strategic, tactical and operational plans of schools including proposed strategies of how they intend to use available resources creatively in order to reach their ICT vision, aims and objectives within a given period of time. ICT plans that clearly identify vision, aims, objectives and strategies within the needs and context of individual schools are more likely to develop effective approaches in the adoption of ICT resources.

The circuit manager must provide relevant funding authorities with compulsory annual progress reports of the ICT status of individual schools based upon individual schools half yearly reports, minutes of monthly meetings, inspection of learning sites and interviews with educators and governing bodies of individual schools. National ICT policy must address the needs and opportunities emerging from local contexts as

this has direct implications for the sustainability and scalability of local schools' initiatives, especially in disadvantaged schools. Circuit managers should provide the necessary leadership to confront existing problems experienced by individual schools in the adoption of ICT resources.

In terms of capacity building, the provision of computer laboratories to schools should be preceded by ensuring that educators have adequate access to and training in using the technology first as a tool to be used in accomplishing teaching related tasks. This approach will ensure that educators experience the benefits, confidence and competence in using the technology as an aid in their daily teaching practice before being trained to use the technology as a teaching and learning tool. Studies conducted by Williams *et al.* (2000) in Scotland on primary and secondary school educators experience of ICT training and use, identify that the high level of educators' access to computers had enabled them to become more familiar with ICT, with the result that educators integrated ICT more effectively into their teaching practice.

In terms of helping educators to gain access to computer resources the WCED should enter into an agreement with designated primary school educators to buy, on their behalf, desktop computers or notebooks (including or excluding Internet connection, laser jet printer and /or a computer scanner) and subtract a nominal amount from their salaries to recover the purchasing cost. Recommended operating systems should include Windows XP Professional, Microsoft Office XP application software and at least an Intel Pentium 4 or equivalent Celeron processor, 40GB HDD with 256MB RAM including peripherals such as a DVD or CD-ROM drive. The WCED can negotiate with computer suppliers for extended warrantees and discounts. As an incentive the WCED could subsidise the purchasing of desktop computers or notebooks up to a half of the original price on condition that educators attend computer application software training.

The Department of Library and Information Science at UWC has the necessary capacity, infrastructure and expertise to offer training (on behalf of the WCED) to designated primary school educators that lack the necessary skills and competence to use computer resources to the accomplishment of teaching related tasks. Hands-on training could focus on basic operating system and troubleshooting and how to use

Microsoft application software, specifically Word, Excel, Access and PowerPoint as well as Internet and e-mail software to the achievement of teaching related tasks. The theoretical aspects could cover the following three broad themes, namely (1) the link between computer technology and education, (2) computer application software applicable to accomplish teaching related tasks and (3) legal, ethical, human and moral issues relating to the use of computer technology in schools.

Hands-on training could be provided in the computer laboratories in the Department of Library and Information Science during the March (1 week) and June (3 weeks) school vacation from 08: 00am to 17: 30pm, including a one-hour lunch with two fifteen minutes tea break. The class ratio will be one instructor with a computer laboratory assistant to a maximum of eighteen educators. The rationale for having this class ratio is to ensure as far as possible quality hands-on training with the focus on individual attention and feedback. Carlson (2002: 9) postulates that 40 hours of professional development training is the minimum requirement for educators to acquire the above basic computer and Internet skills.

Proposed evaluation of the course (basic computer literacy for educators) could take the form of formative as well as summative assessment with the emphasis on demonstrated ability of educators to use computer technology to the accomplishment of teaching related tasks. Educators can practice and refine the skills gained from the course at their own pace and time that have access to personal computers at home. Educators could enter into an agreement with the WCED that if they fail the course, the WCED can subtract over a ten-year period the training expenditure incurred from their salaries.

After successful completion of educators' computer and Internet training, the WCED should consider the provision of a dedicated educator's room in the administration building of schools with proper infrastructure, equipment, ventilation, lighting and at least a ratio of one notebook per five educators including a print server, laser jet printer, computer scanner and a liquid crystal display (LCD) projector. These computer resources should be used exclusively for educational purposes and not for personal use.

The WCED should also consider the employment of a permanent computer administrator responsible for the maintenance of a circuit of schools' computer resources. The Western Cape Provincial Government should consider making half of the future funding made annually available to the Khanya project diverted to initiatives and projects that address the issue of capacity building especially in disadvantaged schools. This funding should be utilised for the purchasing and subsidising of designated educators' desktop computers or notebooks as well as educators' computer and Internet training.

A follow-up study should be conducted to ascertain if the increased availability of computer resources and training had any effect on educators' use of such technology to the achievement of teaching related tasks at designated primary schools. When schools obtain ICT equipment and resources for teaching and learning, it is assumed that educators who experience the benefits and confidence of using ICT in accomplishing teaching related tasks, will have a more positive attitude to be trained to use the technology as a teaching or learning tool. Ensuring that the necessary capacity is in place should precede the provision of computer laboratories to disadvantaged schools.

The second phase of the designated educators' computer training should be offered in conjunction and collaboration with the Faculty of Education at UWC that link curricular objectives to technology based activities. The emphasis of this course should be on how to use computer resources as a teaching and learning tool and the consequent pedagogical implications. Carlson (2002: 9) proposed a minimum of 80 hours of professional development for this type of training. According to Carlson (2002: 9) the World Links Teacher Professional Development programme requires 200 hours of professional development training for educators with no prior contact with computers to full competency. It should be emphasised that the use of computer technology in education is only a means to an end and not an end in itself. The success of such an initiative requires full commitment and dedication from all the stakeholders involved, including the provision of adequate resources and funding.

In conclusion, the research highlighted that individual primary schools' ability in the study area to become ICT ready are influenced by the socio-economic status of

learners attending the schools, the presence or absence of resources available in and outside the school community, which requires proactive management skills from school principals as well as the presence of proactive National and Provincial ICT policy that facilitates and addresses the needs and opportunities emerging from local school contexts.

The research highlighted that although the majority of Surrey Estate, Vanguard Estate, Welcome Estate and Heideveld primary school educators in the Cape Town suburb of Athlone have access to computers at home and to the Internet at school, the absence of adequate training for educators in the field of computer and Internet application software including limited available computer resources exclusive for educators' use at schools had a negative effect on educators' use of such technologies at schools to accomplish teaching related tasks. The ability of designated educators to use computer resources is thus influenced by two external factors, namely adequate access to computer resources as well as adequate training in their use.

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Appendices

Appendix 1

Letter of request addressed to the director of the WCED of research for permission to conduct the study at designated primary schools.

Date: .../.../2002
To: The Director
Attention: Dr Wessels
Research Department
Western Cape Education Department

Request for authorisation to conduct a survey study at the following schools for the proposed dates and time as indicated:

Schools	Proposed dates	Proposed time
Surrey Primary School	06/05/2002; 07/05/2002	14:30 – 15:30
Vanguard Primary School	08/05/2002; 09/05/2002	14:30 – 15h:30
St Theresa Primary School	13/05/2002; 14/05/2002	14:30 – 15:30
Welcome Primary School	15/05/2002; 16/05/2002	14:30 – 15:30
Heideveld Primary School	20/05/2002; 21/05/2002	14:30 – 15:30
Dagbreek Primary School	22/05/2002; 23/05/2002	14:30 – 15:30
Woodlands Primary School	27/05/2002; 28/05/2002	14:30 – 15:30
Willows Primary School	29/05/2002; 30/05/2002	14:30 – 15:30

The methods that will be used in the survey include the completion of questionnaires by all educators and interviews with principals at the above selected primary schools supervised by the researcher. The survey will be conducted after normal teaching hours, when school learners are sent home and will take approximately sixty minutes to complete.

The purpose of the study is to determine whether there is any link between the designated primary school educators' computer and Internet access and training, and the extent to which such technologies are utilised for accomplishing teaching related tasks. These tasks include using the computer to create instructional materials such as

worksheets and tests; for administrative record keeping such as progress reports and attendance register; to access information via CD-ROM off-line and the Internet online for best practice teaching, model lesson plans, e-mail communication and web publishing.

The study forms part of my Master's Thesis in the Department of Library and Information Science under the supervision of Prof. G.H. Fredericks. To ensure confidentiality and anonymity the name of schools and educators will not be associated with the result of this report. Participation of educators and principals will be voluntary. I need your help in conducting this survey. Could you encourage all educators and principals at selected primary schools to participate in this survey? I would greatly appreciate your help in this area. The results of this study will be made available to respondents on request.

Sincerely
E. Omar

.....

E-mail address: eomar @ uwc.ac.za
Telephone number: 959-2137/3547
Fax number: 9593659

Appendix 2

Permission letter received from the WCED for the survey research to be conducted at designated primary schools

Navrae / Enquiries / IMibuzo: Dr Frances J Wessels

Telefoon / Telephone / IFoni: 425 7400 ext 2238

Faks / Fax / IFeksi: 425 7445

Verwysing / Reference / ISalathiso: 20020416-0015

Wes-Kaap Onderwysdepartement

Western Cape Education Department

ISebe leMfundo laNtshona Koloni

Mr E Omar
University of the Western Cape
Private Bag X17
BELLVILLE
7535

Dear Sir

RESEARCH PROPOSAL: EDUCATORS' ACCESS, TRAINING AND USE OF COMPUTER-BASED TECHNOLOGY AT SELECTED PRIMARY SCHOOLS IN THE ATHLONE AREA

Your application to conduct the above-mentioned research at learning sites in the Western Cape has been approved subject to the following conditions:

1. Principals, educators and learners are under no obligation to assist you in your investigation.
2. Principals, educators, learners and learning sites should not be identifiable in any way from the results of the investigation.
3. You make all the arrangements concerning your investigation.
4. Educators' programmes are not to be interrupted.
5. The investigation is to be conducted from 06 May 2002 to 29 May 2002.
6. Should you wish to extend the period of your survey at the schools, please contact F Wessels at the contact numbers above.
7. The investigation is not conducted during the fourth school term.
8. A photocopy of this letter is submitted to the principal of each school where the intended research is to be conducted.
9. Your research will be limited to Surrey Primary; Vanguard Primary; St Theresa Primary; Welcome Primary; Heldeveld Primary; Dagbreek Primary; Woodlands Primary and Willows Primary School.
10. A brief summary of the content, findings and recommendations is provided to the Director: Research.
11. The Department receives a copy of the completed report/dissertation/thesis addressed to:

    The Director: Research
    Western Cape Education Department
    Private Bag 9114
    CAPE TOWN
    8000

We wish you success in your research.
Kind regards.

F Wessels

pp **ACTING HEAD: EDUCATION**
DATE: 22/04/2002

MELD ASSEBLIEF VERWYSINGSNOMMERS IN ALLE KORRESPONDENSIE / PLEASE QUOTE REFERENCE NUMBERS IN ALL CORRESPONDENCE / NCEDA UBHALE IINOMBOLO ZESALATHISO KUYO YONKE IMBALELWANO

Appendix 3

Letter of request addressed to primary school principals for permission to conduct a survey research at their respective schools.

To: The Principal of .....

From: E. Omar

Re: Survey Research

Date: .....

I am a registered M Bibl student within the Department of Library and Information Science at the University of the Western Cape and have received permission from the Western Cape Education Department to conduct a survey at your school.

The methods that will be used in the survey include the completion of questionnaires by all educators and an interview with the principal of the primary school supervised by the researcher. The survey will be conducted after normal teaching hours, when school learners are sent home and will take approximately sixty minutes to complete.

The purpose of the study is to determine whether there is any link between the designated primary school educators' computer and Internet access and training, and the extent to which such technologies are utilised for accomplishing teaching related tasks. These tasks include using the computer to create instructional materials such as worksheets and tests; for administrative record keeping such as progress reports and attendance registers; to access information via CD-ROM off-line and the Internet online for best practice teaching, model lesson plans, e-mail communication and web publishing.

This study is confidential. No individual responses will be revealed. I need your help in conducting this survey. Could you encourage all educators at the school to participate in this survey? I would greatly appreciate your help in this area. It will be appreciated if the survey can be conducted on the ..... at .....
The results of this study will be made available to respondents on request.

Sincerely

E. Omar

Appendix 4

Letter of motivation addressed to primary school educators to participate in the survey research.

To: School Educators at .....

From: E. Omar

Re: Survey Research

Date: .....

I am a postgraduate student within the Department of Library and Information Science at the University of the Western Cape and have received permission from the Western Cape Education Department to conduct this survey and your principal has been notified of my efforts.

The purpose of the study is to determine the extent to which primary school educators have access, training and use of computer(s) and the Internet to accomplishment of teaching related tasks. With increasing expectancy of educators to be computer literate (see attachment), it is important for professional staff developers to know what factors influence educators' choice to use or not to use computer-based technology for accomplishing teaching related tasks. The results of this study will provide direction for interested parties to develop guidelines for the types of access and training, which are most successful in influencing educators' use of computer-based technology for the accomplishment of teaching related tasks.

The methods that will be used in the survey include the completion of questionnaires by all educators supervised by the researcher. The survey will be conducted after normal teaching hours, when school learners are sent home and will take approximately sixty minutes to complete. This study is confidential. No individual responses will be revealed. Your participation would be greatly appreciated. The survey will be conducted on the ..... at ..... The results of this study will be made available to respondents on request.

Sincerely

E. Omar

Attachment

ISTE computer competencies and skills guideline.

The International Society for Technology in Education (ISTE), which provides a framework for technology standards applicable to educational settings, adopted in 1993 in its first edition thirteen technology standards and performance indicators for educators. According to these indicators, all educators should be able to perform the following tasks:

1. Operate a computer system in order to use software successfully;
2. Evaluate and use computers and other related technologies to support the instructional process;
3. Apply current instructional principles, research and appropriate assessment practices to the use of computers and related technologies;
4. Explore, evaluate, and use computer technology-based materials;
5. Demonstrate knowledge of uses of computers for problem-solving, data collection, information management, communications presentations, and decision-making;
6. Design and develop student learning activities that integrate computing and technology for a variety of student grouping strategies and for diverse student populations;
7. Evaluate, select, and integrate computer technology-based instruction in the curriculum of one's subject area(s) and/or grade level(s);
8. Demonstrate knowledge of multimedia, hypermedia, telecommunications activities to support instruction;
9. Demonstrate skill in productivity tools for professional and personal use, including word-processing, database, spreadsheet, and print/graphics utilities;
10. Demonstrate knowledge of equity, ethical, legal, and human issues of computing and technology;
11. Identify resources for staying current in applications of computing and related technologies in education;
12. Use computer-based technologies to access information to enhance personal and professional productivity;

13. Apply computers and related technologies to facilitate emerging roles of the learner and the educator.

In 1997 the ISTE published the second edition of technology standards for all educators, which contained 18 indicators divided into the following three categories, namely:

1. Basic computer/technology operations and concepts;
2. Personal and professional use of technology;
3. Application of technology in instruction.

The third edition of ISTE-National Educational Technology Standards for Teachers published in 2000, contained 23 indicators, organize into the following six categories, namely:

1. Technology operations and concepts;
2. Planning and designing learning environments and experiences;
3. Teaching, learning, and curriculum;
4. Assessment and evaluation;
5. Productivity and professional practice;
6. Social, ethical, legal and human issues.

Source

International Society for Technology in Education (ISTE). 2001. **National Educational Technology Standards for Teachers: Technology Standards and Performance Indicators for Teachers.** [Online]. Available: http://cnets.iste.org/index3.html. [site visited 23 January 2002].

Computer competencies in the South African school curriculum.

In South Africa, the Draft Revised National Curriculum Statement for Grades R-9 release for public comment in July 2001 included Information Communication Technology (ICT) as one of three strands used to organise content in the Technology learning area. It is envisaged that under the ICT strand schools, where possible, should develop the following skills:

- **Word processing** (skill needed by all learning areas);
- **Spread sheets** (skill needed mostly by Mathematics and Economic and Management Sciences);
- **Database** (skill needed mostly by Social Sciences, and Economic and Management Sciences);
- **Graphics** (skill needed mostly by Arts and Culture, Technology and Social Sciences);
- **CD-ROM** referencing (needed by all learning areas);
- **Internet** (needed by all learning areas);
- **E-mail**, chat forums and the development of mailing lists (needed by all learning areas).

Implications for South African primary and secondary school educators are the following:

- All educators should be competent in ICT application in their learning areas in order to develop and maximise learners' skills in ICT application and to use ICT as a tool to improve learners' academic achievement. This aspect of ICT can only be realised if educators are trained and prepared in ICT use and application as well as an understanding of the pedagogical implications using this technology for teaching and learning and can only be offered to learners where schools have the necessary resources and equipment.

Source

South Africa (Republic). Department of Education. 2001. **Draft Revised National Curriculum Statement.** Pretoria: Department of Education. [Online]. Available: http://education.pwv.gov.za/DoE_Sites/Curriculum/New_2005/draft_revised_national_curriculu.htm [site visited 30 November 2001].

Appendix 5

Survey questionnaire

EDUCATOR COMPUTER & INTERNET USE STUDY

Dear educators, your participation in this survey will be greatly appreciated for my research on Surrey Estate, Heideveld, Vanguard Estate and Welcome Estate primary school educators' access to, training and use of computers and the Internet to the accomplishment of teaching related tasks and is strictly voluntary. By co-operating, you will help me find answers to important questions. Confidentiality is guaranteed, your name will not be associated with your answers in any public or private report of these results. Results of this study will be made available upon request

Instructions

Your response should be based on your experience.

Please answer all questions as best as you can. Please use a dark pencil

Section I: Demographics

1) **My age is:**

---

2) **Gender?** (Cross one)

--------- a. Male --------- b. Female

3) **My highest education qualification is:** (Cross one)

--------- a. Std. 8 + teaching diploma --------- b. Std. 10 + 1 year teaching diploma

--------- c. Std. 10 + 2 years teaching diploma --------- d. Std. 10 + 3 years teaching diploma

--------- e. Std. 10 + 4 years teaching diploma --------- f. Bachelor + (H.E.D.)

--------- g. B. Ed --------- h. M. Ed

---------i. Other please specify

4) **Number of years teaching?**

---

5) **My first language is:** (Cross one)

--------- a. Afrikaans --------- b. English --------- c. Xhosa

d. Other language. Please specify ----------

Section II: Current computer and Internet skills & Training

6) **Assessment of your current computer & Internet skills.**

(Cross **I do not know** or **Little** or **Basic** or **Advanced** for each skill)

I know how to:

Skills	I do not know	Little	Basic	Advanced
6.1) Create a new database. (e.g. using MS Access)	a.	b.	c.	d.
6.2) Use spreadsheets. (e.g. using MS Excel)	a.	b.	c.	d.
6.3) Use word processing. (e.g. using MS Word, WordPerfect etc.)	a.	b.	c.	d.
6.4) Use Internet search engines.	a.	b.	c.	d.
6.5) Use information resources (e.g. using CD- ROM encyclopaedia)	a.	b.	c.	d.
6.6) Use e-mail	a.	b.	c.	d.
6.7) Use web publishing (e.g. using MS FrontPage, Notepad HTML etc.)	a.	b.	c.	d.

7) **To what extent has each of the following prepared you to use word-processing software?**

(Cross **None** or **Seldom** or **Frequent** for each training item)

Training	None	Seldom	Frequent
7.1) College/University work.	a.	b.	c.
7.2) Computer courses taken at private training institutions.	a.	b.	c.
7.3) Learn/teach myself to use word-processing software.	a.	b.	c.
7.4) My previous work experience outside teaching.	a.	b.	c.
7.5) Friends	a.	b.	c.

7.6) Other place/s, please specify and extent (none, seldom or frequent)

---

8) **To what extent has each of the following prepared you to use Spreadsheet software?**

(Cross **None** or **Seldom** or **Frequent** for each training item)

Training	None	Seldom	Frequent
8.1) College/University work.	a.	b.	c.
8.2) Computer courses taken at private training institutions.	a.	b.	c.
8.3) Learn/teach myself to use spreadsheet software.	a.	b.	c.
8.4) My previous work experience outside teaching.	a.	b.	c.
8.5) Friends	a.	b.	c.

8.6) Other place/s, please specify and extent (none, seldom or frequent)

---

9) **To what extent has each of the following prepared you to use Database software?**

(Cross **None** or **Seldom** or **Frequent** for each training item)

Training	None	Seldom	Frequent
9.1) College/University work.	a.	b.	c.
9.2) Computer courses taken at private training institutions.	a.	b.	c.
9.3) Learn/teach myself to use database software.	a.	b.	c.
9.4) My previous work experience outside teaching.	a.	b.	c.
9.5) Friends	a.	b.	c.

9.6) Other place/s, please specify and extent (none, seldom or frequent)

---

10) **To what extent has each of the following prepared you to use CD-ROM software?**

(Cross **None** or **Seldom** or **Frequent** for each training item)

Training	None	Seldom	Frequent
10.1) College/University work.	a.	b.	c.
10.2) Computer courses taken at private training institutions.	a.	b.	c.
10.3) Learn/teach myself to use CD-ROM software.	a.	b.	c.
10.4) My previous work experience outside teaching.	a.	b.	c.
10.5) Friends	a.	b.	c.

10.6) Other place/s, please specify and extent (none, seldom or frequent)

---

11) **To what extent has each of the following prepared you to use Internet search engines?**

(Cross **None** or **Seldom** or **Frequent** for each training item)

Training	None	Seldom	Frequent
11.1) College/University work.	a.	b.	c.
11.2) Internet courses taken at private training institution/s.	a.	b.	c.
11.3) Learn/teach myself to use Internet search engines.	a.	b.	c.
11.4) My previous work experience outside teaching.	a.	b.	c.
11.5) Friends	a.	b.	c.

11.6) Other place/s, please specify and extent (none, seldom or frequent)

---

12) **To what extent has each of the following prepared you to use e-mail?**

(Cross **None** or **Seldom** or **Frequent** for each training item)

Training	None	Seldom	Frequent
12.1) College/University work.	a.	b.	c.
12.2) E-mail courses taken at private training institutions.	a.	b.	c.
12.3) Learn/teach myself to use e-mail.	a.	b.	c.
12.4) My previous work experience outside teaching.	a.	b.	c.
12.5) Friends	a.	b.	c.

12.6) Other place/s, please specify and extent (none, seldom or frequent)

---

13) **To what extent has each of the following prepared you to use web-publishing?**

(Cross **None** or **Seldom** or **Frequent** for each training item)

Training	None	Seldom	Frequent
13.1) College/University work.	a.	b.	c.
13.2) Web publishing courses taken at private training institutions.	a.	b.	c.
13.3) Learn/teach myself to use web publishing.	a.	b.	c.
13.4) My previous work experience outside teaching.	a.	b.	c.
13.5) Friends	a.	b.	c.

13.6) Other place/s, please specify and extent (none, seldom or frequent)

---

14) **If the WCED buys a computer (including or excluding) Internet connection and a printer on your behalf and subtracts R30.00 from your salary per month in order to recover the purchasing cost, would you agree to such an arrangement?**

(Cross Yes or No)

--------- a. Yes --------- b. No

15 **If you answer "No" to 14 above please cross the appropriate reason/s and/or specify.**

Reasons	Cross here
15.1) I already have a computer.	a.
15.2) Too much money is being subtracted.	b.
15.3) I am not interested in computers.	c.

15.4) Other reason/s, please specify

---

16) **Would you be prepared to attend free courses, if offered by the WCED that will allow you to use computer technology for the following?**

(Please cross appropriate application/s)

Applications	Cross here
16.1) As a tool for information acquisition and web publishing. (CD ROM & Internet search)	a.
16.2) Word processing, Spreadsheet and Database software application in Education.	b.
16.3) Teach computer literacy.	c.
16.4) As a teaching & learning tool in all subjects	d.
16.5) Communication (using e-mail to communicate with colleagues, parents and students)	e.

Section III: Computer & Internet access

17) **Do you have access to a personal computer?** (Access refers here to the availability not necessarily the use of computers)

(Cross Yes or No)

--------- a. Yes --------- b. No

18) **If you answer "No" to 17 above please specify reason/s.**

---

19) **If you answer "Yes" to 17 above, where do you have access to a personal computer?**
(Please cross appropriate place/s and/or specify.)

Place	Cross here
19.1) Home	a.
19.2) School	b.
19.3) Friend's house	c.

19.4) Other place/s, please specify

---

20) **Do you have access to the Internet?** (Refers to availability not necessarily the use of the Internet)
(Cross Yes or No)
--------- a. Yes --------- b. No

21) **If you answer "No" to 20 above please specify reason/s.**

---

22) **If you answer "Yes" to 20 above, where do you have access to the Internet?**
(Please cross appropriate place/s and/or specify.)

Place	Cross here
22.1) Home	a.
22.2) School	b.
22.3) Friend's house	c.

22.4) Other place/s, please specify

Section IV: Computer & Internet use

23) **Do you use a personal computer to accomplish teaching related tasks?**

Cross Yes or No)

--------- a. Yes --------- b. No

24) **If you answer "No" to 23 above please cross the appropriate reason/s and/or specify.**

Reasons	Cross here
24.1) I cannot afford to buy me a computer.	a.
24.2) I do not see the value/benefits of computer application in my teaching.	b.
24.3) I am not computer literate.	c.

24.4) Other reason/s, please specify

---

25) **If you answer "Yes" to 23 above, where do you use the personal computer?**

(Please cross appropriate place/s and/or specify)

Place	Cross here
25.1) Home	a.
25.2) School	b.
25.3) Friend's house	c.

25.4) Other place/s, please specify

---

26) **How often do you use the computer for accomplishing the following teaching related tasks?**

(Cross once for each professional activity and/or specify.)

Professional activities	Not at all	Daily	Weekly	Monthly	Twice a year
26.1) Create instructional material. (e.g. tests, worksheets)	a.	b.	c.	d.	e.
26.2) Administrative record keeping. (e.g. attendance, reports)	a.	b.	c.	d.	e.
26.3) Access information via CD ROM software.	a.	b.	c.	d.	e.

26.4) Other professional teaching activity/ies, please specify and the extent (Not at all, Daily, Weekly, Monthly or Twice a year).

---

27) **Do you use the Internet to accomplish teaching related tasks?**

(Cross Yes or No)

--------- a. Yes --------- b. No

28) **If you answer "No" to 27 above please cross appropriate reason/s and/or specify.**

Reasons	Cross here
28.1) I cannot afford the Internet subscription.	a.
28.2) I do not see the value/benefits of Internet application in my teaching.	b.
28.3) I am not Internet literate.	c.

28.4) Other reason/s, please specify

---

29) **If you answer "Yes" to 27 above, where do you use the Internet?**

(Please cross appropriate place/s and/or specify.)

Place	Cross here
29.1) Home	a.
29.2) School	b.
29.3) Friend's house	c.

29.4) Other place/s, please specify

---

30) **How often do you use the Internet for accomplishing the following teaching related tasks?**

(Cross once for each professional activity and/or specify.)

Professional activities	Not at all	Daily	Weekly	Monthly	Twice a year
30.1) Gather information for lesson planning.	a.	b.	c.	d.	e.
30.2) Access model lesson plans.	a.	b.	c.	d.	e.
30.3) Access research and best practice teaching.	a.	b.	c.	d.	e.
30.4) Access information & resources to use in the classroom.	a.	b.	c.	d.	e.
30.5) Sending/receiving E - mails to/from (e.g. colleagues, parents)	a.	b.	c.	d.	e.

30.6) Other professional teaching activity/ies, please specify and the extent (Not at all, Daily, Weekly Monthly or Twice a year).

Section V: Access to a computer printer and/or computer scanner

31) **Do you have access to a computer printer?**

(Cross Yes or No)

--------- a. Yes --------- b. No

32) **If you answer "Yes" to 31 above, where do you have access to a computer printer?**

(Please cross appropriate place/s and/or specify.)

Place	Cross here
32.1) Home	a.
32.2) School	b.
32.3) Friend's house	c.

32.4) Other place/s, please specify

---

33) **If you answer "No" to 31 above please specify reason/s**

---

34) **Do you have access to a computer scanner?**

(Cross Yes or No)

--------- a. Yes --------- b. No

35) **If you answer "Yes" to 34 above, where do you have access to a computer scanner?**

(Please cross appropriate place/s and/or specify.)

Place	Cross here
35.1) Home	a.
35.2) School	b.
35.3) Friend's house	c.

35.4) Other place/s, please specify

---

36) **If you answer "No" to 34 above please specify reason/s**

This is the end of the survey questionnaire. Thank you very much for your effort and input. Once again, your participation is greatly appreciated.

Appendix 6

Interview schedule

Interview questions put to school principals

General

1. In which year was the school established?
2. Describe the socio-economic condition of the area the school is serving?
3. How would you characterise parents' contribution towards school fees?
4. Does the school have regular fundraising activities during the year?
5. Explain the school's anticipated (a) income, (b) expenditure and (c) financing of resources for the current year.

Computers at school

6. Does the school have a computer technology plan? Please explain.
7. Does the school use computer resources for:
   (a) Administration purposes?
   (b) Teaching & learning purposes?
   (c) Educators' use?
8. If Yes. Describe how the school uses computer resources, which it has? That is:
   - Who uses them?
   - In what way are they used?
9. How was the acquisition of the computer resources financed?
10. Who is responsible for (a) managing the computer resources and (b) their use at the school?
11. How effectively do you feel the school is using the computer resources, which it has? Give reasons for your answers.
12. What in your opinion have been the main hindering factors to (a) provision and (b) use of computer resources in the school?
13. How do you see the school overcoming these hindering factors in the future?
14. What do you see the role of (a) Provincial and (b) National Education Department as being in relation to computer resources use in the school?

Source

Lundall, P. & Howell, C. 2000. **Computers in schools: a national survey of Information Communication Technology in South African schools**. Bellville: University of the Western Cape, Education Policy Unit.