

## CHAPTER 1

### GENERAL ORIENTATION TO THE STUDY

#### 1.1 INTRODUCTION

Asmal (1999:3) states that the engagement of educators with Information and Communication Technology (ICT) represents an important part of the South African government's strategy to improve the quality of teaching and learning across the education and training system. In the draft White Paper on e-Education (Department of Education, 2003:10) it is stated that the government's policy goal is to achieve the harmonious and widespread insertion and use of ICT into the South African education system so that *“by 2013 every South African learner in the general and further education and training bands will be ICT capable.”*

There are several national and international organizations that support the engagement of educators with ICT integration in schools. The leading one is the International Society for Technology (ISTE), which promotes computer-supported learning (Shelly, Cashman, Gunter & Gunter, 1999:18). There is an overwhelming awareness of the great potential in the utilisation of computers in the classroom to promote development of educators and alleviate some of the problems in the education system. Through government and private initiatives, South Africa has embarked on a national programme on technology education in all provinces particularly ICT integration into teaching and learning. Initiatives taken by other organizations in different countries will be discussed in chapter 2.

This chapter will present the motivation of the study and the problem statement, which will be justified. The aim and objectives will also be outlined, then the research design explained in brief. Finally, the plan of the study, followed by the summary, will conclude the chapter.

## 1.2 RATIONALE AND MOTIVATION

It has been my observation that new technologies such as computers are being introduced in schools and that computer literacy and computer skills are treated as 'new subjects' in many cases. Time for computer skills training is added to the learners' timetable at most of the Ga-Rankuwa secondary schools that I have access to, and computer activities are seldom utilised for teaching and learning in the classroom. As a result of my contact with a few Ga-Rankuwa secondary school educators, whose schools have been using computers for a number of years, I came to realise that they do not enjoy the maximum benefits of the technology because they are not integrating ICT into teaching and learning, but are merely teaching computer skills. According to Cornu (1996:3) this practice is time consuming and too demanding for educators. My preliminary research also revealed the scenario outlined in this paragraph to be typical of what pertains to most Ga-Rankuwa secondary schools with computer facilities.

A quotation from a speech by the Minister for Education Kader Asmal (1999:15) given at the Millennium Minds School Computing Conference held in Cape Town, highlights the need for increased engagement by educators with ICT for teaching and learning purposes: *"We must do more than put computers in schools; we must empower educators to use them effectively and share what they have learnt"*. It is clear from Asmal's words that engagement of educators with ICT has been seen as a key factor in the transformation of education in South Africa. The draft White Paper on e-Education (Department of Education, 2003:4) indicates that significant progress has already been made in provincial implementation of ICT by the government with projects such as Khanya in the Western Cape, GautengOnline in Gauteng and Connectivity Project in the Northern Cape.

However, whilst these government initiatives are being implemented, an increasing number of secondary schools in Ga-Rankuwa have also secured computers from different companies with an interest in education. Some of these companies such as *Intel® Teach to the Future* have gone the extra mile

to engage educators in the effective use of computers, especially in the classroom. Asmal (1999:13) adds, “*We can put technology in classrooms but without committed, trained educators, this technology will be of no value*”. It was only in January 2003, in response to the call by the former Minister for Education to engage educators with ICT, that *Intel® Teach to the Future* (the focus of this study) was introduced to Ga-Rankuwa educators in order to enhance their technological approach to teaching and learning.

Currently, educators have many unanswered questions about their engagement with ICT integration into teaching and learning. While some educators are experimenting enthusiastically with this dynamic medium of learning, others are wary of such unfamiliar technology. Unfortunately, according to Bitter (1998:75), in some cases computers are unused or underused in some schools because of this confusion. Bitter explains that to ensure that computers are used for effective integration into teaching and learning, engagement of educators with ICT should to be conducted in a face-to-face situation at the project schools.

In the process of engaging educators with the integration of ICT into teaching and learning, an educator is identified as an agent of change, who plays a pivotal role in the teaching and learning process (Cornu, 1996:12). In addition, Hooper and Hokanson (2000:138) state that learning is an active process, which involves learners using their current knowledge to create new ideas and concepts. By developing effective mental models of particular concepts, learners can go beyond what they already know. The role of an educator as a change agent is to facilitate learners' discovery of principles for themselves. An educator needs to select the appropriate material to match the current state of knowledge of a learner and to present it in such a way that will excite interest and stimulate the motivation to discover more. For the learners to be ICT capable, educators need to engage each learner actively in a process of discovery that is appropriate to their needs, and this could be much easier if educators are also engaged with ICT integration into teaching and learning.

From a search through the NEXUS database of current and completed research in South Africa, there seems to be no documented research about the influence of private initiatives on the engagement of educators with computers during the uptake of ICT.

### **1.3 STATEMENT OF THE PROBLEM**

At the core of the South African government's project to improve teaching and learning opportunities for learners, lies the engagement of educators with ICT integration into teaching and learning by Provincial Departments of Education, *Telkom*, as well as parastatal organizations and other private initiatives. My concern is that there are a number of private initiatives, such as *Intel® Teach to the Future* that have designed programmes intended to assist educators in the integration of ICT into teaching and learning but there is, insufficient documented evidence of how private initiatives influence the engagement of educators with ICT. Even though in some schools educators are engaged with ICT training, it appears that some are not implementing what they have learnt at these training sessions. From personal conversation with one of my colleagues who received training in ICT integration from *Intel®*, minimal impact has been registered because she lacked basic computer skills. Whilst other educators were concentrating on refining teaching skills using ICT at the training, she was forced to concentrate on mastering basic skills. This phenomenon is also observable in two of the three schools visited where only one school was using computers in teaching and learning and the other two schools were teaching computer literacy. *Intel®*'s influence on the integration of ICT into the teaching and learning process at schools should therefore be investigated

### **1.4 RESEARCH QUESTION**

The major research question to be answered by this research project is:

*How do private initiatives influence the engagement of educators during the uptake of Information and Communication Technology (ICT) in selected Ga-Rankuwa secondary schools?*

In order to answer the above question it will be necessary to find answers to the following sub-questions.

- How do educators engage with computers during the training programme organised by a private initiative?
- What artifacts are produced by educators during the training programme?
- Does the private initiative influence the educators' ability to function effectively in modern society?

## **1.5 AIMS AND OBJECTIVES**

The inquiry aims to determine how a private initiative influences the engagement of educators with ICT in three selected Ga-Rankuwa secondary schools.

Objectives include:

- capturing the engagement of educators with computers at selected Ga-Rankuwa secondary schools;
- analysing artifacts (products) produced by educators in order to further gauge their level of engagement with ICT;
- establishing educators' perceptions on whether or not their exposure to the private initiative influenced their ability to function effectively as educators in modern society.

A review of the most relevant literature will provide a theoretical background for the study. To do this it will be necessary to:

- identify trends in ICT uptake in schools;
- position this study within the South African context;
- identify government and private initiatives involved with ICT uptake in South Africa.

## 1.6 RESEARCH DESIGN

A qualitative research design was used in this study. This method usually takes place in natural situations, which exhibit control, behaviors and settings (Lancy, 1997:67). Qualitative research emphasises understanding verbal narratives (Mostert, 2000:30). The researcher will be talking and listening to other people in order to gather information. Bogdan and Biklen (1996:140) explain that one of the characteristics of qualitative research is that it demands that the world be approached with the assumption that nothing is trivial, that everything has the potential of being a clue that might unlock a more comprehensive understanding of what is being studied.

## 1.7 RESEARCH METHODOLOGY

The research genre of this study is a hybrid of ethnography and a case study. The case study is a way of organising social data and looking at the object to be studied as a whole. Henning, Van Rensburg and Smit (2004:40) explain that it is characterised by the focus on a phenomenon that has identifiable boundaries. According to Merriam (quoted in Henning et al. 2004:41) a case study design is employed to gain an in-depth understanding of the situation and meaning for those involved. On the other hand ethnographies are not characterised by their boundaries alone, but try to capture the way of life within a group. In this inquiry getting to know the engagement of educators with ICT would entail more than just interviewing them. The researcher had to join them for a period of time to observe their engagement with ICT in action. She also gained an in-depth understanding of the role of *Intel® Teach to the Future* in the integration of ICT, concentrating on a selected group of educators from Ga-Rankuwa secondary school. The description of how

training takes place, 'where', 'when' and 'why' was noted and formed an important part of the study.

## **1.8 DATA COLLECTION TECHNIQUES**

Qualitative researchers depend on a variety of methods for gathering data. Clesne and Peshkin (1998:24) state that the use of multiple-data-collection methods contributes to the trustworthiness of the data. They further explain that this practice may also involve the incorporation of multiple investigators in order to increase confidence in research findings. In this study the researcher was the only investigator. This study used observations, interviews and document analysis. According to Henning et al. (2004:6) these three data collection techniques are the main categories of data collection methods in qualitative research.

### **1.8.1 Observation**

Participatory observation in this study was used, because in order to answer the 'how' 'where' and 'why', the researcher had to join the educators at the training center as a trainee and visit three schools.

### **1.8.2 Interviews**

The researcher conducted a single focus group interview with selected Ga-Rankuwa educators, representing different learning areas. The purpose was to gather information on the engagement of educators during the uptake of ICT. The interview was audio recorded and the recordings later transcribed.

### **1.8.3 Document analysis**

According to Henning at al. (2004:99), documents and other artifacts are a valuable source of information and if they are available they should be used in the design. Documents such as participants' portfolios were of value to the researcher. Documents created by educators during the *Intel*<sup>®</sup> ICT integration

training were collected, compared and analysed in order to gauge educators level of engagement with computers.

## **1.9 DATA ANALYSIS**

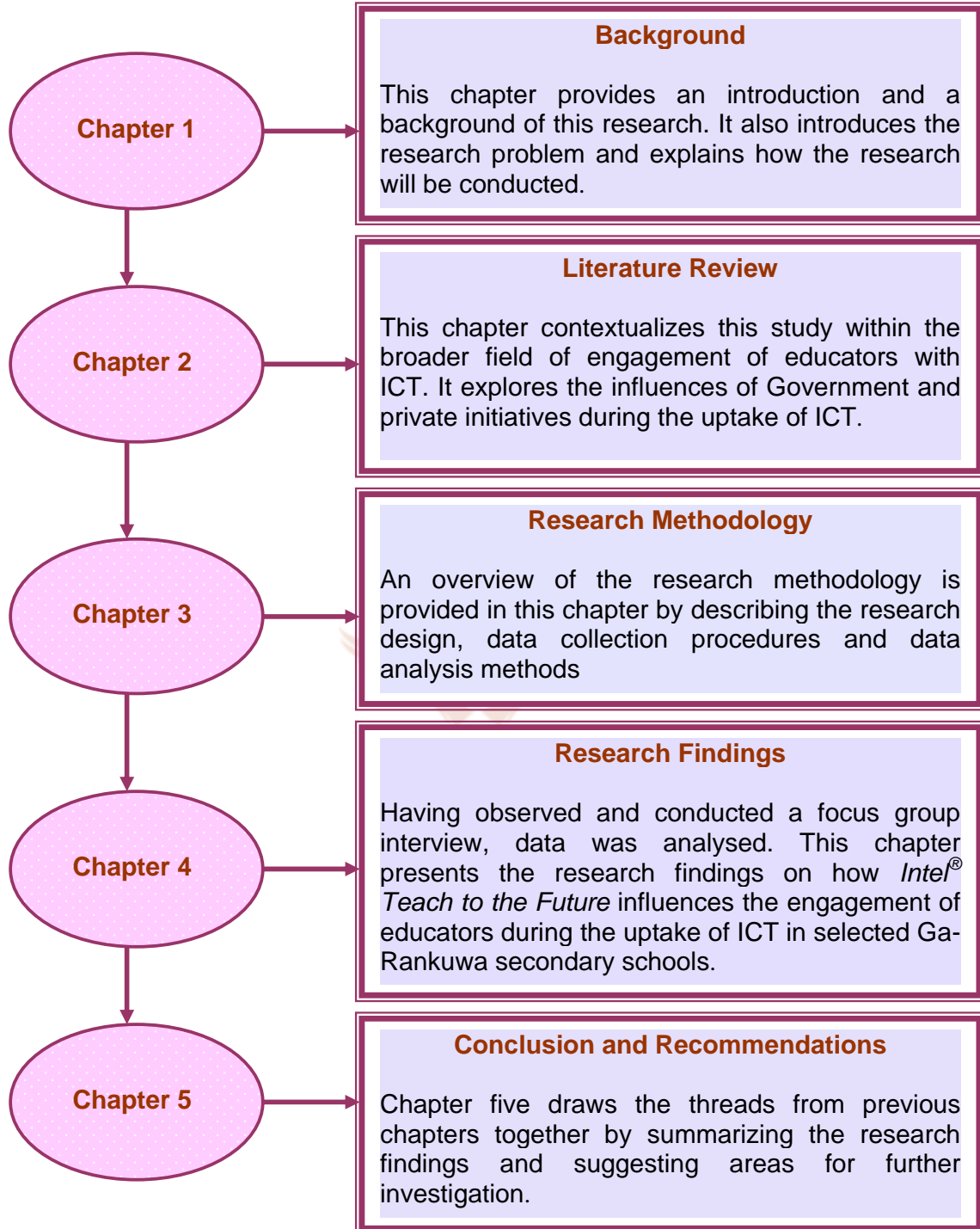
Henning et al. (2004:131) state that open coding refers to naming and categorising phenomena through close examination of the data. Henning et al.'s approach to open coding was applied. Data was collected and analysed. It was then broken down into discrete parts, which were compared and similar incidents were categorised or grouped together and given the same conceptual label.

An overview of the rest of this mini-dissertation can be found on the following page.





## 1.10 STRUCTURE OF THE RESEARCH



**Figure 1.1** The structure of the research report

## 1.11 ETHICAL STATEMENT

In the execution of this study, the ethical requirements as set out by Rand Afrikaans University's Faculty of Education and Nursing will be taken into account. Adhering to the following will ensure objectivity and integrity:

- The necessary permission will be obtained from Institutional Support Coordinator and three (3) participating Ga-Rankuwa secondary schools. Refer to Appendix B for application and F for permission granted.
- Participants will be at liberty to withdraw from the study at any time, without any pressure to provide reasons. See Appendix C.
- All possible means will be undertaken to ensure that participants are not caused any detriment by partaking in this study and a pseudonym will be accordingly allocated to all participants to protect identities and to guarantee that any information revealed, either personal or professional, will be regarded as absolutely confidential.
- Acknowledgment will be made of any shortcomings in the study.
- Presentation of data will be just and accurate.

## 1.12 SUMMARY

In this introductory chapter, a brief orientation to the study is provided, stating clearly the problem to be investigated. The major focus of this study is to find out how *Intel® Teach to the Future* influences the engagement of selected Ga-Rankuwa secondary educators with ICT. The next chapter will review the literature on the influence of private and government initiatives on the engagement of educators with ICT integration into teaching and learning worldwide and locally.

## CHAPTER 2

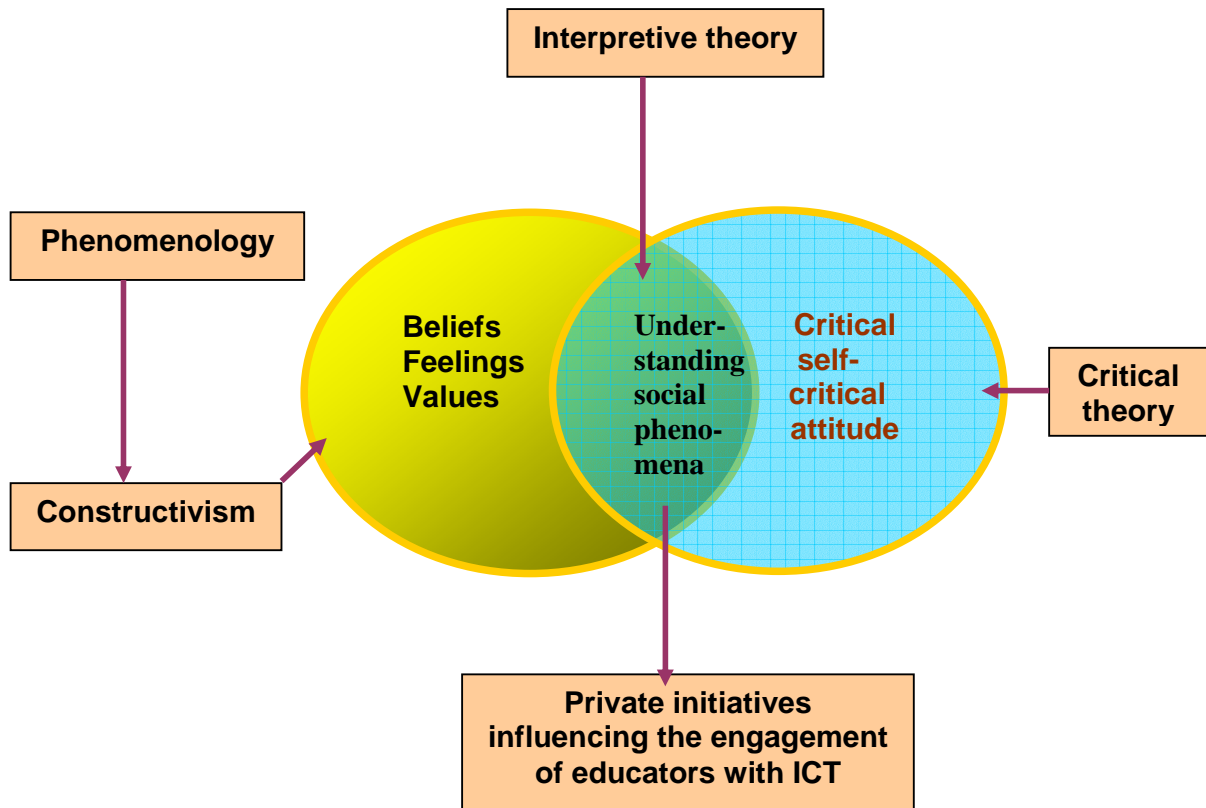
### GOVERNMENT AND PRIVATE INITIATIVES INVOLVED WITH ICT WORLDWIDE

#### 2.1 INTRODUCTION

Bell and Opie (2002:91) state that any investigation involves reading what other people have written about their area of interest. The researcher gathers information and supports or refutes his/her arguments. According to Henning et al. (2004:27) there are three places where a literature review is used: in the contextualisation of a study to argue a case, in research where the researcher essentially initiates a conversation with literature, and in the analysis of data. The aim of this chapter is to review literature on how educators are engaged with ICT integration worldwide as well as locally. In this chapter ICT uptake worldwide as well as in South Africa will be discussed.

#### 2.2 THEORETICAL FRAMEWORK

As this research endeavors to understand the influence of *Intel® Teach to the Future* on the engagement of educators with ICT in selected Ga-Rankuwa secondary schools, an interpretivist, qualitative design is followed. According to Henning et al. (2004:16) the verb 'understand' assumes an interpretivist theoretical paradigm, i.e, one that seeks to produce descriptive analysis that emphasises deep, interpretive understanding of social phenomena. This study is, however, informed by a number of theories as can be seen in fig 2.1



**Figure 2.1** A theoretical framework informed by various theories

This study is partially guided by the principles of both *interpretive* and *critical* theory but not restricted by them. My constructivist view also acknowledges human beliefs, feelings and values as characterised under the phenomenological research paradigm. My research therefore may be informed by many different theories. For personal change to be truly transformational, it is also assumed that all participants in this study will adopt a critical and self-critical attitude. Only then will this research provide an honest account of how private initiatives influence the engagement of educators with ICT.

### 2.3 THE IMPORTANCE OF ICT IN SCHOOLS

Many reasons have been presented for introducing ICT in schools. Morrison, Lowther and Demeulle (1999:18) state that when used appropriately, ICT has the potential to enhance learners' achievement and assist them in meeting learning objectives. In addition, Shelly, Cashman, Gunter and Gunter

(1999:13) explain that computers can provide many unique, effective and powerful opportunities for teaching and learning. These opportunities include skill-building practice, real world problem solving, interactive learning, discovery learning and linking learners to instructional resources. According to Forcier (1999:22), computers support communication beyond classroom walls. Computers enable schools and communities to provide an environment for cooperative learning, development of high-order thinking skills and for solving complex problems. As demonstrated by these examples, computers, when placed in the hands of teachers and learners, can provide different types of instruction and learning. Hawkridge, Jaworki and Machon (1990:13) describe four rationales of computers in education, viz: the social, vocational, pedagogical and catalytic rationales.

The first, the *social rationale*, involves making students aware of the importance of computer literacy and how computers work. Computers pervade society and therefore students should know how to use them and should not have a fear of them. The second is the *vocational rationale*: the essence here is the role that computers can play in learners' careers. For example, students who are taught programming may develop skills that may be useful in their jobs. The *pedagogical rationale*, which is the third rationale, is a justification of the use of computers in learning other subjects. Computer-assisted learning may be used if it offers advantages over other methods of learning. The fourth and last of Hawkridge's rationales is the *catalytic rationale*: the use of computers may accelerate another educational innovation, such as greater emphasis in the teaching and learning process on information handling and problem solving, and less on memorising facts. This rationale refers to the possibility that schools can be changed for the better by the introduction of new technologies. Hawkridge et al. (1990:14) refer to possible effects such as improved administrative and managerial efficiency; and more emphasis on students learning by collaborating rather than by competing. In this approach computers are seen as catalysts, enabling desired change in education to occur.

Forcier (1999:28) points out two other rationales, which have at present little support in education. Firstly, the *information technology rationale* supports the idea of stimulating a national computer industry by placing, at the government's expense, large numbers of nationally produced or assembled computers in the schools. Secondly the *cost-effectiveness rationale* argues that computers can reduce the cost of education dramatically as they will allow for a reduction in the number of educators. This rationale indeed has some validity in the domain of training in business and industry, but is not really supported in formal education because a computer, although arousing interest, cannot replace the teacher in the classroom. According to Starr (2004:1), a computer cannot transfer the smile of an educator when a learner finally grasps the concept or provide a pat on the back for a job well done. It cannot console a child who needs support or give advice with the full knowledge of individual circumstances and family situation. Starr (2004:1) also states that the role of an educator as *sage on stage* is replaced by acting as facilitator/academic coach, who engages and empowers students to play a more constructive role in their learning and accomplish their performance tasks as prescribed in the guidelines of the Outcomes-Based Education (OBE) system. This shows that the number of educators need not be reduced because a computer cannot replace an educator. A computer cannot provide a human touch (Forcier 1999:27).

In addition, Pelgrum and Plomp (1993:13) put forward an *opportunistic rationale*, consisting of the expectations that the use of computers in schools may attract more students to the school. Anderson and Collis (1996:214) point to another rationale, namely the *functionality perspective*. This perspective implies that students in schools need to learn to use computers in a way which is functional for the many different tasks they are confronted with. Such a perspective, according to them, refers to the use of the computer as a tool, for example, writing (word processing) and data handling (spreadsheet and database programs). The unique characteristics of computers, such as speed, individualization, interesting display of graphics, immediate feedback and their allowance for self-pacing on the part of the user, have been noted by Roblyer

and Edwards (2000:56). These qualities can be harnessed to make learning more interesting and ease the educator's responsibility in the classroom.

## **2.4 WORLDWIDE TRENDS IN ICT UPTAKE**

Worldwide trends in ICT will be discussed under the following headings: background, policy making and funding, teacher training in ICT integration, the role of private initiatives worldwide and successes of ICT in general and in schools in particular.

### **2.4.1 Background**

According to McFarlane (1997:20), ICT emerged as a systemic feature in the 1970s. ICT expanded throughout the 1980s to the domains of financial transactions and high technology manufacturing. In the late 1980s ICT diffused into different workplaces, and deeply penetrated homes and culture in the 1990s, with the explosive diffusion of Internet and multimedia. McFarlane (1997:28) also explains that during the 1980s, development with regard to the introduction of ICT in schools had an explosive character and many schools acquired computers. Although in some countries, such as France and United States of America, computers were used for educational purposes by 1989, in other countries they were only used for administrative purposes. ICT has diffused much faster since the 1980s and yet countries are extremely different in their degree of absorption and utilisation.

Forcier (1999:63) and Orange and Hobbs (2000:86) explain that in order to engage schools and educators with ICT integration, the availability and quality of hard- and software are seen as major prerequisites. According to Steinberg (1999:56), the place of computer education in the school curriculum has been an issue for debate in many countries irrespective of the location of computers in the school. The most common practice in the secondary school is to offer computer education instruction as a separate course. In elementary schools, computers are mostly used for drill and practice.

## **2.4.2 Policy making and funding**

The use of computers in education is beginning to have a significant impact on policy making around the world (Selwyn, 2000:94). Over the last decade a host of countries have made a considerable policy commitment to the development of educational technology infrastructure. For example in the United Kingdom, between 1998 and 2004 1.8 billion pounds will have been used on a “*National Grid for Learning*” with the special aim of raising standards (British Educational Suppliers Association, 2001:1). The Clinton administration used \$2 billion for a “*Technology Literacy Challenge*”. Germany spent DM160 million on “*Schulen ans Netz*” and Singapore used S\$2 billion for the “*Educational Master plan for ICT*” (Benting 1996:46). According to Mandla (2004:1), the Australian government announced a further \$5.3 billion in funding the Australian Computer Society for basic computer skills and ICT integration into teaching and learning. Cumming, Okamoto and Gomes (1999:435) state that in South Korea the Minister for Education took the primary role by providing funds for projects. The goals of the projects were to expand the opportunity of education to all people, to provide various learning experiences and to meet diverse learners’ needs.

According to Dawes (1999:238), in many countries, such as Japan, United States of America and Britain, the positive impact of financial support from the government has been noticeable mainly in staff development, acquisition of computers and improvement of pupils’ ICT capabilities. Despite the overall positive picture, government’s aim that ICT should become embedded in the curriculum is still only a reality in a small number of schools. Pupils’ experiences across the curriculum are sporadic and teacher-dependent and in many schools opportunities to explore the technology across all subjects is still a wish.

## **2.4.3 Teacher training in ICT integration**

Merely having computers in schools is not enough to change the quality of education. Additional efforts, such as engaging educators with ICT integration



into teaching and learning, as well as support, are needed (Ishii and Matsuda cited in Cumming et al. 1999:19). They further explain that engaging educators with ICT is essential. They emphasised that one of the key issues to be addressed is the current shortage of qualified educators in ICT. Dawes (1999:251) states that preparation of educators is perceived as the main critical success factors in deploying ICT in education. Different countries are using different strategies in training educators. For example, the Chilean government developed a strategy, which includes three phases. Firstly, *initial training* helps educators to integrate ICT into teaching and learning. The *initial training* also helps educators to create their own teaching material. The second phase is one-year of *follow-up technical assistance*, where educators are trained to oversee the proper use of ICT integration in their schools. The third phase involves *educational information technology encounters*, in which educators meet to share ideas and keep abreast of each other's achievements in ICT integration into teaching and learning.

Whilst the Chilean government developed a three phase strategy, Cumming et al (1999:420) explain that, in the United States of America, the President's Panel on Educational Technology made six recommendations, including giving special attention to professional development. This includes ongoing mentoring and consultative support, time and mobilisation to help the national schools of education so that they are capable of preparing the next generation of American teachers to make effective use of technology. Benting (1994:82) explains that in Britain, mature educator entrants bring ICT skills into the profession. However, in a survey conducted by MirandaNet (Cumming et al. 1999:429) it would seem that teachers have less than two days' ICT training in their initial training year. They are dependent on the quality of ICT training in their school. Subsequently, they rely on in-service training. According to this survey, only one percent of teachers had formal ICT qualifications. Most of these 'competent' educators were training others. Although many of the educators felt that they had benefited from the training they had received, they wanted to receive more training and also felt that they needed better resources and more technical support. Cumming et al. (1999:430) explains that, in Japan, more than 50% of educators are able to use computers for

their own work. However, only 20% of educators are able to integrate computers into teaching and learning. According to them, this is partly because teacher training has focused only on the acquisition of computer skills, but not on their use in classroom teaching. This is also evident in other countries.

Cumming et al. (1999:438) explain that the teacher training strategy in South Korea comprises two levels, that is: *advanced level* which lasts for one hundred and twenty hours and *educational software development* that lasts for sixty hours. According to Cumming et al. (2001:78), in Australia over 95 percent of teachers possess the basic range of skills required to use computers effectively for teaching and learning. Moreover, an increasing number of educators with the required skills to use computers are following an apparent age-based trend, in which younger teachers are coming into the profession with more advanced skills, while those with slightly more experience are acquiring them rapidly. Cumming et al. (1999:80) also state that in Australia many educators who are currently 20 to 30 years old have completed pre-service training in a computer-equipped university setting and in education courses that take account of ICT. The study also indicated that there is also great level of self-instruction among young teachers. From what the researcher has noted in this study, this is not yet the case in Ga-Rankuwa schools. Considerable support is needed to reach this level in our country.

#### **2.4.4 ICT: The role of private initiatives worldwide**

According to McKinsey (2004:1), new and experienced teachers need training to explore new ideas and materials, follow-up consultations, exchange ideas with other educators and observe other educators using technology. Private initiatives support and help the government in training educators in ICT. For example, *Northern Telecom* created a Teacher Training Programme to address the computer technology needs of North Carolina educators. McKinsey states that more than 40 *Nortel* volunteers spent Saturdays training educators and administrators at the company's Research Triangle Park training facilities. More than 3 800 teachers were trained at no cost to

themselves. *Hewlett-Packard*, in partnership with *Intel Foundation* and *Microsoft Corporation*, support a regional educator effort “*Applying Computers in Education*”. McKinsey (2001:1) reported that approximately 1 400 educators would be trained to integrate the use of computers within the existing curriculum in Arizona, California, New Mexico, Texas and Washington. The companies retained the Institute of Computer Technology in California to train educators simultaneously in multiple locations. Master teachers from each of the regions would serve as ongoing trainers, training educators in their area to engage with ICT at workshops.

*Apple Computer Inc.* provides a staff development program that can take beginners and upgrade their technology skills beyond basic technology integration to advanced integration (Rein, 2002:1). Rein explains that their programme encourages educators to think of the computer as a tool for teaching and learning, and to create ways to use technology to address learning objectives. She further explains that their development materials enable educators to integrate technology into classrooms, no matter which computers they use. *Telefonica* donated telephone lines and Internet connections to most primary and secondary schools in Chile. The company also provided all *Chilean* educators and learners with free e-mail accounts.

According to Mallard (2004:1), *Microsoft* and the New Zealand Education Minister recently signed a new agreement. This agreement is part of a wider government programme of bulk purchasing of software and licenses for schools, including anti-virus systems worth a total of \$27,45 million over three years. The agreement contains a number of improvements on the previous agreement negotiated with *Microsoft* in 2002. It includes software licenses now covering educators working at home. Schools will now be able to tap into a range of core *Microsoft* technology including windows operating system upgrades, *Microsoft Office 2003*, and a range of other commonly used applications.

#### **2.4.5 Successes of ICT in general and in schools in particular**

Even though much of rural South Africa remains under-developed and poverty-stricken, the uptake of ICT has been successful in many areas. A recent example of how ICT has been used successfully is the application of the Geographical Information System (GIS) in the 1999 elections in South Africa (Johnston 2001:3). GIS is a newly emerging technology, which consists of a geographical management and planning tool. It allowed the South African Independent Electoral Commission (IEC) to establish a spatial database for the entire country. According to Engelbrecht (2004:1), South Africa as a lower middle-income developing country has invested in ICT as a key enabler to become part of the global information society.

The use of ICT by the South African Revenue Services (SARS) has also improved the process of tax collection significantly. Tax legislation and related information are available to the public on the Internet, while an electronic system allows the electronic submission of payments and returns directly into SARS tax systems through third party service providers. Engelbrecht (2004:1) states that social, economic and technological changes, locally and internationally, are forcing contact universities in SA to embrace the idea of using ICT to deliver distance education or a combination of contact and distance education. The University of Pretoria, which according to Engelbrecht is the largest contact university in SA, promotes a new flexible, learning model by means of telematic education, referring to the use of various ICT media such as the Internet, interactive television, video conferencing and CD-ROMS.

Whilst the use of ICT has allowed the IEC to establish a database for the entire country and improved the process of tax collection in South Africa, it is not only this county which is now focusing on ICT in education. Countries around the world are investing large sums in ICT in schools, believing that ICT will improve the effectiveness of education by raising the quality of teaching and learning. British Education Suppliers Association (BESA) has shown that children learning a variety of subjects through the medium of ICT are more

motivated to learn. Already over 97 percent of schools in UK are connected to the Internet (BESA, 2004:1). Although overall implementation of ICT integration into teaching and learning is still in its early stages in other countries, there is evidence of its success in some countries such as New Zealand. The New Zealand Education Review Office (ERO) researched how ICT is being implemented in New Zealand and the extent to which it is integrated into the delivery of the curriculum. ERO found that schools had used ICT in delivering the essential learning areas as indicated in table 2.2.

<b>Subject</b>	<b>Percentage of ICT integration</b>
Language and Languages	91%
Mathematics	79%
Science	72%
Technology	68%
Social Science	76%
Health and Wellbeing	46%
The Arts	57%

**Table 2.1** *Level of ICT integration in the New Zealand curriculum*  
(New Zealand ERO, 2001)

According to the report, the figures should be interpreted with caution. Many schools did not have information on the use of ICT in specific curriculum areas and were unable to show evidence to support their statements about the integration of ICT into the curriculum. The New Zealand ERO (2001:1) states that the most significant feature of the findings is the relative use of ICT in different curriculum areas. The report also indicated that ICT had helped to develop the essential skills. Refer to table 2.2.

<b>Skills</b>	<b>Percentage skills developed</b>
Communication skills	77%
Numeracy skills	63%
Information skills	76%
Problem solving skills	66%
Self-management and competitive skills	66%
Social and cooperative skills	64%
Physical skills	35%
Work and study skills	63%

**Table 2.2** *Level of skills developed through ICT ( New Zealand ERO 2001)*

## **2.5 ICT UPTAKE IN SOUTH AFRICA**

The South African government has also made a commitment to engage educators with ICT integration into teaching and learning, because it needs wide access to ICT if it is to compete in a global economy (Department of Arts Culture, Science and Technology, 1997:4). The Education Department was identified by the Presidential Advisory Council as one of the departments, which needed development in ICT integration. Currently, according to the Draft White Paper on e-Education (2003:5) provinces are at different levels on the uptake of ICT integration in education. For example, the Western Cape, Gauteng and the Northern Cape have registered significant progress compared to other provinces. According to the Draft White Paper on e-Education (Department of Education 2003:5), there are still more than 19 000 schools without computers for teaching and learning, even though the number of schools with computers for teaching and learning increased from 12.3% in 1999 to 26.5% in 2002. Based on data from the Education Management Information System and information received from provinces, table 2.3 reflects the distribution of computers in schools across all provinces.

<i>Provinces</i>	<i>Schools with computers</i>	<i>Schools using computers for teaching and learning</i>
Eastern Cape	8.8%	4.5%
Free State	25.6%	12.6%
Gauteng	88.5%	45.4%
Kwa Zulu-Natal	16.6%	10.4%
Mpumalanga	22.9%	12.4%
Northern Cape	76.3%	43.3%
Limpopo	13.3%	4.9%
North West	30.5%	22.9%
Western Cape	82.4%	56.8%
<b>National</b>	<b>39.2%</b>	<b>26.5%</b>

**Table 2.3** *Distribution of computers in South African schools.*  
(Department of Education, 2003: 5)

From the evidence presented here, the engagement of educators with ICT integration into teaching and learning in SA is not as well coordinated as in other countries such as Chile, USA and France. Availability of computers in some of the provinces is still a problem. For example, the digital divide between Western Cape and Eastern Cape shows that the national government needs to intervene so that Eastern Cape and other provinces that hold middle positions in the integration of ICT in schools could be brought on par with the three other provinces (Gauteng, Western Cape and Northern Cape) with a better infrastructure. Asmal (1999:3) argues that attention must be focused on the use of technology in schools because of its impact on students' performance.

## **2.6 ENGAGEMENT OF SOUTH AFRICAN EDUCATORS WITH ICT**

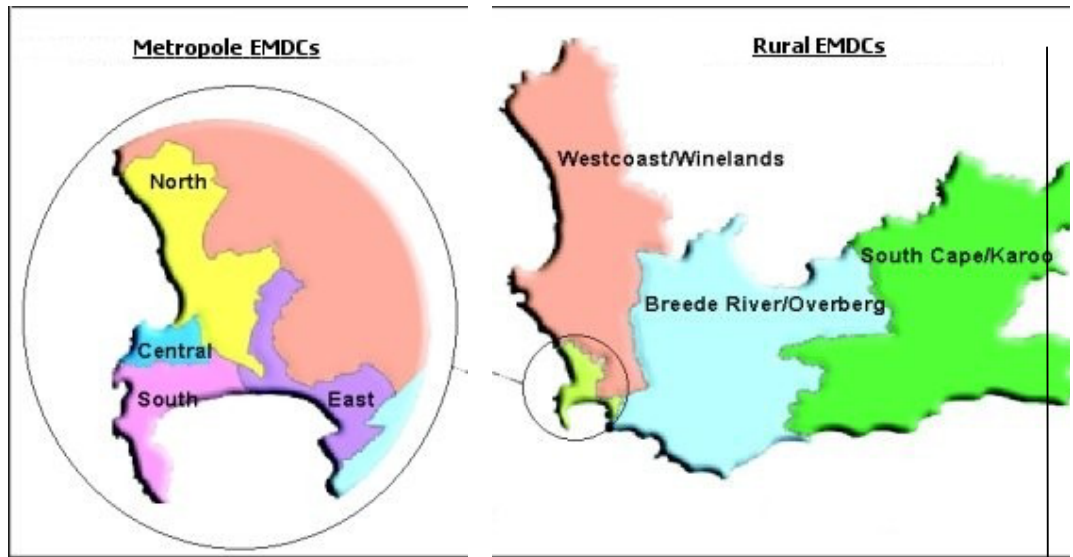
According to Johnston (2001:1), the current emphasis in South Africa is on ensuring that technology is used effectively to promote student achievement and success, as well as providing new opportunities for learners. McFarlane

(1997:42) argues that the real limitations in South African education are not in the technology itself, but in its application in practice. The bottom line is clear, technology applied well, enhances and reinvigorates education, making schools richer and more exciting interactive communities (Asmal, 1994:4). There are various ICT integration projects such as *Khanya* and *GautengOnline*, which have been initiated by the provincial governments in SA to engage educators with ICT integration into teaching and learning.

### **2.6.1 Khanya project**

The *Khanya* project is an initiative of the Western Cape Education Department, which was launched in April 2001. *Khanya* means 'light' and 'enlightenment' in Xhosa. According to Van Wyk (2003:2), schools are invited to join the project when their staff is ready to adopt these technologies and integrate them into their teaching practices. Once *Khanya* has assisted a school to obtain appropriate technology it concentrates on transforming the school into an e-institution. ICT is needed for e-institutions to connect learners to their teachers and to professional support services. This involves training of educators to help them to integrate ICT into teaching and learning. Van Wyk (2003:3) explains that educators need proficiency in selecting, modifying and designing instructional materials, and they also need to know how to plan instruction that addresses and solves complex learning problems for individual learners. It is the primary aim of *Khanya* to train educators in ICT integration into teaching and learning. The schools in the Western Cape are divided into seven regions called Educational Management Development Centers (EMDCs). *Khanya* has therefore appointed an EMDC coordinator to oversee the project implementation in each center.





**Figure 2.2** Seven educational management development centres.  
(Van Wyk, 2003:3)

### 2.6.2 GautengOnline

One of the most notable Gauteng Education Department initiatives to engage educators with ICT integration into teaching and learning is the R500 million *GautengOnline* project. Its aim is to equip each school in the province with a minimum of 25 computers by 2005. This project was launched in 2001. In 2002, various business consortia began working with *GautengOnline* to supply each of Gauteng's 2450 public schools with networked computers and access to the Internet. Burrows (2002:2) reported that the project was progressing according to plan, and was making a considerable difference to the schools where technology had already been introduced. According to Weidemann (2003:1), the project will ensure that every learner has an e-mail address by 2006. Large and small ICT companies have supported the *GautengOnline* project, which could effectively see tens of thousands of schoolchildren well-versed in ICT skills by the time they emerge into the job market.

## **2.7 PRIVATE INITIATIVES IN SOUTH AFRICAN SCHOOLS**

The lack of ICT integration skills by South African educators, has led an increasing number of private initiatives to find ways to engage educators with ICT integration. The question is: will they succeed before 2013? In the following section of this study, the researcher will discuss the following private initiatives to describe their contributions to South African schools: *Microsoft*, *Intel® Teach to the Future*, *IBM*, *SchoolNet SA*, and *FutureKids SA*.

### **2.7.1 Microsoft and other initiatives**

*Microsoft* is a staunch supporter of initiatives that engage educators with ICT (Burrows, 2002:4). Burrows explains that *Microsoft* have agreed to provide all 32 000 government schools in South Africa perpetual free access to the use of selected *Microsoft* software. Burrows further explain that five companies joined forces to equip three Rustenburg schools with technology. This venture ensured that each of the three schools received 30 computers from the *Digital Partnership*, with software donated by *Microsoft*, Furniture and networking infrastructure was provided by *Comparex Africa*, whilst *Anglo Platinum* renovated the individual computer centers with the necessary security infrastructure and *Telkom Foundation* donated R200 000 towards the upgrading of the personal computers which have been installed in the computer centres.

### **2.7.2 International Business Machines (IBM)**

*IBM* is another company that contributes to education in South Africa through technology and services focused on primary, secondary and tertiary education. Harry (quoted in Burrows 2002:2) explains that 25 high schools, located in Gauteng Province, have improved their management processes and effectiveness with computers, school administration systems software and staff training donated by *IBM*. The company has also addressed the paucity of computer equipment in disadvantaged schools through the *Wisebus* project in Atteridgeville College and Kimberley College. The

*Wisebus*, according to Harry, is a bus fitted with computers and software to teach both students and teachers computer literacy. It is said that over 600 students in Kimberley who previously had not been exposed to computers have been receiving training through the *Wisebus*. The company has also donated a computer network, consisting of 15 workstations to help support the *Tertiary Linkage Project* that enables South African technikons and universities to collaborate with U.S. colleges and universities in efforts to strengthen higher education in both countries.

*IBM South Africa* introduced the *KidSmart programme* to up to 200 pre-schools around the country to familiarize under-privileged pre-school children with technology. According to Burrows (2002:3), the programme involves installing plastic furniture and a powerful *IBM* computer pre-loaded with educational software. Burrows believes the programme is proving a success, with teachers reporting that the programme stimulates children's interest in learning, exposes them to facets of the external environment and even increases school attendance.

### **2.7.3 SchoolNet SA**

*SchoolNet South Africa* was established in November 1997 as a non-profit educational organization that creates learning communities of educators and learners who use ICT to enhance education in SA (Roos, 2004:1). In 2002, it initiated a consultation process that has seen the development of a teacher development strategy that builds virtual communities of educators in SA. The main focus of the teacher development strategy is to provide effective development opportunities for teachers who, through *SchoolNet's* project, have been exposed to computers and the Internet in the classroom for the first time (Roos, 2001:1). The company has designed, managed and implemented projects in ICT in the education sector on behalf of large international and national organizations, including the *World Bank*, *TelkomSA*, *Thintana Communications* and *Nortel Networks*.

#### **2.7.4 Futurekids SA**

*Futurekids* is an initiative which is helping to ensure that over 60 000 South Africans will be able to find employment or create their own jobs in the future (Du Preez: 2001:1). It revised its approach by taking the *Futurekids* IT system from IT education centers directly to schools in 1996. Most schools had to break with traditional and conventional practice to embrace *Futurekids* as a partner in education. According to Du Preez (2001:1), the *Futurekids* curriculum has been implemented with equal success in private and public schools, including many schools in disadvantaged areas.

The critical need for educator training has led to the introduction of professional courses for qualified school educators as well as a two-year Further Diploma in Computer Assisted Education, a joint venture with the University of Pretoria. Du Preez (2001:2) explains that with the adoption of Outcomes-Based Education in South Africa, *Futurekids* provides a strong support structure and on-going training for teachers.

#### **2.7.5 Intel® Teach to the Future**

*Intel® Teach to the Future* (the focus of this study) is a programme that is designed to engage educators with ICT integration in the classroom. It is also designed to address the challenges educators face in effectively applying computers and the Internet to enhance learning. In SA *Intel® Teach to the Future* operates in partnership with the Ministry of Education and the South African Council for Educators (SACE), with the goal of training more than 40 000 educators in three years. Candau, Doherty, Yost and Kuni (2003) explain that the programme aims to help educators use the power of computer technology to spark learner imagination, and ultimately move them toward greater learning. According to Candau et al., the goal of *Intel®* is that, at the end of the training, educators should have a unit portfolio filled with ideas and sample material. These unit portfolios should be taken to schools, and will enable educators to raise the level of excellence in their classroom, and meet learning outcomes and assessment standards of their learning areas.

Burrows (2002:5) reported that *Intel® Teach to the Future* does not only help educators to gain competence and confidence to use ICT, it also helps the communities in developing their ICT skills. *Intel®* launched an *Intel® Computer Clubhouse* in Johannesburg, to give disadvantaged children access to the best technology. According to Burrows, a computer clubhouse is more than just a safe environment for youth. It provides a supportive learning environment in which the youth builds skills and self-confidence in using professional software to create computer-based projects inspired by their own ideas. *Intel®* has partnered with two non-governmental organisations to establish three computer clubhouses in the Gauteng Province.

Youth Development Trust (YDT) hosts the computer clubhouse in Newtown, Johannesburg. This clubhouse was the first to be established in Africa in October 2002 (Burrows, 2002:5). The Southern African Association of Youth Clubs (SAAAYC) hosts one computer clubhouse in Etwatwa and another in Phefeni, Soweto. According to Botoulas (2004:1), these clubhouses are still in their infancy, but they are enjoying a great deal of success and are already starting to have significant impact on the lives of young people. An example cited by Burrows is that of a participant who was a street child who did not finish school. He became a member of the *Intel®* clubhouse in Newtown. After several months of being involved with the clubhouse, the participant became a mentor to newer members and won the Africa ICT achievers award for best creative use of ICT.

## **2.8 SUMMARY**

This chapter has outlined different government and private initiatives both worldwide and locally, which have made an impact on the engagement of educators with ICT integration into teaching and learning. It has been explained that different countries have used different strategies to train educators in ICT integration into teaching and learning. Most of these private initiatives contribute by donating computers to schools, software; teacher training and furniture. Combined efforts and other initiatives in education will

truly turn our schools into centres of excellence and answer the question posted by President Mbeki at his first Cabinet meeting: *“Is our education system on the road to the 21<sup>st</sup> century?”* (Department of Education & Department of communication, 2001:18). In the next chapter the researcher will discuss the research methods used to explore the influence of private initiatives on the engagement of educators with ICT integration.



## CHAPTER 3

# RESEARCH DESIGN, RESEARCH METHODOLOGY AND DATA COLLECTION TECHNIQUES

### 3.1 INTRODUCTION

In order to answer the research question, a suitable research design has to be selected. The purpose of this chapter is to describe the research design of the study. In this chapter the research design, research methods, participants, data collection techniques and data analysis methods are discussed.

### 3.2 RESEARCH DESIGN

According to Lancy (1997:65), there are two main designs that are widely discussed in the literature, namely qualitative and quantitative. Henning et al. (2004:3) explain that the distinction between the quantitative and qualitative designs lies in the quest for understanding and for in-depth inquiry. The quantitative method in general is supported by the positivist paradigm, which leads us to regard the world in terms of observable, measurable facts. In contrast, qualitative methods are generally supported by the interpretivist design, which portrays a world in which reality is socially constructed, complex and ever changing.

A qualitative research design was used in this study. This method usually takes place in natural situations, which exhibit control, behaviors and settings (Lancy, 1997:67). Qualitative research typically entails analysis of relatively few subjects for which a rich set of data is collected and organised. It also emphasises understanding verbal narratives (Creswell, 1998:3). In this inquiry the researcher talked and listened to educators who attended the *Intel® Teach to the Future* training programme in order to gather data.

Since qualitative researchers deal with multiple, socially constructed realities that are complex, they regard their research task as coming to understand and interpret how the various participants in a social setting construct the world around them. To make their interpretations, the researchers must gain access to the multiple perspectives of the participants. Clesne and Peshkin (1998:22) explain that because the researchers focus on in-depth interaction with relevant people in one or several sites, the researcher becomes the main research instrument as he or she observes, asks questions and interacts with research participants.

The characteristics of qualitative research outlined by Bogdan and Biklen (1996:23) are as follows:

- Qualitative research demands that the world be approached with the assumption that nothing is trivial, that everything has the potential of being a clue that might unlock a more comprehensive understanding of what is being studied.
- Qualitative researchers are concerned with process rather than simply with outcomes and products.
- Qualitative research is descriptive.

In addition, Merriam (1998:8) states other characteristics of qualitative research as follows:

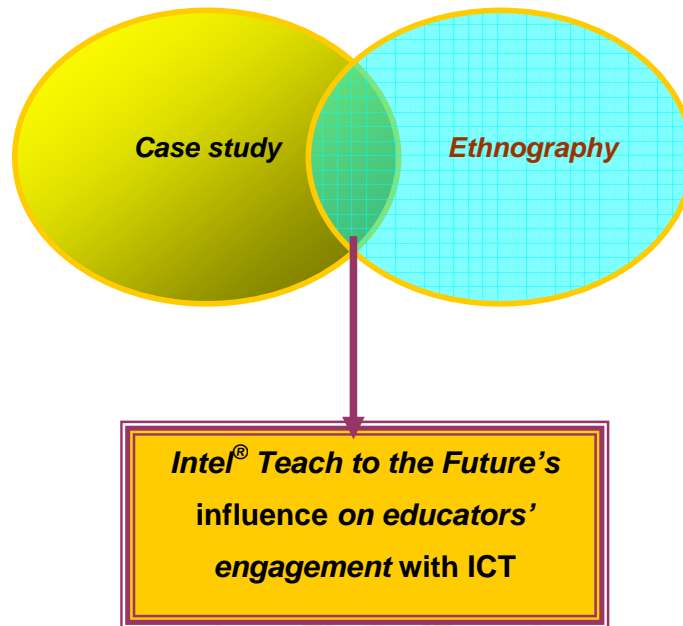
- Qualitative research can reveal how all the parts work together to form a whole.
- It assumes that reality is holistic, multidimensional and ever changing.

### **3.3 RESEARCH METHODOLOGY**

According to Bryman & Burgess (1999:175) the research method serves to “plan, structure and execute findings”. The research method of this study is a



hybrid of a descriptive, interpretive case study and ethnography, utilising qualitative methods (see figure 3.1).



**Figure 3.1** *The research methods used in this inquiry*

### 3.3.1 Case study as used in this inquiry

There are various definitions for a case study. Merriam (1998:27) and Creswell (1994:12) describe a case study as a method in which the researcher explores one setting, or single subject, single depository of documents, or one particular event, and collects detailed information by using a variety of collection techniques during a sustained period. Lancy (1997:140) described a case study as “the method of choice for studying interventions or innovations”. The case study is also defined as a way of organising social data and looking at the object to be studied as a whole. Henning et al. (2004:41) state that a case study design is employed to gain an in-depth understanding of the situation and meaning for those involved. In this inquiry the researcher gained an in-depth understanding of the influence of *Intel® Teach to the Future* in the integration of ICT into teaching and learning, focusing on a selected group of educators from three Ga-Rankuwa secondary

schools. Stake (as cited in Henning et al., 2004:32) indicates that the main assumption in a case study is that a phenomenon is investigated as a bounded system. The bounded system in this case study was a group of selected Ga-Rankuwa secondary schools educators in a training center. The description of 'how' training takes place, 'where', 'when' and 'why' was noted and formed an important part of the study.

### **3.3.2 Ethnography**

Whilst a case study is characterised by the focus on a phenomenon that has identifiable boundaries, ethnographies are not characterised by their boundaries alone, but try to capture the way of life within a group. Capturing a way of life according to Henning et al. (2004:42) involves getting to know the people and their practices as these occur as everyday actions. Creswell (1994:163) explains that the intent of ethnography is to obtain a holistic picture of the subject of study with emphasis on portraying the everyday experiences of individuals by observing and interviewing them. In this inquiry getting to know the engagement of educators with ICT would entail more than just interviewing them. The researcher had to join them for a period of time as a stranger who seemed to be participating marginally in the activities but who remained an outsider and observed their engagement in action. The researcher used any methods that yielded information of the engagement of educators with ICT. This includes observation, focus group interviews and document analysis.

### **3.4 PARTICIPANTS IN THE STUDY**

The selection of participants was not a simple task because it involved complex negotiations with a number of role players. The target group consisted of 24 educators who attended the *Intel® Teach to the Future* training programme at the Hebron training college, in Ga-Rankuwa.

### **3.5 DATA COLLECTION TECHNIQUES**

Interpretivist researchers acknowledge the fact that observation cannot ensure valid and reliable results, hence they encourage varieties of data and different sources in order to strive for validity. Qualitative researchers depend on a variety of methods for gathering data. Clesne and Peshkin (1998:24) state that the use of multiple-data collection methods contributes to the trustworthiness of the data. They further explain that this practice may also involve the incorporation of multiple investigators in order to increase confidence in research findings. In this study the researcher was the only investigator. In order to understand a phenomenon in this inquiry data was collected at different places: at the ICT training center and at three different selected Ga-Rankuwa secondary schools. Various data collection techniques such as observations, focus group Interviews and document analysis were employed. According to Henning et al. (2004:6), the three data collection techniques mentioned above, are the main categories of data collection techniques in qualitative research.

#### **3.5.1 Observation**

According to Henning et al. (2004:82), observation may mean participating in the actions of the people in the research setting and getting to know their “ways of doing” very well. Participatory observation was employed in this study. The researcher had to join the educators at the training center for a period of time as a trainee in ICT. According to Clesne and Peshkin (1998:39) participatory observation provides the opportunity for acquiring the status of “trusted person”.

According to Henning et al. (2004:83), the researcher could not simply enter a group and hope to see what he/she wanted to observe through the eyes of the members. The researcher had to participate in the everyday activities of the group in order to come to some interpretive understanding of the meaning of activities and social repertoires in context. The researcher observed everything that was happening at the training center and made notes,

concentrating on the research problem. She studied the setting and described it in words. The researcher was the main instrument who selected the data source and the focus of observation continuously. She was always actively and consciously involved, not only gathering data and making decisions about what to observe, but also in managing the process. She observed, took notes and decided when to participate and when just to observe.

### **3.5.2 Interviews**

According to Mostert (2000:45), an interview is a social encounter. The interviewer should establish a good rapport with the interviewee and assure the respondent confidentiality. Interviews provide opportunities of interchange between two people, resulting in more in-depth and clarified information. The researcher had a chance to explain any misinterpretation or ambiguous items to the interviewees. Through elaboration by interviewees, more valuable information was obtained.

The researcher conducted a single focus group interview. According to Lancy (1993:85), focus groups are special types of groups in terms of purpose, size, composition and procedures. They are used to a particular kind of information that would be difficult, if not impossible to obtain using other methodologies. Lancy (1993:86), explains that focus groups provide information about perceptions, feelings and attitudes and thus expose human tendencies. The interview was audio recorded and the recordings later transcribed.

#### **3.5.2.1 *Advantages and disadvantages of focus groups***

The advantages and disadvantages of focus groups according to Lancy (1993:87) are summarised in table 3.1.

Advantages	Disadvantages
1. It is a socially oriented research procedure that places people in natural, real-life situations.	1. The researcher has less control of a group interview when compared to an individual interview.
2. The format allows the moderator to probe, which can lead to exploration of unanticipated issues.	2. Participants may influence each other and the interviewer must keep the discussion focused.
3. Focus group results have high face validity and are relatively low in cost.	3. Data may be more difficult to analyse as group interaction provides a social environment, and comments should be interpreted within that context.
4. Focus groups provide speedy results.	4. It can be difficult to assemble a group.

**Table 3.1** Advantages and disadvantages of focus groups (Lancy, 1993:87)

### 3.5.3 Document analysis

According to Henning et al. (2004:99), documents and other artifacts are a valuable source of information and if they are available they should be used. All the documents which relate to the research question, such as participants' portfolios were of value to the researcher in this inquiry. Documents created by educators during the *Intel*<sup>®</sup> ICT integration training were collected and analysed. The researcher looked at the similarities and differences between documents created by educators with varying levels of competence with computers. After comparing these artifacts created by educators, the

researcher was able to provide more evidence of the engaged educators with computers.

### 3.6 DATA COLLECTION STRATEGIES

Table 3.2 indicates which technique was used to collect data according to the various research sub-questions.

Sub-questions	Data collection techniques		
	<i>Interview</i>	<i>Observation</i>	<i>Documents Analysis</i>
1. How do educators engage with computers during a training programme organised by a private initiative?	X	X	X
2. What artifacts were produced by educators during the training programme?			X
3. Does the private initiative influence the educators' ability to function effectively in modern society?	X	X	X

**Table 3.2** *Data collection strategies*

Table 3.2 is also used to emphasise the validity of the findings. For example, sub-question 1 was answered by all three data collection techniques. During the interview educators mentioned that they have been trained to create

multimedia presentations, learners' publications and websites. The researcher was also present to observe when educators created multimedia presentations. The documents produced by educators also supported what the interview and observations revealed.

### **3.7 DATA ANALYSIS**

Data analysis is the process of systematically arranging data collected (Bogdan and Biklen, 1996:73). According to De Lisle (2000:44), analysis involves working with data, organising it, breaking it into manageable units, discovering what is important and what is to be learnt and deciding how the report will be written. Kelle (1999:3) explains that qualitative data analysis is the process employed to 'reduce' data from intensive interviews or holistic observations in such a way that it becomes distilled to its essentials, rather than simply being diminished in volume.

Data analysis started at Hebron College while the research was being conducted. The researcher carried out the observation as a participant. Being a participant observer, the researcher completed some of the activities given to educators who attended the *Intel*<sup>®</sup> ICT integration training and also observed how educators were engaging with computers. She thus recorded data in such a way that she would be able to use these data when she became the author of the research text. As Henning et al. (2004:85) predicted the researcher also found the participation extremely valuable. The researcher did not simply see educators in action but she became part of the action for four weeks. Towards the end of the fourth week, 10 educators were then invited to take part in a focus group interview.

During the interview the researcher aimed at finding what participants thought and felt about the *Intel*<sup>®</sup> *Teach to the Future* training programme. The interview was audio taped and transcribed and written in qualitative text. The process of coding was the preliminary step for the actual data analysis. Lofland and Lofland (1995:186) defined the coding of data as the process of categorizing and sorting data. Henning et al. (2004:131) state that open

coding refers to naming and categorising phenomena through close examination of the data. Tesch (1990:89) explains that qualitative coding means creating categories from interpretation of the data. Rather than relying on preconceived categories and standardised procedures, qualitative coding has a distinctive structure. In this inquiry Henning et al.'s approach to open coding was applied. The researcher made sense of the data in order to construct meaningful patterns of facts by looking for structures in the data. This was achieved by breaking data down into codes and comparing the different text passages in order to find commonalities or differences between them. The ensuing codes were categorised. Each category was named inductively, using data as a guide in deciding what a category should be called.

### 3.8 TRUSTWORTHINESS

According to Miller (1999:52), validity and reliability are measures to ensure trustworthiness. They are used to establish the truth-value of the research that is critical to the accurate representation of subjective human experience.

Validity refers to whether one has in fact investigated what one wished to investigate. Subjectivity can be considered a thread to valid inferences in qualitative research. Bryman & Burgess (1999:178) argues *“especially in theoretical research this problem emerges as a problem of objectivity”*. In this regard Bogdan and Biklen (1996:46) note, *“the worth of a study is the degree to which it generates theory, description or understanding”*. Thus a good qualitative researcher does not pass judgment, but attempts to add to knowledge. Validity deals with the question of how research findings match reality, yet according to the philosophy underlying qualitative research, reality is relative to the meaning that people construct within social contexts. Merriam (1998:104) provides the following strategies to enhance validity in qualitative research:

- *Long-term observations*: the researcher observed participants for four weeks at the training center.



- *Participatory or collaborative modes of research:* as a participatory observer the researcher completed some of the activities along with the participants during the training programme
- *Using multiple sources of data or methods to confirm emerging findings:* the researcher employed three data collection technique to enhance the validity of the findings of this study.

### **3.9 SUMMARY**

This chapter focused on the selection of a research design. A qualitative research approach was selected because of the need for descriptive information on the influence of *Intel® Teach to the Future* on the engagement of educators with computers during the uptake of ICT. Three data collection techniques employed were explained. The researcher also explained data analysis procedures. The next chapter will review the findings of the study.



## CHAPTER 4

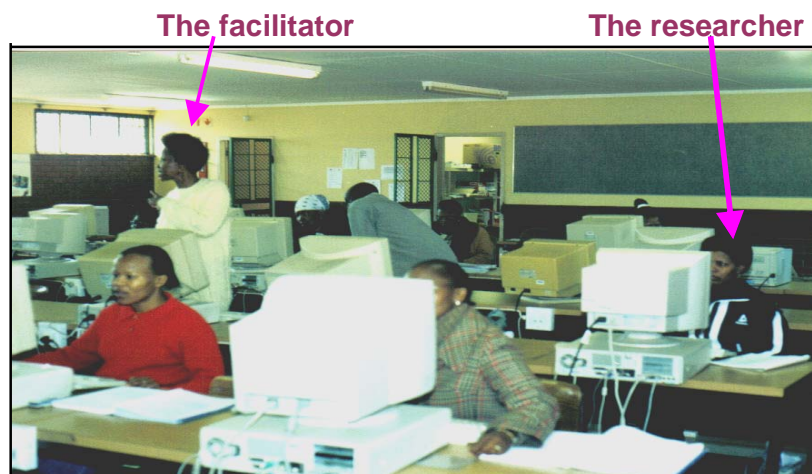
# ANALYSIS OF PARTICIPANTS AND RESEARCH FINDINGS

### 4.1 INTRODUCTION

The purpose of this study is to investigate the influence of private initiatives on the engagement of educators with computers during the uptake of ICT. *Intel® Teach to the Future* was selected as a private initiative, which is currently training educators on ICT integration. A number of data collection techniques such as observations, focus group interviews and document analysis were used in the inquiry. The results of the analysis of data gathered using these methods are discussed in this chapter.

### 4.2. ANALYSIS OF PARTICIPANTS

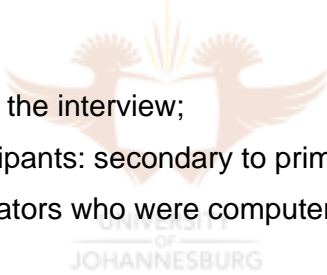
The target group consisted of 24 educators who attended the *Intel® Teach to the Future* training programme at Hebron Training College during May 2004. Figure 4.1 shows some of the educators who attended the training.



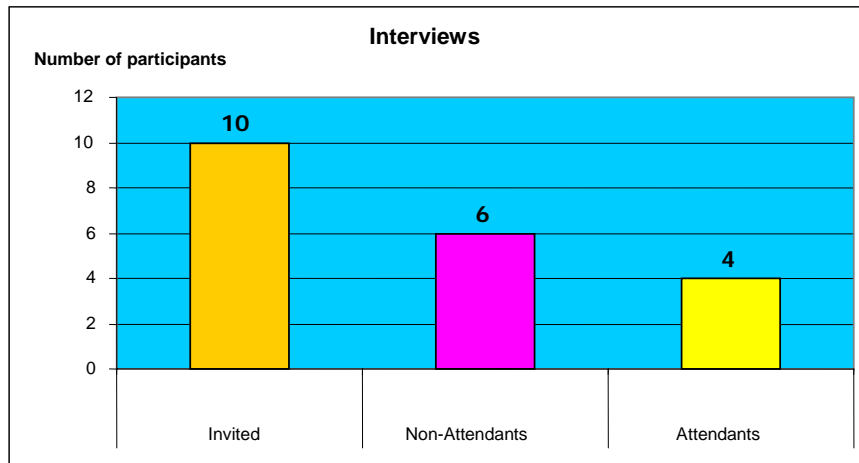
**Figure 4.1** *Some of the educators who attended the training*

Figure 4.1 also serves as evidence that the researcher was a participant observer at the training center (The researcher is seated at the extreme right). It also shows collaboration. Some educators were busy helping others whilst the facilitator continued with other programmes.

The sample of 24 educators was very small, therefore restricting generalisations that could be made by the interpretation of the findings in similar contexts. It should be noted that when analysing the target group, the number within the brackets denotes the sample size. For example 29% (7) refers to a percentage of 29 and a number of 7 educators respectively. The researcher decided to draw graphs to emphasise the analysis of the target group. All target group analysis will be emphasised by graphs. Figures 4.2, 4.3 and 4.4 show graphic representations of some of characteristics of the target group, namely:

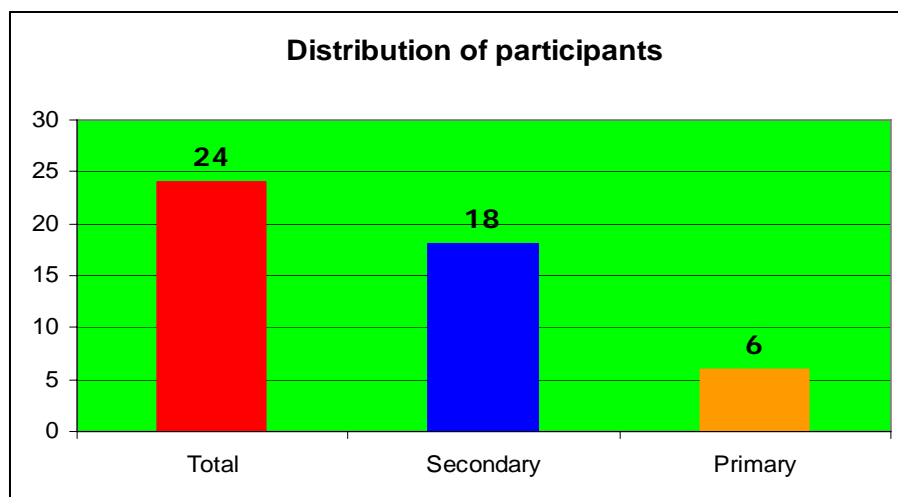
- 
- those who attended the interview;
  - distribution of participants: secondary to primary educators;
  - the number of educators who were computer literate.

All 24 educators were invited to the interview, but only 42% (10) accepted the invitation. Of the ten educators who accepted the invitation, only 40% (4) attended the interview as illustrated in figure 4.2. During a personal conversation with one of educators who did not attend the interview, he said that it was clearly stated in the invitation letter that one could withdraw at any time. So he decided not to come because he felt that he was not ready for the interview.



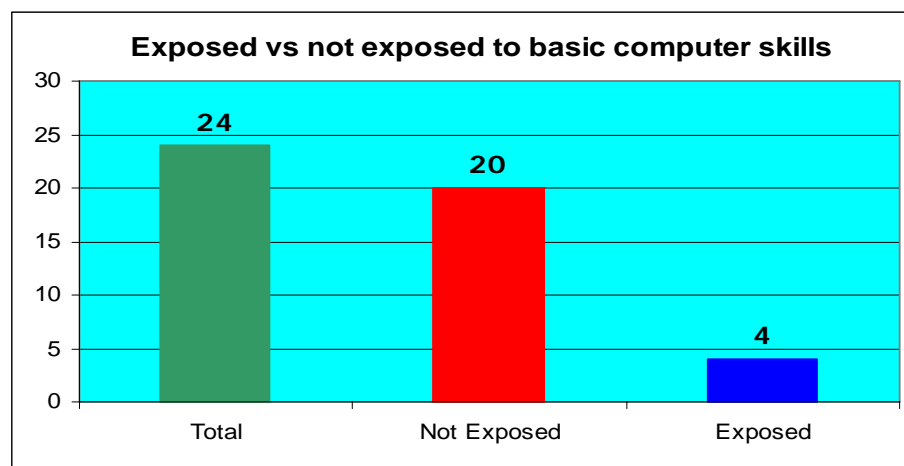
**Figure 4.2** Attendance figures for interview

During personal conversation with the facilitator it was determined that circulars were issued to all schools in the district, to invite interested educators to the *Intel*<sup>®</sup> training programme. Even though one of the educators recommended during the interview that the *Intel*<sup>®</sup> training programme should be used from pre-primary to tertiary level from the information given, it is evident that most of the educators who were interested in this programme were from secondary schools. 75% (18) of the target group were secondary educators, and 25% (6) were primary educators. Figure 4.3 illustrates the distribution of primary educators to secondary educators.



**Figure 4.3** Distribution of the participants: secondary to primary educators

It is also important to note that 83% (20) of the target group had not previously been exposed to any computer training. During personal conversation, the facilitator pointed out that educators who attend the *Intel*<sup>®</sup> programme were supposed to be computer literate. The researcher would like to highlight this and also mention that a special arrangement was made to accommodate any interested educator to the programme because it seems as if most of the educators who were computer literate were not interested in the programme, Consequently, the facilitator had to accept even those who did not have basic computer skills as illustrated in Figure 4.4.



**Figure 4.4** Basic computer skills exposure

Of the four educators who were computer literate, 75% (3) had computers at home, and were able to complete their activities at home.

### 4.3 RESEARCH FINDINGS

The *Intel*<sup>®</sup> *Teach to the Future* training programme undertaken by participants at Hebron College was conducted to help educators to “*expand the boundaries of their creativity and that of their learners beyond the walls of the classroom*”. (Candau, Doherty, Yost & Kuni, 2003:1.2). The programme lasted for four weeks from 14:00 to 16:00 (2 hours) every day. The programme incorporated web page design, educators’ projects and the use of Internet. Educators completed *unit portfolios* as suggested by *Intel*<sup>®</sup> based upon

materials they were teaching at their respective schools. According to Candau et al. (2003:3.2) all *unit portfolio* components should be saved in a portfolio folder that educators should take back to their schools and use for teaching. The data that was used in this study was collected from observation, a focus group interview and document analysis. The data was transcribed and analysed by qualitative methods and techniques that are described in chapter three. The analysed data yielded and identified five categories namely:

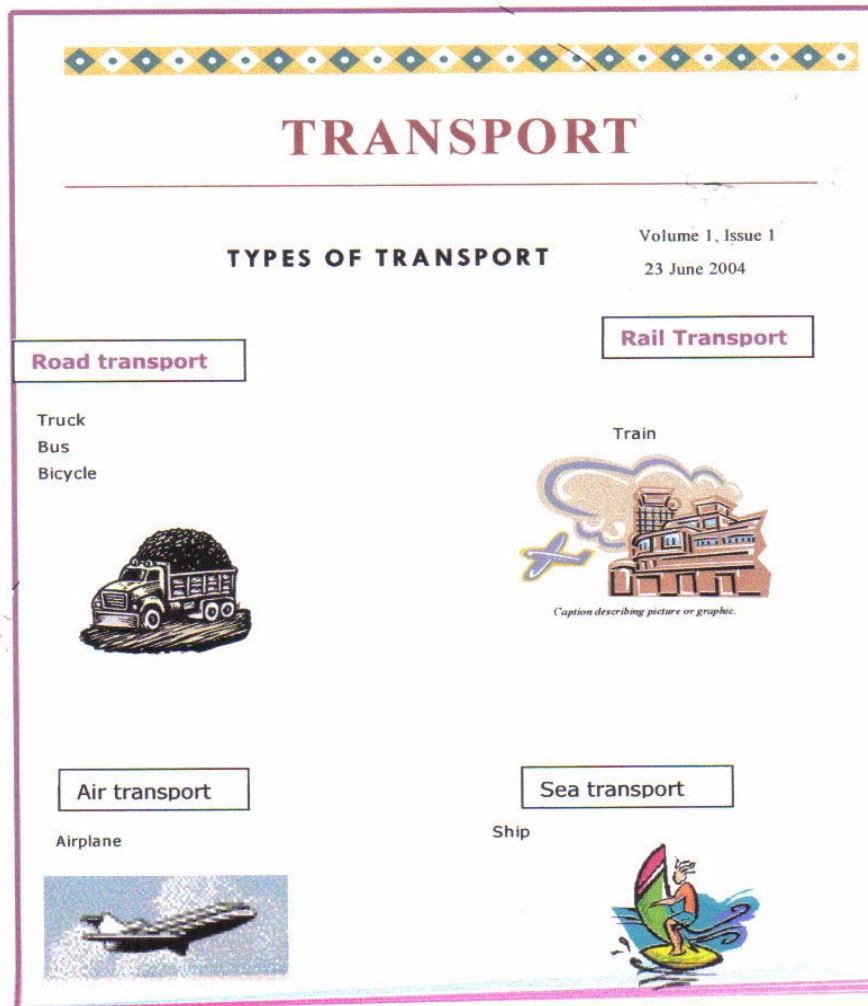
- the influence of basic skills on the engagement of educators with computers;
- the influence of the course material on the engagement of educators with computers;
- the influence of physical resources on the engagement of educators with computers;
- the influence of motivation on the engagement of educators with computers;
- the influence of implementing what is learnt on the engagement of educators with computers.

#### **4.3.1 The influence of basic skills on the engagement of educators with computers**

During a personal conversation with the facilitator, she pointed out that educators who attend the *Intel*<sup>®</sup> programme were supposed to have basic computer skills, but 83% of the participants had not previously been exposed to any computer training. During the observation, the researcher noticed that educators who did not have basic computer skills used the *Microsoft Word* template from the CD supplied by *Intel*<sup>®</sup> to develop a *unit plan* because it was difficult for them at the initial stage of their training to create unit plans without templates. Candau et al. (2003:1.10) explain that the unit plan can be used in different ways. For example, it could be used for detailed planning of each individual lesson or it could be used to plan a series of lessons on a learning programme. It could also be used to integrate a learning area with other

learning areas. Educators were advised by the facilitator to use it in the manner that would suit their situation. Therefore, educators developed unit plans based on the learning areas they were teaching and topics of their choice. It was also noticed that much time was spent assisting those educators on how to move a cursor, how to click on a mouse, how to save and how to copy and paste, rather than assisting them on how to integrate ICT into their learning areas. Those who had basic computer skills were not happy about this arrangement because one of them stated in an interview that the educators who were not computer illiterate slowed them down. He added that, **“We could have learnt more if most of our time was not used for basic computer skills training”**. On the other hand one educator who had basic skills indicated during the interview that he had learnt more about software packages as well as about his learning areas because of the extra time he had to experiment with all of the software: **“I have learnt how to use Microsoft Word, Microsoft Publisher, Microsoft Encarta and other software packages”**. This indicates an advanced level of engagement with computers that was not evident in those participants with limited basic skills.

By using *Microsoft Publisher*, educators developed important cognitive skills, and they were given an opportunity to be creative especially as most of them came to the training without basic computer operating skills. Educators were requested to pretend to be learners and create a newsletter using *Microsoft Publisher*. Each educator created a newsletter, which suited a grade he/she was teaching. Websites based on what they were teaching at their respective schools were also created using *Microsoft Publisher*. Figures 4.5 and 4.6 illustrate newsletters, scanned from educators' portfolios.



**Figure 4.5** Document created by an educator without basic computer skills

There was a huge difference between documents created by educators who had basic skills and those who did not have basic skills at the beginning of the course. The skills displayed in figure 4.5 and figure 4.6 serve as evidence that the level of basic skills influenced the quality of work created by educators during the *Intel*<sup>®</sup> training programme. Figure 4.5 was created by an educator who did not have any basic computer skills when registering for the *Intel*<sup>®</sup> training programme, whereas the educator who created figure 4.6, had basic computer skills.


Carey and Dick (1996:28) state that an attractive appearance is easier to achieve than good instruction. Many documents that were created by educators at the training were visually attractive but not good on content and



design, for example, figure 4.5. Even though the researcher regards what has been displayed as a lack of skills on behalf of the designer (educator), it can still be seen as an achievement for the educator taking into consideration that he had no basic computer skills at the beginning of the training. For example, he tried to format the document but there is a lot of wasted space which could have been used for explanation or definition of terms that appear in the document. Headings are also poorly aligned. According to Alessi and Trollip (2001:63), the relationship of text and graphic information is important. When a combination of text and graphics appears on a display, it is useful to enclose the text in a box or emphasise the text with an arrow. In figure 4.5 there is inconsistency in emphasising the text.

A document created by the educator with basic computer skills can be found on the next page.





# TRANSPORT

**MERAFENG PRIMARY**

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## Prons and cons of transport

**A. INTRODUCTION**


1. Learners to understand that transport have changed over time, dangers, advantages and disadvantages.
2. The educator will explain to learners that transport is moving people, animals or property from one place to the other.
3. Mention different means of transport.
4. Learners will too give the means of transport they know.
5. This is to give learners an idea on how to go about in their research.
- 6.

**B. RESOURCES.**

1. Learners are advised to interview their parents, to visit transport museum and to visit internet.
2. Learners are divided into groups of five.
3. Each group choose a leader and a scribe.
4. Each group is given questions to research example
5. How did societies transport goods in the eighteen century.
6. Learners will complete survey sheet .

**C. PROJECT DEADLINES**

1. Learners are given three days to report



back to their respective groups so that they can draw comprehensive reports.

**Inside this issue:**

Introduction	<b>A</b>
Resources	<b>B</b>
Project deadlines	<b>C</b>
Assessment	<b>D</b>
Interesting facts	<b>E</b>

## D. ASSESSMENT

**Group 1**  
Activity

Survey sheet : Special transport needs of disabled people.

1. Is your local bus sta-

tion accessible to people in wheelchairs?

2. Plan a road by drawing a map of the location of the road.

**Group 2 :**  
Write a letter about your

concerns about the transport needs of disabled people to the local municipality.

**Group3**  
Described how technology changed transport.

**E. INTERESTING FACTS**

**1903:the Wright brothers were the first people to fly.**

**Trans- Alaska pipeline carry petroleum from the Arctic Ocean to the Gulf of Alaska.**

**Plus minus 25 555km of railway track is used in South Africa.**

**Figure 4.6** Document created by the educator with basic computer skills

Figure 4.6 on the other hand shows a different level of ability that can possibly be ascribed to the level of skills the participant already had when starting with the programme. Alles and Trollip (2001:61) state that spacing between lines affects text readability. Consistent use of spaces to indicate a new sentence or paragraphs has been used in figure 4.6 and this makes the text readable and attractive. This is something that is lacking in the work of participants with limited basic skills. In this view of text formatting the educator pointed out her concern about educators who had limited basic skills: ***"I think in future all those educators who will be attending this programme must have basic***

**computer skills so that they only have the problem of integrating the content with technology and not how to use the computer".** A table has been used to call attention to the heading and sub-headings are underlined and emphasised in bold. Pedagogy has been taken into consideration by the educator. Figure 4.6 is a well-formatted and informative newsletter. It has an index, an introduction which states the objectives of the lesson, instructions (what is expected from a learner including the deadline for submissions) and assessment. The educator also summarised interesting facts for the learners. Colour combination makes the newsletter readable and attractive.

Figure 4.6 is an example of how *Intel*<sup>®</sup> influenced the engagement of educators who already had a certain level of basic computer skills. As Carey and Dick (1996:30) explain, no other single cosmetic feature can undermine the credibility of a lesson as quickly as spelling or grammatical mistakes. Figure 4.6 is free from spelling and grammatical mistakes, which implies that the educator concerned used standard text-editing procedures to eliminate errors. Once basic skills were mastered, participants were able to use the *spell-check* to identify spelling and grammatical mistakes and to make text attractive and readable.



#### **4.3.2 The influence of course material on the engagement of educators with computers**

At the training center the researcher observed that every educator received a manual and a CD from the facilitator. Each manual had 10 modules. The facilitators started with module 1 where educators were taught how to create a portfolio folder. After creating portfolio folders for every activity given, for example, creating learner multimedia presentations, educators had to view a variety of examples from the programme CD-ROM. Participants discussed those examples with other educators who were teaching the same learning area.

After viewing the examples participants planned the content based on a topic of their own choice, and created a multimedia presentation that served as a

learner sample in their portfolios. They used *Microsoft Word* to create *unit plans, assessment tools* and *worksheets*. Four software packages were used at Hebron College training centre viz: *Microsoft Word, Microsoft PowerPoint, Microsoft Publisher* and *Microsoft Encarta*. Other software packages such as *Microsoft Excel, Microsoft FrontPage* and *Microsoft Internet Explorer* could not be included in the training because of time constraints and lack of facilities. The course material influenced the engagement of educators with computers in the sense that all *portfolio* components were to be saved in a portfolio folder that educators could take back to their schools and use for teaching. The CD and the manual were also given to educators as a reference to be used at their respective schools.

#### **4.3.3 The influence of physical resources on the engagement of educators with computers**

The researcher noticed during observation at the center as well as at schools that engagement was influenced by different resources such as: software used at the center, Internet access and the availability of computers and electricity. Lack of resources such as the Internet influenced the engagement of educators negatively. Locating Internet resources for *unit portfolios* was a problem experienced by educators during training. Educators could not use the search engines because the centre had not begun subscribing to a service provider and as a result they did not use the Internet. The only place where educators could access the information was from *Microsoft Encarta Encyclopedia 2002*. One educator mentioned during the interview that *Intel®* is a very good programme which provides alternatives. ***“Even if there is no Internet, it gives learners an opportunity to be able to search for information through Microsoft Encarta”***. During personal conversation with the facilitator, she said the College was considering connecting to the Internet, and all educators who had already been trained would be invited to complete module 2, which is about Internet resources. On the other hand having an Internet connection in a school influences the engagement of educators with the computer. For example, the Management and Economic Science educator mentioned in an interview, ***“In most cases our textbooks do not***

***have the latest information about the new developments in transport and other economic matters. I normally search information in the Internet when I prepare a lesson so that I could impart that information to my learners”.***

Apart from software and Internet resources, the effectiveness of the training was influenced by computers and basic infrastructure resources such as electricity. During the interview, one educator mentioned that they did not implement the programme at their school because of the condition of their computers. ***“Computers are not always in good condition. They are broken time and again. We decided as the staff not to implement what we have learnt until management decides to have interest in maintaining those computers”.*** Another educator mentioned that at their school they did not implement the programme because of the lack of electricity. ***“In most cases there is no electricity at our school and in that case it is difficult to implement what we have learnt at Intel®”.***

#### **4.3.4 The influence of motivation on the engagement of educators with computers**

Engagement of educators with computers was influenced to some extent by extrinsic motivation from principals and colleagues. During the interview some educators indicated that they lacked support from their principals. ***“I do not know why I am attending this training because my principal denies me access to the computers. There are only three people allowed to use computers at our school and they refused to attend the training”.***

Some educators arrived late almost every day at the training. They indicated that they came late to the training because their principals held them up just when they were about to attend the training and they were de-motivated. The researcher noticed that these educators were not happy about being late. The researcher could notice from facial expressions that they were concerned about late coming. During personal conversation, one of them said, ***“I wish that this training course could be conducted during the holidays when I***

***am free from schoolwork. It seems as if I am not interested in the course when I always come late”.***

It was also noticed during the observations that some of the educators did not attend training regularly. Their reasons varied. One lady teacher explained that she did not attend regularly due to meetings scheduled at their school. Another one said, ***“My principal would not allow me to leave the school’s programmes that were already in place to attend the Intel® programme. I am really not motivated anymore because I am far behind other trainees”.***

Whilst some educators were concerned about lack of punctuality and their inability to cope with the training because of the workload, the researcher noticed that some educators were not ready to change. It appeared as if they were forced by their principals to attend the training. However, those who were willing to change were keen to learn more. They worked together in small groups, drew on each other’s strengths and assisted each other in completing the activities. This method encouraged supportive relationships and good communication skills among participants. They were motivated to pursue their goal through collaborative efforts.

During the interview, one motivated educator said, ***“I went through training and also went through the manual at my own pace and discovered new information every day which helped me to gain confidence in teaching with computers”.*** The researcher noticed that motivated educators had a positive attitude towards the Intel® training programme. During the observation at the center, the researcher noticed that educators were patient with one another, helping each other while the facilitator was busy helping others. During a personal conversation with them, they reported that they enjoyed working on the programme and helping one another. The researcher realised that educators were motivated and excited about the programme. They found the visual displays interesting, while the graphics helped them to visualise concepts that were difficult to explain in ordinary lessons. Most of them were so impressed that they even indicated that they were strongly motivated to

acquire personal computers for home use. In spite of all difficulties that educators went through during training, such as lack of basic computer skills, they were still motivated at the end of the training and acknowledged *Intel*<sup>®</sup> as a programme which could be used in all schools. One of the educators mentioned during the interview that if learners experience technology at an early stage, they would be able to use it at home, at school and also at their workplaces. Another educator said, ***“If I was the minister of education I would encourage all schools to use this programme, from pre-primary to tertiary level”***.

#### **4.3.5 The influence of implementing what was learnt at the training on the engagement of educators with computers**

The researcher noted the engagement of educators with computers when these educators transferred what they had learnt from the training to their learners. During the interview one educator said, ***“I’ve learnt so many things from Intel<sup>®</sup> programme which I am using to empower my learners to prepare for Science projects”***. Another educator explained during the interview that he requested learners to search for information about heart and kidney diseases from the Internet. He said, ***“Learners could easily search for information because I have imparted the technique of searching which I have learnt from Intel<sup>®</sup> to them”***. The researcher visited three schools in order to observe the implementation of what was learnt at the *Intel*<sup>®</sup> training center. For the purpose of this study, the three schools will be labelled School A, B, and C. The researcher observed that schools A and B were not actually integrating ICT into their learning areas, they were teaching computer literacy. The reason given by school A was that they had already contracted a certain company to teach computer literacy in their school, and they could not terminate the contract. They would have to wait for the contract to expire and then start with the implementation of the *Intel*<sup>®</sup> programme.

School C was the only school, which was implementing the *Intel*<sup>®</sup> programme. Although 12 educators in school C had attended the *Intel*<sup>®</sup> training programme, only three science educators were implementing what

they had learnt. Even though educators indicated that this programme had helped them to attend to learners individually, during the period of observation it was noticed that because of the lack of computers learners had to work in groups. During the classroom observation, an educator placed his grade 12 learners in small groups and asked them to work in groups. He often interrupted the class to make a point or pose a question so as to be sure that learners understood what was required of them. On the other hand a range of technical difficulties were encountered that affected the successful implementation of computers in the teaching and learning process. One educator commended during the interview, ***“I am not implementing the programme because we have 30 computers at our school which are not always in good order and needed to be serviced”***.

In another incident, the science educator worked hard to answer demanding questions from learners. However in some cases he was unable to address all enquiries at the same time. Therefore, the learners could not continue with the work. The more resourceful learners consulted peers at such times and were able to continue. The educator was very excited about the lesson, especially when he realised that learners were able to help one another to continue with the work. Implementing what was learnt at the training helped him in facilitating the lesson and this gave the educator the confidence to engage with the computer. Fortunately the researcher was an educator at school C and she observed that implementing what was learnt influenced the engagement of that particular educator with computers and improved his teaching method. The researcher also observed that the implementation of the *Intel*<sup>®</sup> programme promoted professional collaboration among educators at school C. This was evident when one educator at school C instructed the other educators how to use computers in their learning areas.

#### **4.4 SUMMARY**

According to Candau et al. (2004:1), the *Intel*<sup>®</sup> programme was created in response to the request of educators who not only require the theory, but also practical training to be able to implement the use of computers effectively in



their classrooms. One of the objectives of *Intel*<sup>®</sup> is to train educators how to integrate technology into their learning areas and not to train educators on basic computer skills. The programme aims to help educators to use the power of computer technology to spark learners' imagination, and ultimately direct them towards more effective learning. In order for computers to earn a place in classrooms, they must offer real prospects of improving what goes on in a classroom. Private initiatives such as *Intel*<sup>®</sup> gave Ga-Rankuwa educators an opportunity to learn how to teach with computers through a training programme which influenced their engagement with computers. They used different software which made knowledge and ideas available and helped them to visualise, organise and express their ideas and understanding of their learning areas in a powerful way. As a result at the end of the programme, most educators became confident that they could teach better with computers.

Educators who had basic computer skills focused on teaching skills whereas those who did not have basic skills lagged behind because their focus was on the mastery of basic computer skills. This was also evident during the document analysis. There was a vast difference between documents created by educators who came to the training with basic computer skills and those who did not have basic computer skills. The latter did not consider pedagogy, and only displayed basic skills like copying and pasting. On the other hand the emphasis of the educators who came to training with basic skills was on teaching. One educator mentioned during the interview that they did not implement the *Intel*<sup>®</sup> programme at their school because in most cases there was no electricity. In spite of all those difficulties *Intel*<sup>®</sup> did manage to influence their engagement with computers.

## CHAPTER 5

### OVERVIEW OF THE STUDY: LIMITATIONS, RECOMMENDATIONS AND FINAL STATEMENT

#### 5.1 OVERVIEW OF THE STUDY

The aim of this study was to determine how private initiatives influence the engagement of educators with ICT in selected Ga-Rankuwa secondary schools. It was established that the engagement of educators represents an important part of the South African government's strategy to improve the quality of teaching and learning across the education and training system.

The International Society for Technology (ISTE) was identified as the leading organization which supports the engagement of educators with ICT worldwide. *Intel*<sup>®</sup> on the other hand was identified as a private initiative which is currently conducting ICT training programmes in Ga-Rankuwa schools.

The need for systematic research using case study and ethnography methods to explore the influence of *Intel*<sup>®</sup> on the engagement of educators with computers at selected Ga-Rankuwa schools was also identified. The research question was formulated as: *"How do private initiatives influence the engagement of educators with computers during the uptake of ICT in selected Ga-Rankuwa secondary schools?"*. In order to answer the research question, the following sub-questions were formulated:

- How do educators engage with computers during the training programme organised by a private initiative?
- What artifacts are produced by educators during the training programme?
- Does the private initiative influence the educators' ability to function effectively in modern society?

A literature study covering the field of engagement of educators worldwide and related topics was undertaken in order to place this study within a broader framework of knowledge. It was determined that different countries are using different strategies in training educators and those strategies were discussed. Successes of ICT in general and in schools in particular were also discussed. It was realised that in South Africa, the availability of computers was still a problem in some provinces. Hence provinces were at different levels with the implementation of ICT integration in schools. Different ICT projects initiated by the government as well as private initiatives which support the engagement of educators with ICT were identified and discussed in brief.

Chapter three described the research design that was followed to gather and to analyse data. The qualitative, descriptive strategy was applied because of the nature of the research question. The research method used in this study was a hybrid of ethnography and a descriptive, interpretive case study. This study made use of three data collection techniques which included observations, focus group interviews and document analysis. Measures to ensure trustworthiness and strategies to enhance validity in qualitative research were described.

Chapter four was used for data analysis in which five categories were identified. Categories derived from data collected from the three data collection techniques were as follows:

- *The influence of basic skills on the engagement of educators with computers:* Basic computer skills were acknowledged as a pre-requisite for the *Intel*<sup>®</sup> training programme. Some of the educators did not have basic computer skills and as a result they slowed others down. Documents created by educators during the training were analysed and it was determined that those who had basic skills concentrated on teaching skills whereas the others concentrated on basic computer skills.

- *The influence of course material on the engagement of educators with computers:* It was observed that educators were given a manual and a CD in which examples of activities could be viewed by educators before creating their own activities at their schools. This course material had a definite effect on the motivation and quality of work that was created by the participants.
- *The influence of motivation on the engagement of educators with computers:* Although some educators did not receive support from their principals, the researcher noticed that they still had a positive attitude towards the *Intel*<sup>®</sup> training programme. They were excited and motivated about the programme. It was also seen during the observation that motivated educators worked together towards a goal. They helped one another to complete the activities.
- *The influence of physical resources on the engagement of educators with computers:* Availability of software, Internet, computers and electricity was identified as a factor which determined the engagement of educators with ICT integration. The lack of these resources made the engagement of educators difficult, either at the training centre or at the schools where the observation was done.
- *The influence of implementing what was learnt at the training on the engagement of educators with computers:* It was noticed that in one of the schools observed, the teacher used the computer as a tool to transfer what he had learnt from *Intel*<sup>®</sup> to his learners for science projects. This inspired the educator especially when he realised that he could solve most problems encountered by learners during the lesson.

## **5.2 LIMITATIONS OF THE RESEARCH**

The sample of 24 educators was very small, therefore restricting generalisations that could be made through interpretations of the findings in

similar contexts. In addition, educators at only one *Intel*<sup>®</sup> training center were studied and these findings cannot be generalised to educators at other centers although there are likely to be some similarities.

The *Intel*<sup>®</sup> training programme may also have provided some of the participants with an “unfair advantage” with regard to the basic computer skills that were taught as part of the training. Educators in other centers are expected to obtain these skills before registering for the *Intel*<sup>®</sup> training programme.

### **5.3 RECOMMENDATIONS**

Most of the educators (83%) did not have basic computer skills and this affected the progress of those who already had skills. Educators need to be tested for basic computer skills before registering for the *Intel*<sup>®</sup> training programme. Those who do not have basic skills should be given basic skills training before registering for the ICT integration training programme.

For a programme to be sustained, continuous training should be maintained. All educators from primary to high schools need to be trained on this programme and follow-up workshops should be conducted to make sure that educators are implementing what they have learnt at the training.

### **5.4 RECOMMENDATIONS FOR FURTHER RESEARCH**

This research has not exhausted the problem area and a variety of further research topics is possible. Some of the recommended topics for further research listed below are based upon shortcomings experienced during this study.

- Further research is needed to assess how varying educational backgrounds, abilities and basic computer skills of educators affect their engagement with ICT.

- Most of the educators did not implement what they had learnt at the training center even if computers are available at their schools. Future research needs to focus on why many educators attend ICT training programmes and do not implement what they have learnt at their respective schools.
- The research study was confined to Hebron Training College. A similar study should be conducted in other centers where all educators have basic computer skills in order to assess the extent of the engagement of educators with computers.

## 5.5 FINAL STATEMENT

In the draft White Paper on e-Education (Department of Education, 2003:10) it is stated that *“by 2013 every South African learner in the general and further education and training bands will be ICT capable”*. This can only be achieved if educators as “agents of change” are ICT capable. Asmal (1999:15) highlighted the need for increased engagement of educators with ICT for teaching and learning purposes. He further emphasised that computers must not only be put in schools, educators must be empowered to use them effectively and share what they have learnt. In response to Asmal’s call, the *Intel*<sup>®</sup> programme was introduced to Ga-Rankuwa educators to assist them with this function. There is no denying the fact that computer technology has become a necessity rather than a luxury in a classroom, as learners must be prepared for an increasingly ‘high-tech’ future. However, there are still obstacles because there are educators who still do not have basic computer skills. Clearly, a lack of basic computer skills influences the engagement of educators with computers negatively. *“We can put technology in classrooms but without committed, trained educators, this technology will be of no value”* (Asmal, 1999:13).

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## APPENDIX A

P.O. Box 332

Morula

0196

04 April 2004

The Regional Education Manager

*Intel® Teach to the Future*

Sir/Madam

### **Academic research on the engagement of educators with computers during the uptake of Information and Communication Technology (ICT)**

I am a Masters degree student enrolled at RAU (Med. Computer-based Education) and currently undertaking research into the engagement of educators with computers during the uptake of Information and Communication Technology (ICT).

Since the previous year (2003) some educators have been trained in ICT integration into teaching and learning. This study will investigate whether the knowledge acquired has influenced their teaching and learning approach.

I therefore request permission to conduct the research in your training center by observing how training is conducted and to interview trainees. Data collected will be kept confidential and will be made available on request.

Your cooperation is greatly valued

Yours faithfully

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Malefyane Tlhoale

## **APPENDIX B**

P.O. Box 332

Morula

0196

04 April 2004

Institutional support coordinator

Ga-Rankuwa cluster

Ga-Rankuwa

Sir/Madam

### **Academic research on the engagement of educators with computers during the uptake of Information and Communication Technology (ICT)**

I am a Masters degree student enrolled at RAU (Med. Computer-based Education) and currently undertaking research into the engagement of educators with computers during the uptake of Information and Communication Technology (ICT).

Since the previous year (2003) some educators have been trained in ICT integration into teaching and learning. This study will investigate whether the knowledge acquired has influenced their teaching and learning approach.

I therefore request permission to conduct the research in selected secondary schools by observing and interviewing the educator(s) in charge of the computer center at his/her most convenient time. Data collected will be kept confidential and will be made available on request.

Your cooperation is greatly valued

Yours faithfully

---

Malefyane Tlhoale

## APPENDIX C

P.O.Box 332

Morula

0196

Dear .....

I am a Masters degree student enrolled at RAU (Med. Computer-based Education) and currently undertaking research into the engagement of educators with computers during the uptake of Information and Communication Technology (ICT).

As you may be aware that there are a number of private initiatives, such as *Intel® Teach to the Future* that has designed programmes intended to assist educators in the integration of ICT into teaching and learning but, there is insufficient documented evidence of how private initiatives influence the engagement of educators with ICT.

Arising from the need to research the situation, I would like to invite you to form part of this study by consenting to be interviewed and having this interview tape-recorded for data analysis. Please note that even if you do agree to be part of this study **you are at liberty to withdraw from the study at any time, without any pressure to provide reasons.** I will also undertake all possible means to ensure that participants are **not caused any detriment by partaking in this study** and I will accordingly allocate a pseudonym to all participants to protect your identity and to guarantee that any information revealed, either personal or professional, will be regarded as absolutely confidential.

Accordingly, if you would consent to be part of this study, you will be provided with a letter which indicates that you are au fait with the conditions stated above and have consequently given your permission to take part in the interview. This letter will need to be signed and dated and returned to us as it forms part of the requirements for ethical research measures as mandated by the Ethics Committee of the Faculty of Education and Nursing.

Thanking you in anticipation

Yours faithfully

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Malefyane Tlhoale

## APPENDIX D

### CONSENT FORM

(The engagement of educators with computers during the uptake of  
Information and Communication Technology)

I, the undersigned, ..... do hereby indicate that I have read and understood the conditions for participation in the above-mentioned research as contained in the attached letter. I hereby give my written consent to be interviewed by **Malefyane Tlhoale** on the following conditions.

1. That the interview may be recorded on tape.
2. That I may withdraw from the study at any time without having to furnish reasons for such a withdrawal.
3. That I will be allocated a pseudonym in the research process and that my identity will be concealed unless I indicate otherwise in writing.
4. That I will not be caused any form of detriment by partaking in this study.
5. That I will be afforded the opportunity to comment on the finding from my interview.
6. That the researcher undertakes to store the tape/s of the interview in a locked facility.

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Signature of participant

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Date



## APPENDIX E

### **Research: The engagement of educators with computers during the uptake of ICT.**

Interview conducted with a focus group at one of Ga-Rankuwa secondary schools. 29 June 2004.

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I would like to thank each one of you for accepting this invitation and also like to welcome you to this interview session.

As I have indicated in your invitation letters, the aim of this study is to investigate the influence of private initiatives on the engagement of educators during the uptake of Information and Communication Technology. In this interview, we are going to concentrate of Intel Teach to the Future as one of the initiatives, which are currently training educators on ICT.

Now, when responding to the questions, please let us give one another a chance to speak Let us not all speak at the same time so that our views and also our voices be clear on the tape Thank you.

**Researcher:** Please tell me about *Intel<sup>®</sup> Teach to the Future* training programme.

**Respondent A:** It is a programme, which integrates technology into teaching and learning. By introducing this system makes teaching and learning effective and the children take interest. They learn more, they get more knowledge about software. They know how to use Microsoft Word, eh....how to use PowerPoint in their learning and their syllabus. They also know how to create websites about their lessons and how to use Publisher in their programme. So in this way they get more and more information and it is

beneficial for them, and they also take responsibility of learning on their own shoulders.

**Respondent B:** *Intel® Teach to the Future* is a very good programme I went through the training and I went through the manual. What I could see that was very interesting was, it encourages the teacher together with the learner to be able to work at his or her own pace, because each and every one is able to show his or her own skills of using a computer. Some teachers might be.... or some teachers might be computer illiterate, but through *Intel® Teach to the Future* they gain initiatives to learn more and to know how to use a computer as a teaching tool. Learners are also able to use it as a learning tool.

**Researcher:** How do learners use it as a learning tool?

**Respondent B:** They search for information in the Internet and from the Microsoft Encarta, as a result they learn more. So both the teacher and the learner learn in a way, they integrate. The teacher is able to take his or her own eh... subject or own learning Area and use it in the programme. Learners are also able to take information they got from their teachers and use it on the computer. So in this way I think learners ... and...eh... both learners and educators are able to integrate and are able to use the programme effectively. It helps the teacher to attend an individual learner because learners as we all know have different ways of grasping information. So, if others are slow the teacher is able to attend them individually whilst others continue with other programmes. I think it is a very good programme and it should be definitely be used in all schools from pre-schools. This programme also gives learners ..... even if there is no internet, it gives learners an opportunity to be able to search for information from Microsoft Encarta.

**Respondent C:** Ya... I think that *Intel®* is a self-paced learning where the learners determine the pace. It also gives learners an opportunity to share knowledge and enable learners to communicate through the Internet. During our training, we used the chat..... We could interact or communicate

simultaneously with other participants from our group. So, I think that we have benefited a lot from *Intel® Teach to the Future*.

**Researcher:** Have you experience any problems during training?

**Respondent B:** Yes, we have. It depends mostly on electricity. If there is no electricity it means that the training cannot continue. Another problem was that other teachers did not have basic computer skills as the results they slowed us down. We could have learnt more if most of our time was not used for basic computer skills training.

**Respondent D:** Problems that I experience at the training was that time allocated for training was very shot. Some of the teachers were not computer literate, so they had to go through the basics before they came to the programme itself. I think in future, all those teachers who will be attending this programme must be computer literate so that they only have the problem of integrating the content with technology and not have the problem of how to use the computer. One other problem was that we came to the training after school from 14h00 to 16h00, and in most cases we are tired because we are from work. Some do not attend everyday because there are meetings scheduled at schools. Some of the principals could not allow educators to come to *Intel® Teach to the Future* and leave the programmes that are already in place in their respective schools.

**Researcher:** What are your experiences in implementing the programme in your school?

**Respondent C:** My experience in implementing the programme at school level is, some of our teachers are not ready to change. Some of them do not accept changes, so they take time to come to terms with *Intel® Teach to the Future* programme. But others who are willing to learn, they just cope and are able to use it in a classroom situation. Most of our learners use computers for writing only, from there they play games. I taught learners about water, and

asked them to make different slides on the uses of water. They were excited about it.

**Respondent A:** In my school it is difficult to implement because I do not get any support from my principal. I don't know why I am attending this training course because my principal denies me access to the computers. There are only three people allowed to use computers at our school and they refused to attend the training. In some cases my principal would not allow me to leave the school's programmes that were already in place to attend the Intel® programme. I am really not motivated anymore because I am far behind other trainees.

**Respondent C:** Emm... we didn't integrate a lot in our school because of the conditions of our computers. They were broken time and again. Mmm.... The only people who got a chance for good training were teachers even though they were not exposed to integrate it in the teaching and learning situation.

**Respondent D:** Eh.... I use eh... Computer as a tool, I've learnt so many things from Intel Teach to the Future which I am using to empower my learners to prepare for science projects. Last time I gave them a project in Biology, and they prepared pictures of kidneys, pictures of heart, and pictures of ears. They also searched information from Microsoft Encarta about the diseases of kidneys, the diseases of heart and ears. They could easily do that because I have learnt this technique from Intel. Yesterday I took my students to the website (internet connection) to search for information and they were interested in searching for more information, but because of time I had to stop them.

**Respondent B:** I think I have the last contribution to make which is, if I was the minister of education, I would encourage all schools to use this programme from pre-primary up to tertiary level. If learners experience technology at an early stage, they will be able to use it at home, at school and also at their work places. I think it is a very good programme and must not be used in certain schools. It should be part of the curriculum. It should be

included in the curriculum. It is disturbing to see that some of the teachers in this era are still computer illiterate. I think with *Intel® Teach to the Future*, it can be introduced to all schools, and to all teachers. I think all teachers will take initiative of being computer literate, and every body will be able to use Intel programme in his or her Learning Area and as such we will all be computer literate.

Ladies and Gentlemen thank you very much for your time.

Thank you.

