

**TRANSFER OF LEARNING: FROM THE COMPUTER COURSE  
TO THE PRACTICE SETTING**

by

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## **ABSTRACT**

Computer literacy is the ability to use computers as tools. Computers affect peoples' lives. Hodge and Miller (1997: [Online]) describe the impact of computers in people's lives and indicate that "information and communication technologies are rapidly changing the way individuals live, firms do business, governments administer and nations interact." Mangena, the Deputy Minister of Education, claims that, "today, basic computer literacy skills are becoming just as important as acquiring literacy and numeracy skills" (DoE, 2003: [Online]).

Increasingly, teachers are also expected to use ICT for their teaching, administration and also in the classroom. In the South African situation, many teachers are ill-prepared to use computers, as they have no experience or training in this regard. However, several training programmes exist that train teachers for Educational ICT. The ultimate aim is that teachers will transfer the skills acquired at such training programmes for teaching and learning in their own contexts. Hence, the purpose of this study was to explore the ways in which teachers transfer the skills that they learnt at a computer course to their work environment.

The main findings from data indicated that a number of factors and conditions influence the transfer of skills. Primarily, the course presenter's style, course content, support from management and peers, time for practice, learning in context, students' confidence, nature and scope of assessment, accessibility to resources and conditions under which students transfer skills, have great influence in the transfer of learning.

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## **CHAPTER 1**

### **1.1 INTRODUCTION AND BACKGROUND**

It is commonly assumed that computers are used everyday. Computers change the way people think and live. For an example, when one goes to a shop, all the items are scanned with a computer. When one goes to the bank, a computer is used to process all the transactions. When one uses public transport, such as the train or bus, the ticket is processed through a computer. Hodge and Miller (1997: [Online]) confirm the impact of computers in people's lives and indicate that "information and communication technologies are rapidly changing the way individuals live, firms do business, governments administer and nations interact".

Equally important, the South African education system is affected by the use of computers for teaching and learning. Mangena, the Deputy Minister of Education, (DoE, 2003: [Online]) indicates that Information and Communication Technologies (ICT) bring rapid change to people's lives. The education system is in the transformation process, wherein the Curriculum 2005 and the Revised National Curriculum Statement have been implemented (Department of Education, 2002: 1). One of the seven critical outcomes of this new curriculum is to "collect, analyse, organize and critically evaluate information." In addition, the Draft White Paper on e-Education (2003: [Online]), envisages developing digital and information literacy skills among learners to become confident and competent in using technology to contribute to an innovative and developing South African society. This study also emphasizes that the integration of ICTs into teaching and learning to enable learners to develop advanced higher order thinking skills such as comprehension, reasoning, problem solving and creative thinking.

In order to achieve the above mentioned critical outcome, learners and educators have to be equipped with skills and resources to implement resource-based learning and outcomes based education in daily classroom practice. In this way, a solid foundation for

lifelong learning will be laid and there will be an improvement of quality of teaching and learning.

The solid foundation can be laid when teachers have been trained in ICT skills. Teachers will take the acquired ICT skills back to their work environments. However, Hodge and Miller (1997: [Online]), express their concern about ICT skills among educators, and indicated that the world is influenced by the rapid technological change, and it often penalizes some of the educators who are narrowly and inflexibly skilled. The White paper on e-Education (2003: [online]) acknowledges that the integration of computers for teaching and learning will not be easy, since some of the teachers are computer illiterate. To combat computer illiteracy amongst teachers, the Mpumalanga Education Department, with the support from other stakeholders, provides teacher computer training programmes. It is envisaged that these training programmes will assist teachers to acquire computer skills which they then transfer to their work environment, and subsequently integrate ICT into teaching and learning.



## **1.2 CONTEXT OF THE STUDY**

The primary motivation for this study is to investigate how teachers, who attend a basic computer literacy course offered by a training institution, transfer their learning to their work environment. This study proposes to describe and explore the experiences of selected teachers in a deep rural area who are currently working, while attending a course in computer skills at a former teachers college, which now functions as an Education Multi-Purpose Centre (EMPC). The participating teachers attend the course in the afternoon, for two hours a day, two days a week. Teachers pay R250 from their own pockets to complete the course. If participants are successful in the final assessment, they are awarded certificates after completion of the course, although the course is not SAQA registered.

Surprisingly, it became known to the researcher that some of the teachers who attended the computer course at the EMPC still ask their colleagues to type personal letters for

them on the computer. Therefore, the question arises: Why do these trained teachers not type the letters themselves? Are they unable to use the computer independently and effectively? It can only be assumed that they ask for assistance because they cannot type the letters themselves. This would place a question mark on the effectiveness of the computer literacy programme that they attended at the EMPC. It would then appear that adequate learning has not taken place in the EMPC. If the learning has been adequate, one would assume that they could type their personal letters and therefore they would be able to transfer their skills to their work environments.

All the participants in this study are black teachers, teaching in “deep rural” schools in Mpumalanga. Looking back at the South African apartheid education system, “the system has left a wide discrepancy in the technological preparedness of black and white students” (Motaung 2002: 4). Motaung further reports that white students have been exposed earlier and more widely to information technology than their black counterparts. That could possibly explain why all of the participants in this study did not have an opportunity to be exposed to computer literacy.

It could commonly be assumed that many teachers from the deep rural areas in South Africa are computer illiterate (compare chapter 2 figure 2.3.1), wherein Mpumalanga is the sixth province in South African schools with computers. However, the number of computer literate teachers is probably increasing because of various ICT skills development programmes that are underway. Take the case of the ‘Intel Teach to the Future’ ICT programme, which envisaged that 40 000 teachers would have been trained by 2003. It is assumed that the trained teachers from these programmes would transfer their learning to their workplace. However, little is known about the transfer of skills learnt to the work place.

The following will highlight the necessity of this study:

## **1.3 THE CURRENT DEBATE**

### **1.3.1 The need for teachers to have ICT skills**

“Today, basic computer literacy skills are becoming just as important as acquiring literacy and numeracy skills” (DoE, 2003: [Online]). The South African Education Department wishes to integrate computers in education system, but it is not easy. The Digital partnership, National Institute for Crime Prevention and Reintegration (Nicro) and Vodafone Group Foundation outlined the importance of ICT, by contending that ICT skills “can help raise the quality of education in schools by increasing the range and scope of information accessible to them, while having ICT skills equip school leavers with the tools to function effectively in today's information society” (2004: [Online]). They continue by explaining that “the widespread availability of ICT skills in the population of any country is an essential ingredient to the development of a knowledge-based society that can compete within today's global information economy”. Furthermore, the importance of providing teachers with ICT skills to meet the demands of the 21<sup>st</sup> century and beyond is contended (DoE, 2003: [Online]). It has been noted that there is an increasing demand for public access facilities, therefore, it is necessary to provide public education in ICTs (Zinn, 2000: [Online]).

Unquestionably, computers are commonly used everyday. In addition to the common use of computers, Bannett, the President and Chief Executive Officer of Intel, confirms the use computers by contending that “in the world increasingly dependent upon technology - whether at home or in the workplace - it is important that computers are made part of everyday teaching”. For the same reason that computers are made part of everyday teaching, teachers and learners need to be technological literate. Although there is an assumption that the South African Department of Education have started introducing computers in the classroom, researchers claim that only a few educators feel well prepared to integrate technology into their subjects (Candau, Doherty, Yost & Kuni, 2004). The inability of some teachers to integrate ICT skills into subjects raises the question of whether teachers do transfer ICT skills from the training programmes to their work environments.

Equally important, the education system is influenced by the rapid change that Information and Communication Technologies bring to people's lives. Although it is commonly said that many basic and professional IT skills are acquired through informal means either at work or at home, formal education remains an important component of the learning process (Zinn, 2000: [Online]).

Digital Partnership SA (2004: [Online]) confirms the importance of ICT in education by highlighting that "in order for technology and the Internet to be used effectively, educators and social enterprises must know how to apply technology to facilitate access to and use of information and communication for economic and social development". Digital Partnership SA furthermore argues that schools, students and educators, as well as community enterprises, can use reconditioned technology and the Internet for learning and personal development.

### **1.3.2 ICT teachers' training programmes**

Many ICT programmes are run to equip teachers with necessary skills for the 21<sup>st</sup> century. For an example, Microsoft South Africa runs a teacher's skills training programme that encourages teachers to plough back the skills they gained from the course into their daily teaching practice, (DoE, 2003: [Online]). Researchers claim that the ends of education and training are achieved when transfer occurs. It is furthermore indicated (Zinn, 2000: [Online]) that SchoolNet South Africa, in partnership with education, public, private and community donors, are trying to implement ICT to the education sector successfully. Furthermore, Intel Teach to Future is a worldwide teacher training programme that is aimed at utilizing ICTs to support educational transformation. Gauteng-On-Line trains Gauteng educators in ICTs, and two educators per school in technical administration. Similarly, Thintana I-learn project trains teachers in ICT skills in the former disadvantaged schools throughout the country. Furthermore, Thintana project also trains two teachers per school for technical administration. In addition, the Telkom Foundation SuperCentre Project, trains teachers in ICTs and two teachers for technical administration as well. Nortel Phumelela Networks Project and provides Internet access in the historically disadvantaged communities in three provinces,

Limpopo, Gauteng and Eastern Cape. Most teachers' colleges in Limpopo presently function as Education Multi-Purpose Centres (EMPCs) and offer basic computer skills. Most South African universities offer teachers' ICT skills programmes. All these programmes aim that teachers are motivated to acquire and develop ICT skill which they will then transfer skills to their workplace.

### **1.3.3 The importance of transfer**

Rowland and Reigeluth, quoted by Beard (1993: [Online]), define transfer as an assumption that learning within a certain context and the impact that learning has beyond that context. However, studies show that very often the hoped for transfer of learning from learning experiences does not occur. Transfer may be impeded by the difference between context of learning and contexts of application at home or job. Transfer is a complex phenomenon and must not be taken for granted (Beard, 1993:3).

Researchers argue that there is a gap between learning and transfer of learning. However, Kirkpatrick identified four levels of evaluation, namely: reaction, learning, behaviour and results that may be used to evaluate transfer. On the other hand, Haskell (2001: 30) identified six levels of transfer: non-specific transfer, application transfer, context transfer, near transfer, far transfer and displacement or creative transfer.

It is within the context of transfer that this study is undertaken. The specific thrust of the investigation is to explore the learning experiences in Educational ICT of a selected group of teachers in a deep rural area in the Mpumalanga province against the background of transfer. In Chapter two, the concept of transfer is discussed in more depth.

### **1.3.4 Factors that influence transfer of learning / training**

Researchers claim that there are a number of factors that influence transfer of learning. Phillips (1997:9) identifies support from the management as one of the factors that affect transfer of learning to the workplace that influence transfer of learning to the workplace.

Furthermore, Phillips and Broad (1997:12), ranked nine categories from highest to lowest on barriers of transfer, namely: lack of reinforcement on the job, interference in the work environment, non-organizational structure, trainees' view on training as being impractical or irrelevant, trainees discomfort with change, poor training design and peer pressure against change.

Consequently, Beard (1993: [Online],) identified student characteristics, instructional design, work environment, degree of learning and retention to be the contributing factors in positive transfer. On the other hand, Machin and Fogarty (2003: [Online]) argue that trainees' perceptions of various transfer enhancing activities, trainees level of learning during training influence the transfer of computer skills.

### **1.3.5 Conditions of transfer**

Studies have shown that transfer may depend on extensive practice of the performance in question in a variety of contexts. In contrast to the extensive practice, literacy and education has been found to have major influence on a number of cognitive measures (Schwartz, Vol 4: 2485). Secondly, studies have indicated that transfer also depends on whether learners have abstracted critical attributes of a situation. Therefore, it can be concluded that explicit abstraction in a particular learning situation fosters transfer.

## **1.4 RESEARCH PROBLEM**

It has been clearly explained that ICT teacher training programmes are currently taking place throughout the public and private sector. Phillips and Broad (1997: 3) contends that 50% of all training content is not applied after training. On the other hand, Nisbett cited by Beard (1993: [Online]), claims that the research on transfer from school to out-of-school learning, or even between school subject matters, has produced disappointing results. Nisbett's claim is further affirmed by Beard, who indicates that there has not been much evidence that what is learned in one setting is spontaneously applied in another (Schwartz 1987:379). Beard further contended the fact that "transfer is not how

knowledge or skill is transported ‘whole’ from one setting to another, but how learning and performance in one setting prepare one to learn the rules, habits, and knowledge to a new setting” [Online].

Mention was made that the participants are from the deep rural area where teaching and nursing were the only job opportunity that was open for Blacks. An analysis in accessibility of computers to South African citizens shows that Blacks had limited access. The inaccessibility of computers to Blacks has been promoted by the highly unequal apartheid educational system and restricted job access in the past that served to limit the human capital development of Blacks in particular, leaving the South African labour market heavily skewed in favour of whites despite the fact that they constitute only a small proportion of the population (Zinn, 2000: [Online]). This is further confirmed by Zephr (2000: [Online]) who states that “the less skewed racial distribution of nursing and school teaching are the result of these professions being the only two that were really open to Blacks during the apartheid era”. Teaching and nursing were considered as the only ones open to Blacks, and as such, IT skills were not necessary.

All participants of this study, Black teachers from the deep rural area of the Mpumalanga province, have no computer skills. They attended a computer skills course at the EMPC for a year, where the course consisted of two modules, MS Word and MS Excel. Some of the students who have completed the course are my colleagues, but cannot type their personal letters, and still ask me to type their letters. They do not know how to apply the skills they learned at the EMPC in context of their everyday teaching.

Within the context explained above, the purpose of this study is therefore to explore **how teachers transfer learning from the computer course to practice setting**. In order to get answers to this question, the following secondary questions will help to answer the primary research question:

- What is the meaning of ‘transfer of learning’?
- What are the conditions for the transfer of learning?
- What are the ways in which transfer takes place?



- What factors affected transfer in the context of this study?

## **1.5 AIMS AND OBJECTIVES**

The aim of this study is

- to determine if school teachers transfer the skills learnt in a basic computer course to their working environment and
- to identify the factors that played a role in the transfer of these skills.

The following objectives are set:

- To undertake a study of the literature to determine an understanding of the concept ‘transfer of learning’
- To determine by means of literature review, the conditions for transfer of learning
- To find out in what ways transfer took place
- To identify the factors that influence the transfer of learning

## **1.6 OVERVIEW OF THE METHODOLOGY**

### **1.6.1 Research approach**

The research approach of this study is qualitative. Data will be collected in words, trying to understand the social situation of the participants in order to obtain a complete picture of all the participants in this study.

### **1.6.2 Research method**

I will adopt case study research design for this study. Leedy and Ormrod define a case study as “a particular individual, programme, or event that is studied in depth for a defined period of time” (2001:159). Furthermore, Bell defines case study as “an umbrella term for a family of research methods that have common purpose on inquiry around an instance” (2000: 19).

### **1.6.3 Data collection techniques**

Qualitative research uses multiple forms of data collection techniques in one study, but for this study the following methods were used:

#### **1.6.3.1 Examination results**

The participants in this study have written examination to assess them if they have acquired computers skills for them to transfer to practice setting.

#### **1.6.3.2 Observation**

The participants were observed in their workplaces for a period of time. Leedy and Ormrod (2001: 25) emphasise flexibility as the primary advantage of observation. Contrastingly, Leedy and Ormrod indicate the disadvantage of observation by the saying that the researcher's presence may alter what people say, do and how significant events unfold. They further suggest that the researcher must not confuse the actual observation with the interpretations of them.

#### **1.6.3.3 Interviews**

Semi-structured focus group interviews with teachers, followed by key informant interviews with selected teachers from this group to explore emerging themes, were conducted.

### **1.6.4 Data analysis techniques**

Data was analysed as outlined by Leedy, citing Creswell (2001: 150) in the following steps:

- Organisation of details about the case. The specific facts about the cases are arranged in logical order
- Categorization of data. Categories are identified that can help cluster the data into meaningful groups.
- Identification of single instances. Specific occurrences and other bits of data are examined for specific meanings that they might have relation to the case
- Identification of patterns. The data and their interpretations are scrutinized for underlying themes and other patterns that characterize the case more broadly than a single piece of information can.
- Synthesis and generalizations. An overall portrait of the case is constructed. Conclusions are drawn that may have implications beyond the specific case that has been studied.

I looked for the convergence (triangulation) of the data that I collected. I interpreted data by what Neuman, cited by Leedy and Ormrod calls “relating my results and findings to existing theoretical frameworks or models and show whether these data are supported or falsified by the new interpretation”. (2001:159). As I analysed the collected data, those pieces of information helped me to draw my findings to some conclusion. The ‘usefulness’ of this inquiry was based on constructed knowledge (from participant’s lived experiences) and in the writing up of the inquiry.

## **1.7 STRUCTURE OF THE RESEARCH**

This study is set out in the remaining chapters as follows:

- Chapter 2 is the overview of the relevant literature
- Chapter 3 contains the research design
- Chapter 4 contains data reporting and analysis
- Chapter 5 consists of the summary, conclusion, limitations of my research and suggestions for future research.

## **1. 8 SUMMARY**

This chapter introduced the research study and contextualized it within the educators attending a computer skills course at the Education and Multi-Purpose Centre (EMPC the former teacher's college). The problem that I investigated was explained. It was established that educators attend a computer course at the EMPC, but they cannot transfer the skills to their teaching practice. Therefore, the effectiveness of the course is in doubt, which is why the study has been undertaken. The current research provided explanation of transfer and factors that affect transfer of learning. The context was used to identify the research question while the remainder of the chapter provided the structure of the study. The following chapter, Chapter 2, provides a review of the relevant literature.



## CHAPTER 2

### OVERVIEW OF THE RELEVANT LITERATURE: TRANSFER OF LEARNING / TRAINING TO THE WORKPLACE

#### 2.1 INTRODUCTION

The literature review will clarify the nature, scope and manifestation of the focus area in question, namely the **transfer of learning by school teachers between a basic computer course and their teaching practice**. Although the phenomenon of transfer of learning is complex, the sources that I have consulted will help to clarify it. The in-depth study will lead to the greater understanding of the way in which teachers attending the basic computer course transfer their learning from the computer course to their practice settings. The present study is limited to an investigation of teachers who attended basic computer literacy course at the former teachers college now called the Education Multi-Purpose Centre (EMPC).



The aim of this chapter is therefore to set the contextual background of the study wherein the following key issues are discussed:

- Importance of ICT skills for educators
- The South African context : ICT skills for educators
- Transfer of ICT skills to the teaching practice
- Summary

#### 2.2 IMPORTANCE OF ICT SKILLS FOR EDUCATORS

It is argued that the information age which in people live, requires them to have ICT skills. The need for people to have ICT skills is affirmed by Hodge and Miller (1997: [Online]) who indicated that “information and communication technologies are rapidly changing the way individuals live, firms do business, governments administer and nations

interact”. Take an example of one of the critical outcomes identified in the new curriculum, where the learner must be able to “collect, analyze, organize and critically evaluate information” (DoE: 2002:1), which has to be mediated by educators.

In comparison, some years back, ICT skills were not considered as important as they are at present. Beard (1993: [Online]) confirms the importance of ICT skills and contends that “learning about computers has been recognized as a prescription for the developing and productive workforce” (Beard 1993: [Online]). However, computers have recently become part of people’s lives and they have an impact on their lives. The impact of computers is experienced in most spheres of life, as increasing more jobs are computerized each year (Beard, 1993: [Online]) and this makes the world to dependent on technology. Furthermore, the National Institute for Crime Prevention and Reintegration (Nicro) argues that “the widespread availability of ICT skills in the population of any country is an essential ingredient to the development of a knowledge-based society that can compete within today's global information economy” (Hodge & Miller, 1997: [Online]).

Education is one sphere of life which is affected by ICTs. One can assume that education in ICT skills can play an important role in the development of most nations. It is important to recognize as the United Nations Educational Scientific and Cultural Organisation (UNESCO) points out “that the use of information and communication technologies (ICTs) in and for education is rapidly expanding in many countries, and is now seen worldwide as both a necessity and an opportunity” (UNESCO, 2006: [Online]). According to the Dakar Framework for Action, the use of new information and communication technologies is identified as one of the main strategies for achieving the EFA (Education for All) goals (UNESCO, 2006: [Online]).

Unquestionably, computers are commonly used everyday and computers in schools have a vital role to play by becoming part of everyday teaching, however teachers and learners need to be technological literate. As previously explained, Bannett, the President and Chief Executive Officer of Intel, has confirmed the increasing global use of technology and consequently states that “it is important that computers are made part of everyday

teaching” (Candau, Doherty, Yost & Kuni 2004:3) to equip learners to take their place within this technological world.

Secondly, take the case of Warschauer, whose research on integration of computers into subjects, observed that teachers do not integrate computers into teaching and learning, but students use multimedia rooms, by sitting and watching the teacher lecturing, as usual, but with the aid of a CD for presentation (Zehr, 2004: [Online]). Voogt, a Netherlands education researcher, told Education Week that most teachers have basic technology skills, but lack the knowledge of integrating them into their subject areas (UNESCO, 2006 [Online]). Yet, research indicates that integration of technology with integrated knowledge methods courses increase the transfer of computer skills by educators to their classroom as compared to those who learned computer skills in an isolated manner (Halpin, 1999:1)

In spite of the slow rate of integrating technology into classroom, the importance of ICT is further contended by Taylor and Francis cited by Halpin (1999: [Online]), who indicate that ICT can be used as a pedagogical tool. In addition, the Digital Partnership, National Institute for Crime Prevention and Reintegration (Nicro) and Vodafone Group Foundation confirmed that ICT skills “can help raise the quality of education in schools by increasing the range and scope of information accessible to them, while having ICT skills equips school leavers with the tools to function effectively in today’s information society” (UNESCO, 2006: [Online]).

Researchers claim that ICT skills facilitate learning. Educators can use ICT skills to prepare learning programmes that present information, guide learners, give learners the opportunity to practice the presented information and retain it and lastly, the educator can assess learning (Alessi & Trollip 2001: 10). Furthermore, learning can be facilitated by using the Internet, wherein ICTs can be used to globalise education. Learners have access to a variety of sources for information. However, learning is not easily facilitated, for there is a shortage of people skilled in quality courseware and disagreement within the education field on how computers should be used in education (Alessi & Trollip 2001:5)

Undeniably, ICT skills support and enrich learning. Holliman and Scanlon argue that “ICTs enable new resources for learning, new modes of instruction” (2004:21). The enrichment of learning helps educators and learners to achieve the educational goals. Contrastingly, survey on the use of ICTs indicates that ICTs do not ensure achievement of effective and appropriate learning outcomes, but ICTs enable new forms of teaching and learning (Kirkwood, Adrian, Price & Linda, 2005:1 [Online]). That means educational purposes and pedagogy address the students’ need to understand the benefits of using ICTs, and not only how to work with ICTs (Kirkwood & Price, 2005:1 [Online]).

Educators can expand and upgrade their teaching skills. The expansion of educators’ teaching skills helps to raise the quality of education, by increasing the range and scope of information accessible to them (UNESCO, 2006: [Online]). The Beep Team points out that while teachers can use knowledge as their primary source, ICT can enhance their ways of working. (Beep Team, 2003: [Online]). ICT skills for teachers can be used for designing and running a school website, running and maintaining the school’s ICT equipment, designing and running information security solutions, developing educational multi media material or video-conferencing (Beep Team, 2003: [Online]).

Educators may use ICTs for economic and social development. Moreover, ICTs are important for personal growth. Learners will be able to participate actively in the knowledge economy and information society, further their education and seek better jobs (UNESCO, 2006: [Online]). Dadebo emphasized the importance of computers and argues that “if we really want to move with those who have gone ahead, we simply have to use information computer technology in education” (Zehr, 2004: [Online]).

Although it is commonly assumed that many basic and professional ICT skills are acquired through informal means either at work or at home, formal education remains an important component of the learning process (Zinn, 2000[Online]). However, researchers claim that computer literacy in the long term can be addressed through the public education system and not training subsidies to industry which benefits some part of the population (Zinn, 2000: [Online]).



The importance of ICT skills may be realized in situations where there is a transfer of the ICT skills. Beard (1993) raises a concern where he wants to know the way in which computer knowledge can be transferred positively to the future technological challenges ([Online]). Beard further argues that it is a concern which becomes increasingly important in a world where rapid technological change often penalizes those who are narrowly and inflexibly skilled (Beard, 1993: [Online]).

Furthermore, the Digital Partnership cited by Zehr, (2004:[Online]). suggested some ways in which to bridge the gap between people who have ICT skills and those who do not have, which requires the delivery of four key components:

- access to affordable equipment and appropriate software;
- telecommunications links with Internet connections;
- technical assistance, training and education; and
- access to relevant content

Similarly, the South African Department of Education argues that there is a need to “bridge the gap between the varied information needs and skills to access the curriculum to ensure effective use of the skills and the development of the literacies is essential for the implementation of resource based learning and development of lifelong learning, broadly categorized as information literacy and digital literacy” (DoE, 2003 [Online]).

In the above section, the words *ICT skills* have been used many times. In order to understand the words: ICT skills, the definition of skill, literacy, and computer literacy will be provided.

### **2.2.1 Meaning of skill**

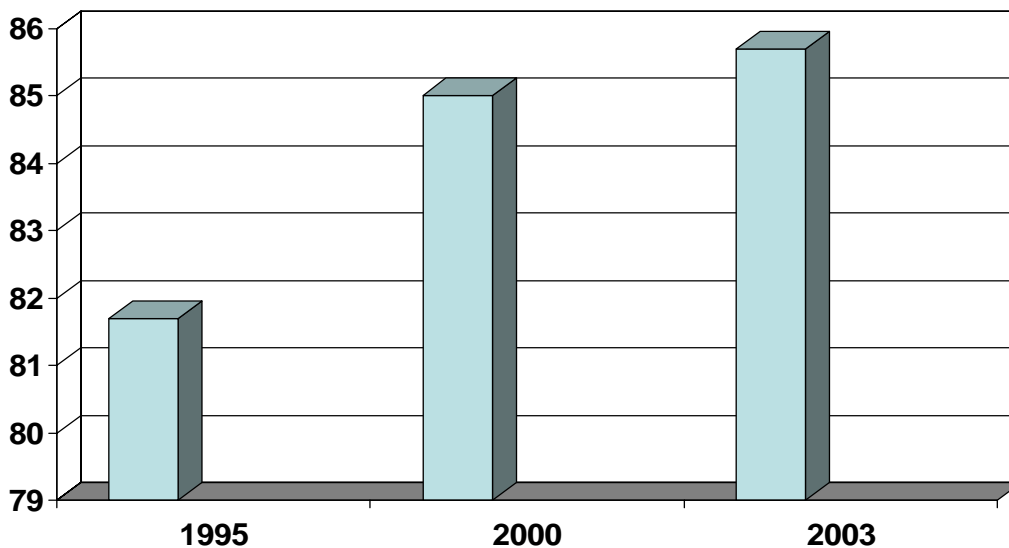
Skill can be defined as the art or technique of doing something acquired after learning for some period of time. For an example, a person can be born with a talent, but he/she still needs to learn the art of using his/her talent. In the literature that I consulted, skill is defined as a “physical, social, mental, ability acquired mainly as a result of practice and

repetition” (Lawton & Gordon, 1996:215). A skill is further defined by Lawton and Gordon, as a “state of being aware of how sure we are of what we know, and what our reasons are for believing it to be true” (1996:216). The two definitions made an impact in my research forming the basis of my research topic, since my study is about transfer of learning from a computer course to the work environment. I argue that a skill is learnt, that is to say if one has to acquire a certain skill, then one has to undergo a process of learning. Beard argues that a skill learnt in one situation does not guarantee easy mastery of another (1993: [Online]).

I also consulted sources in which the definition of skill is in contrast with the definition in the above paragraph. Glaserfeld cited by Halpin, contends that “concepts, ideas and meanings cannot be directly transferred from one person to another, but must be abstracted from individual experience” (1999:215) which means that transfer of skills depends on the individual’s way of learning. One can learn a specific skill, but this skill cannot be learned in vacuum, the context and the application needs to be taken into account. For example, one may learn driving as a skill, but still has to drive in order to develop the skill. Similarly, my study is based on the transfer of learning by teachers from the computer course to their practice setting, hence, literacy and computer literacy will be explained.

### **2.2.2 Literacy**

Literacy is the ability to read and write (Kavanagh, 2002: 676). Figure 2.1 indicates the literacy percentages of South Africans.



**Figure 2.2. 2.1 South Africa-Literacy (%)** (Source: CIA World Factbook 2005: [Online])

It is regrettable to notice from the above chart that South Africa still has some of its population who cannot read and write. The impact of the presence of illiterate people in South Africa, can lead to inaccessibility of computer skills. The CSS Human Development suggests that a long term solution would be to increase the percentage of literate people and for the short term solution, development of voice-text programmes, so that they could access the information without reading (Zinn, 2000: [Online]). It is claimed that literacy is one of the conditions on which transfer of learning depends (Luria cited by Schwartz, 1976). For the purpose of this study, literacy is considered as one factor that influences the transfer of learning by teachers from the computer course to the practice setting.

### **2.2.3. Computer skill**

Computer skill is defined as “the fundamental set of abilities involved in operating a computer system as an informed user”(Beard, 1993 [Online]) The abilities include being able to “use preprogrammed software packages in personal, academic, and professional contexts” (Online: 1993). The ability to operate computer system, results in being computer literate.

### **2.2.4 Computer literacy**

Computer literacy is the ability to use computers as tools (Beard, 1993: [Online]). Furthermore, computer literacy is a requirement to use information technology and to interpret the information that it provides (Hodge & Miller, 1997: [Online]). “The most important indicator of the population’s ability to use IT is computer literacy”(Beard, 1993: [Online]). Similarly, Internet access is another indicator of being computer literate. Even though South Africa had a low percentage of computer literate people over the years, reports indicate an improvement in computer literacy in the population. The ICT World Telecommunications Indicators Database has indicated that by the end of 2004, less than 3 out of every 100 Africans use the Internet, compared with an average of 1 out of every 2 inhabitants of the G8 countries (Canada, France, Germany, Italy, Japan, Russia, the UK and the US) (ITU 2005: [Online]). This aligns with the Computer National School survey which indicates that the majority of teachers and learners are not comfortable in the ICT culture, yet a number of schools want to offer learners the opportunity to become competitive in a global market (Zinn, December 2000 [Online])

It is estimated that the number of schools with computers for teaching and learning has increased from 12.3% in 1999 to 26.5% in 2002 (Zinn, 2000: [Online]). The Final Report of the Digital Initiative ranks South Africa as the highest in Africa to have Internet connectivity but the rural areas are still left behind. Although there has been global progress in improving access to Information and Communication Technologies (ICT), poor countries still lag behind in making ICT applications commonplace in governments, schools and business (UNESCO, 2006: [Online]). Although the number has increased there were still more than 19 000 South African schools without computers for teaching and learning in 2002. Only 6.4% of South Africans have access and use of the Internet, while 72.7 % of Americans have access to and use the Internet daily. This study investigates teachers whose schools have limited number of computers, and some have no computers, which is one factor that influences the transfer of learning.

### **2.2.5 Information and Communications Technology**

Motaung quotes Nolte and defines ICT also known as Information Literacy as the “ability to identify what information is needed and the ability to locate, evaluate and use information” (Motaung 2002:28). Furthermore, ICT is “the combination of networks, hardware and software as well as the means of communication, collaboration and engagement that enable the processing, management and exchange of data, information and knowledge” (DoE, 2003: [Online]).

### **2.3 THE SOUTH AFRICAN CONTEXT: ICT SKILLS FOR EDUCATORS**

As indicated in the last section that an increase in demand for public access facilities, necessitate the provision of public education with ICT’s. Education can be assumed as the key role player in addressing ICT.

However, the use of ICTs is one of the challenge facing South African teachers. The challenge, confirmed by Van der Westhuizen, cited by Motaung, asserts that “the information age we live in, demands skills and coping mechanisms that were previously unnecessary” (2002:3). Van der Westhuizen further argues that Information Technology and computers have changed the way humans live and work (Motaung, 2002:3). The necessity to acquire and develop computer skills is confirmed by Turkle (2004), who says that “today, students use e-mail, word processing, computer simulations, virtual communities and PowerPoint Software to learn new ways to think” ([Online]). This importance is confirmed by Mangena who contends that all schools should be well resourced with technological equipment and the ability to utilize them fully, “so that all learners become confident and competent in using technology to contribute to an innovative and developing South African society” ( DoE, 2003 [Online]) .

However, being technologically literate does not guarantee a quality education. Bannett has stated that even though Education Department in South Africa has started introducing computers in the classroom, the studies show that only some educators feel well prepared to integrate technology into their learning areas (Candau, Doherty, Yost & Kuni 2004:3) and below is a table which confirms Candau et al’s argument (DoE, 2003 [Online]).

Table 2.3.1: South African Provinces and computers in schools (2003)		
Province	Schools with computers	Schools with computers for teaching and learning
Eastern Cape	8.8%	4.5%
Free State	25.6%	12.6%
Gauteng	88.5%	45.4%
KwaZulu-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>

It can be deduced from the table that some school do have computers, but they are not used for teaching and learning.

Although schools have been equipped with computers, the education system has been slow to meet the market needs, wherein South Africa is the second among the African countries, but behind Egypt (DoE, 2003: [Online]). It can be argued that even though some South African schools are equipped with computers, the question should be asked whether they are indeed used for teaching and learning. The South African Department of Education argues that computers have been introduced into the classroom in some South African schools, but 26,5% are used for teaching and learning (2003 [Online]), although the Digital Opportunity Initiative report states South Africa lacks relevant content and applications for the integration of ICT in education (DoE, 2003: [Online]). Teachers need ICT skills and relevant knowledge to integrate computers into their learning areas. Thus, if the teachers are empowered to understand how the ICT skills fit into the context of teaching and learning, then they may be motivated to transfer these ICT skills to their teaching practice.

ICT skills are vital to improve the quality of teaching and learning in South Africa. The ISAL newsletter indicates that the utilization of technological equipment by teachers relies on their ability to understand how to access and use common information sources like libraries, community resource centres and the Internet (Zinn, 2000: [Online]). Thus basic computer literacy skills for teachers and learners are becoming just as important as acquiring literacy and numeracy skills. South Africa as a developing country needs to ensure that its people have the relevant skills and be technological ready in order to meet the 21<sup>st</sup> century challenges and beyond (DoE, 2003: [Online]). The South African Education Department has attempted to find ways in which ICT could be used to stimulate and enrich learning and enhance teaching, and support administration and the management of schools.

Zinn indicates in the ISAL Newsletter that the South African education system's aim is to use ICT literacy to "make youth take full responsibility for the nation's economic development" (2000: [Online]). Youth can take the responsibility if the feasibility of interactive learning using ICTs (between teachers and learners, between computer-based software applications and learners, and among teachers and learners themselves) is becoming a reality for some people in South Africa as a developing country (e-Education IRRISS & Directorate, 2005: [Online]).

Digital Partnership SA confirmed the importance of ICT in education by highlighting that in order for technology and the Internet to be used effectively, "educators and social enterprises must know how to apply technology to facilitate access to and use of information and communication for economic and social development" (SALRU Living Standards and Development Survey, 2000: [Online]). Digital Partnership SA further argued that schools, students and educators, as well as community enterprises, can use reconditioned technology and the Internet for learning and personal development (SALRU Living Standards and Development Survey, 2000: [Online]).

The IT Human Resource indicates that "a good indicator of the prevalence of IT skills within the workforce is to examine the number of IT professionals per 1000 of the workforce" (Hodge & Miller, 1997: [Online]), estimating that South Africa has grown

from 3.3 per 1000 in 1989 to 4.9 in 1995. IT Human Resource further indicates that “IT professionals are an important component of a country’s IT industry as it determines the ability of a country to install new technologies and develop useful applications” (SALRU Living Standards and Development Survey, 2000: [Online]). Below is the table that indicated the number IT professionals in South Africa from 1989 until 1995. However, in the intervening years the number has been seen to grow yearly.

**Table 2.3.2: Total number of IT Professionals**

<b>Year</b>	<b>Total IT Professionals</b>	<b>No. per 1000 of workforce<sup>1</sup></b>
1989	17 309	3.3
1992	21 131	4.2
1995 <sup>2</sup>	25 000	4.9

(Hodge & Miller citing CSS Source, 1997: [Online]).

Researchers claim that a factor contributing to the low percentage of IT professionals is the provision of IT education at the primary and secondary level in South Africa. IT education should allow learners access to computers and equip them with basic computer literacy skills by providing basic programming skills at the level of Standards 8 to 10 (16-18 year olds) (Zinn, 2000: [Online]). However, with the introduction of the White Paper on e-learning (DoE, 2003: [Online]), the Department of Education is attempting to address this deficit as the need for IT professionals affects the teaching profession as well but more specially in the Black and rural communities.

It can be deduced from Table 2.1 that there is a shortage of Black IT professionals or ICT teachers. IT Human Resources estimates that 25% of people with tertiary education are in nursing and education where computer training and work usage is very low (Zinn, 2000: [Online]) and in addition, researchers has found that it is common for teachers who completed IT courses, leave the teaching profession to take up positions within the IT world.



The use of ICT lies in the ability of the rest of the population to utilise the power of IT in their daily work and leisure lives (Zinn, 2000: [Online]). However, the full utilization of IT can be problematic since the majority of information resources are only available in English. This could prove to be a barrier as South Africa, being a multi-cultural nation, has eleven official languages. Thus, many people, fluent in their home languages, may not be fully literate in English which may impact on the acquisition of ICT skills.

As many South Africans may be faced with the challenge of utilizing ICT resources adequately, the IT Human Resource (SALRU Living Standards and Development Survey, 2000: [Online]) laid down some solutions for the full utilization of IT resources. They suggest that putting more information resources in other languages, developing language conversion software to translate English resources and teaching English to everyone even as a second language, may be possible solutions to this language problem (SALRU Living Standards and Development Survey, 2000: [Online]).

However, each suggested solution has its own consequence on the accessibility of information. Teaching English to everyone is not practical and is not culturally sensitive either. Contrary to teaching English as a second language is the language policy that South African Education system uses currently. According to the language policy in South African Education Department, all the Foundation phase learners have to be taught in their mother tongue. The policy automatically excludes the foundation phase learners from accessing English technological resources, despite their computer literacy skill. Putting more information resources in other languages, is a possible solution for South African based information resources, yet the problem lies in access to resources from the rest of the world. Obviously, the large number of languages spoken in South Africa may make this impractical. The second option may be the best solution, as it will result in access to all world-wide resources and allow users to select their preferred language. It will also provide the scope for putting more South African information resources into languages other than English, with no duplication in English, as then the English speakers can access these resources as well (SALDRU Living Standards and Development Survey 2000: [Online]).

Hodge and Miller (1997: [Online]) have argued that the extent and quality of IT education through formal public and private institutions as well as formal and informal “on the job training” will determine the country’s accumulation of IT skills over times. Their argument is pertinent to the South African context and in response the Department of Education has issued a policy for Information Technology laid down in the White Paper on e-Education.

### **2.3.1 e-Education policy (White Paper on e-Education, 2003 [online])**

The main goal of the e-Education policy is to enable every South African learner to confidently use ICTs and creatively help develop the skills and knowledge they need to achieve personal goals and to be full participants in the global community by 2013 (DoE, 2003: [Online]). The South African Department of Education realized the importance of ICT skills in teaching and learning and has therefore outlined suggestions on the implementation and integration of ICT in schools, by enhancing system-wide and institutional readiness to use ICTs for learning, teaching and administration. The enhancement to use ICT may be achieved through the National framework of integrating ICTs in pre-service and in-service training for managers, educators and administrators. The Department of Education further aims to build an education and training system to support ICT integration in teaching and learning, in order to build teachers' and managers' confidence in the use of ICTs. The Department of Education also aims to build a framework for competencies for teacher development in the integration of ICTs into the curriculum, by revising norms and standards for educators in order to include ICT use and integration for teaching and learning. In addition, the Department aims to establish an ICT presence in schools, by supplying schools with ICT facilities and using education content of high quality. Lastly, the Education Department aims to ensure that all school are connected and have access to the Internet so they may communicate electronically, by involving the communities to support ICT facilities in order to sustain them.

It thus becomes clear that people must have an access to computers and be able to utilize them (Hodge & Miller, 1997: [Online]), so the next section will highlight some points on the accessibility of computers.

### 2.3.2 Accessibility of computers

World Bank Economist, Christine Zhen-Wei Qiang, points out that developed nations have more than 300 servers per 1 million people, but developing nations have fewer than 2 (UNESCO, 2006: [Online]). An analysis of accessibility of computers to South African citizens, shows that Blacks had limited access and this was promoted by the highly unequal apartheid educational system and restricted job access with the only job opportunities open to Blacks in the past being teaching and nursing. This served to limit the human capital development of Blacks in particular, leaving the South African labour market heavily skewed in favour of whites despite the fact that they constitute only a small proportion of the population (Zinn, 2000 [Online]).

The impact of the previous education system has influenced the population of IT professionals as limited access to the development of IT skills was given to learners. This was particularly evident in the 1980s with the unrest in the schooling system resulting in the so-called 'lost generation' of Black youth who acquired even less education than their predecessors making it more difficult to enter the IT profession (Zinn, 2000: [Online]). This has resulted in an interesting demographic profile of the IT professional population with estimates showing that roughly 2/3's of all IT professionals are male whilst males constitute only 52% of the entire professional workforce. On a racial level, the IT industry is dominated by whites who make up 83% of the industry even though they constitute only 13% of the population and 53% of all professionals. The greatest level of exclusion is amongst Blacks who make up only 3% of the IT professionals yet account for 33% of all professionals and 76% of the population. The proportion of Asian and Coloured IT professionals is more or less in line with their share of all professions and the population. Below is the table that indicates the gender and racial impact on IT skills in South Africa

Table 2.3.2.1: South African IT Professionals according to gender and race

Category	IT Professionals	IT Managers	All Professionals	All Professionals excl. nurses and school teachers	Population
<b>Gender</b>					
Male	<b>67.50</b>	82.76	52.05	69.97	49.4
Female	<b>32.50</b>	17.24	47.95	30.03	50.6
<b>Race</b>					
Asian	<b>7.42</b>	3.94	4.21	3.87	2.55
Black	<b>3.35</b>	0.61	33.36	14.61	76.28
Coloured	<b>6.23</b>	5.07	9.61	5.58	8.51
White	<b>83.01</b>	90.38	52.81	75.93	12.67

SALRU Living Standards and Development Survey, 2000: [Online]).

The White Paper on e-Education (DoE, 2003: [Online]) estimated that more than a quarter of South Africa's 25 750 schools had computers for teaching and learning in 2002 (DoE, 2003: [Online]) but although they may have had access, it is not known whether the computers were actively used for teaching and learning. Strides have been taken to provide computer support, but lack of training and a computer 'culture' limit the utility of the equipment. For instance, the Department of Trade and Industries has 800 PCs linked together, but only thirty users actively use the available electronic mail facilities (DoE, 2003: [Online])

Figures (see Chart 2.2) reveal that while about 57 percent of schools in the Western Cape province have schools with computers for teaching and learning, only 4.5 percent of schools in the Eastern Cape do (Zehr, 2004: [Online]). This limited accessibility to computers may also contribute to the imbalance in the acquisition and development of ICT skills.

Addressing this imbalance requires addressing the basic educational imbalance in South Africa. However, IT is probably in a better position than other professions to address this imbalance as participation in the labour market does not necessarily depend on have a computer-related degree. Persons with some tertiary education (and sometimes with no tertiary education) can register for and complete short IT qualification courses (such as a three-month programmers course) to gain initial access to the profession. They should also not be at a severe disadvantage as much of the IT knowledge is generated through informal and on-the-job methods rather than formal training, and the IT professional services tend to spend a greater proportion of turnover on in-house and external training. Therefore, addressing the imbalance should also involve access to short IT courses in addition to the full tertiary IT qualifications and improving access to IT employment (DoE, 2003: [Online]).

Over past years, the South African government, the private sector and non-governmental organizations have responded positively to the challenge of bridging the gap. Below are some of the efforts for training teachers in ICT skills.

### **2.3.2 Teacher training programmes for ICT development**

The Department of Education in South Africa has joined hands with the public and private sector in training its people to acquire computer skills by developing projects helping an attempt to combat computer illiteracy.

### 2.3.2.1 Universities

Most South African higher education institutions offer computer courses and in the faculties of education, teachers are also trained in ICT. For an example, the University of Johannesburg upgrades teachers by training them in educational computing. The purpose of the educational computing course is to enable teachers to enrich/supplement their existing knowledge and competence in educational computing. The modules for educational computing include Educational Computing (Fundamental), Computers for educators (Core), Computer-Integrated Education (Core) and Educational Multimedia Development (Core).

The University of Western Cape in collaboration with NetTel@ Africa, has created a unique on-line learning program. NetTel is an African Network created for capacity building and knowledge exchange in ICT (information and telecommunications technology) policy, regulation and applications. The University of Western Cape is one of the networks that addresses the shortage of African telecommunications professionals, one of them being teaching. The university uses a Knowledge-Based Environment for Web-based Learning (KEWL) platform for facilitating course development and completion. Teachers study as part-time students, without disrupting their teaching profession.

### 2.3.2.2 World Bank

The World Bank is the largest international donor in the field of ICT for development and has ICT projects in over 80 countries. The World Bank has helped the developing countries over the past 25 years with ICT access. The World Bank provides a global overview of ICT trends and policies in developing countries, covers issues such as financing infrastructure, and monitors the importance of public-private partnerships and effective competition to extending access, using ICT in doing business and formulating national e-strategies.

### 2.3.2.3 Intel Teach to the future

This project aims to improve ICT integration in the classroom. This professional development programme was designed to address the challenges teachers face in effectively applying computers and the Internet to enhance learning. The facilitator-led training incorporates the use of the Internet, Web page design and multimedia software.

The main goal of Intel Teach to the Future's programme is to reach 500 000 teachers and millions of learners, worldwide by the year 2003. However, in South Africa about 40 000 teachers have been trained to be empowered to teach in innovative and relevant ways. The programme trains classroom teachers on how to promote project based learning and effectively integrate the use of computers into the curriculum in line with the Revised National Curriculum Statements (DoE, 2002) so that learners will increase their leaning and achievements. The training consists of 40 hours to be delivered via 10 curricular modules.

The themes of Intel Teach to the Future are to develop the effective use of technology in the classroom; to focus on the ways learners and teachers can use technology to enhance learning through research, communication, and productivity strategies and tools; emphasise a hands-on learning and the creation of curricular units and assessment tools, which address the outcomes of Curriculum 2005 and Revised National Curriculum Statement; to promote engaging opportunities for learners through access to technology; and to encourage educators to work in groups, solve problems and participate in peer review of their units (Candau, Doherty, Yost & Kuni, 2004).

#### 2.3.2.4 Gauteng Online

Gauteng Online is one of the projects launched on the 14<sup>th</sup> June 2001 by Mbhazima Shilowa, the Gauteng Premier, with the aim of combating computer illiteracy. The intention of the project is to provide every learner and teacher in public school with access not only to computers, but also with free access to Internet, free e-mail and academic curriculum delivery. The project started with 25 schools and one educator per school, and the process will be going until 2006(Gauteng Online, 2002: [Online]). The

project forms the foundation for an informed and computer literate society, enhancing job creation and progressing Black empowerment.

#### 2.3.2.5 Microsoft teacher training programme

Mangena, the Deputy Minister of Education, launched the Microsoft Teacher training programme on the 2<sup>nd</sup> July 2003. Microsoft donated software to 28 000 public schools in the Department of Education. Microsoft has taken their sponsorship further by establishing the national Master Facilitator teacher-training programme. The programme is aimed at training educators in basic computer literacy, an almost non-existent skill, especially among the educators in disadvantaged areas (DoE, 2003: [Online]).

#### 2.3.2.6 SchoolNet

SchoolNet South Africa was established in 1997 in the historically disadvantaged schools. SchoolNet in partnership with the Department of Education National Centre for Technology conducts educator development courses introducing ICT skills into the curriculum and management. SchoolNet uses a distance education mode of learning with mentor-based assistance.

The flexible, distance learning model entails a one day face-to-face workshop, a CD resource with course material and optional online links, communication with mentors via email and communicating with groups of participants via mailing lists and chat forums.

The most fascinating aspect of this flexible, distance programme, which enables teachers to develop their ICT skills, is a combination of traditional IT skills and information literacy skills. Even the one day, face-to-face training in basic computer literacy, is quite different to the usual formal training of years ago (Zinn, 2000 [Online])



### 2.3.2.7. The Khanya technology in education project

The aim of this project is to deliver curriculum and to establish a more efficient administrative communication system within the Western Cape Education Department (WCED) using ICT and Audio-Visual Technology (AVT). The project can be considered unique in the world because it attempts an approach to curriculum delivery in a context of overwhelming economic and social disadvantage. Although Khanya is a Western Cape initiative, the National Centre for Technology and Distance Education has been very supportive and has acknowledged it as a national pilot project the first of its kind in South Africa (Zinn, 2000: [Online]).

The provincial Minister of Education for the Western Cape, Helen Zille, is passionate about this project and sees it as a means to closing the gap between historically advantaged schools and disadvantaged schools. The project endeavours to give all learners and teachers access to appropriate ICT-based and AVT-based learning and teaching resources in all learning areas. Besides enabling learners and teachers to become ICT/AVT literate, proficiency in information literacy skills are accepted as crucial for the advancement of lifelong learning.

The mechanism being used to implement educational technology to support the learning and teaching process is the integration of nine elements within a chain of value. Each element in this value chain is an important aspect on its own which when linked together binds all the essential components for the effective use of technology in education to be developed.

The elements of the value chain are understanding investment in technology; training educators to use ICT/AVT to support and enhance learning and teaching; getting schools ready to accept ICT/AVT; procurement and installation of technology; development and management of appropriate content; curriculum integration; ongoing technical support; and ongoing curriculum support continuous research and evaluation (Zinn, 2000: [Online]).

#### 2.3.2.8 The ISPA Social Development Project “Train the Teachers”

The Internet Service Provider Association (ISPA) agreed to initiate a programme to assist in solving the computer literacy problems experienced in schools in 2001. It was agreed that teachers from the Johannesburg East District 9, one of 12 districts with the Gauteng Department of Education would be given the opportunity to attend a basic PC Literacy training course. The ISPA Management Committee approved the Social Development Pilot Project “Train the Teachers”. The task team commenced with formulating the criteria for the implementation of a “Beginner's Course”. SANGONeT's training facility was selected as the venue. The course content was developed and finalised with the assistance of the SANGONeT Training Co-ordinator. The first course took place during November/December 2001 over a period of 5 Saturdays. The trainers reported that the course had been very successful and that teachers had shown enthusiasm and eagerness to learn and were grateful for the opportunity to enhance their skills.

An ISPA Social Development Committee was formed and UniForum SA approached with a request to give consideration to sponsoring this training. UniForum kindly agreed to contribute an approximate amount of R20, 000.00 per month. An ISPA / UniForum partnership was formed accordingly.

Proposals submitted by the trainers were considered and members of the SocDev Committee agreed that the first group of 20 teachers who had completed the “Beginners Course” would be given an opportunity to attend Excel and Internet Courses, (not covered in the first course). The bridging course took place from 25 May to 15 June 2002. A second "Beginners Course" was run from 24 to 28 June 2002. During 2002, a total of 40 teachers were trained (ISPA, 2005: [Online])

#### 2.3.2.9 IRIN (Integrated Regional Information Networks)

The IRIN, a project of the UN Office for the Coordination of Humanitarian Affairs, was launched in 19 May 2003 in the Limpopo Province. This project has donated computers while Microsoft donated software to 11 deep rural schools in the Tzaneen area of Limpopo. Three schools were already connected to Internet through the donation of

public phone shop by MTN. The aim is for all schools to be connected to the Internet over time. Computers are used for teaching basic computer skills for teachers and learners. The project has also rolled out to Mpumalanga and Kwazulu-Natal Provinces (IRIN, 2005: [Online])

#### 2.3.2.10 The Department of Education

The Digital Partnership in South Africa was formed in June 2002 as a public-private partnership representing the South African Government. The Digital Partnership is an international partnership facilitating innovation and affordable access to technology, training and the Internet for learning, enterprise and development in developing and emerging market economies through a sustainable private/public partnership model. The Department of Education in collaboration with Digital Partnership, has established e-learning centres and resource and learning centres. The Digital Partnership has strived to establish e-learning centres at a local level in schools and social enterprise settings in disadvantaged communities of South Africa. Some of the former teachers' colleges are used as learning centres. Each e-learning centre is equipped with at least 30 re-built PCs with Internet connectivity through a networked environment. E-learning centres offer a number of training programmes, from basic IT skills to network administrator training.

Further training programmes are delivered at a regional scale at resource and learning centres. The resource and learning centres offer training support from companies such as Microsoft, Intel and Cisco Systems. Supported by the Vodafone Foundation, the resource and learning centres represent a national initiative that provides the focus for training of principals, teachers, network administrators, trouble-shooters and project managers engaged in the digital partnership throughout South Africa. Currently, there are eight regional digital partnership resource and learning centres in Community Centres of Limpopo, Mpumalanga, Western Cape, North West Province, Free State, KwaZulu Natal, Eastern Cape and Northern Cape (SALRU Living Standards and Development Survey, 2000: [Online]).

Resource and learning centres offer the following benefits:

- Enhanced specialised equipment to enable teachers and educators to learn ITC skills and about advanced technology.
- Support for teachers to attend the training at resources centres for six weeks a year.
- Industry-approved education programmes for teachers, principals, ICT assistants, network administrators and parent orientation to ICT.
- Specialised and dedicated staff to deliver and co-ordinate training (The Digital Partnership, 2004: [Online])

#### 2.3.2.11 Multi-purpose Community Learning Centres (MPCLC's)

Multi-purpose Community Learning Centres are centres that can “enable communities to manage their own development through having access to appropriate facilities, resources, training and services”(DoE, 1995: [Online]).

Many of these centres are reliant on donor funding and/or education departments for their financial sustainability. Many previously had staff that worked on a part-time basis and were paid part-time rates by the ex-departments of education. They provide computer and ICT skills training, and provide study centres and resource facilities for Technikons, technical colleges, correspondence schools and universities (Hodge & Miller, 1997: [Online]). They are also quite active with the in-service development of educators.

However, the new technologies of ICTs and computer-aided instruction are certainly going to have an influence on instructional approaches. They are able to assist in self-learning in the classroom and at a distance; help overcome the lack of sufficiently skilled teachers and serve as a teaching tool for students and teachers; be used to upgrade teacher skills; exchange experiences and teaching material; and in addition, ICTs and networks can also be used to create repositories of study material that can be transmitted and reproduced (Hodge & Miller, 1997: [Online])

The Department of Education trains teachers so that they can transfer the computer skills back to their work places. However, Isaacs argues that the training programmes are shortlived or unsustainable, since there usually is no move beyond the programme after completion (Zehr, 2006: [Online]). This section has outlined how computer training programmes have provided support, and how DoEs have acted, the next section will explore the issues around the transfer of learning.

The next section will explore the issues around the transfer of learning.

## **2.4 THE COMPLEXITY OF TRANSFER**

Transfer is a complex phenomenon that involves many factors. To clarify the complexity of the phenomenon, the concept transfer, transfer of skills, learning, and computer skills will be explained in detail.



### **2.4.1 What is transfer?**

Farlex (2005: [Online]) defines transfer as to “convey or cause to pass from one place, person, or thing to another” ([Online]). Farlex further defines transfer as “application of a skill learned in one situation to a different but similar situation” (Free Dictionary 2005: [Online]). Ellis, Single and Anderson (cited by Beard) agree with Farlex’s definition, and furthermore define transfer “as the application of knowledge and skills acquired in one setting to other situations” (Beard 1993: [Online]).

Similarly, Haskell defines transfer as the way in which previous learning influences current and the future learning, and how past or current learning is applied or adapted to similar or novel situations (Haskell, 2001:23). Haskell further defines transfer as “the carrying over of meaning from one situation to another” (2001:26). Furthermore, transfer is the “effect of previous learning on new learning or problem solving” (Mayer, 2002: 4). Contrastingly, transfer is defined as a process of learning in specific domains rather than

a direct application of what has already been learned, with teachers explaining that they hope that their students transfer what they learn from one class to another and to the outside world (Schwartz Vol.4:1449).

The assumption that teachers have on learners is further opposed by Brown, Greeno and Resnick (Schwartz, Vol.4:379), who define transfer as “how learning and performance in one setting prepares one to learn the rules, habits, and knowledge appropriate to a new setting, not how knowledge or skill is transported “whole’ from one setting to another.” However, Nisbett, Salomon and Perkins (cited by Schwartz: 380), claim that research on transfer has produced disappointing result. They further claim that there has not been much evidence that what is learned in one setting is spontaneously or easily applied in another setting (Vol 4 379, cited by Schwartz). Nisbett et al (1987: 5) further argue that transfer is a “process of learning in specific domains rather than as direct application of what is has already been learned”. Transfer is the application of knowledge and skills acquired in one setting to other situations (Ellis, 1978, Singley & Anderson 1989:2). Three transfer possibilities exist (Ellis, 1978; Hall, 1971; Wexley & Latham, 1981:3):

The direction of transfer may be positive, negative or nonexistent. Positive transfer occurs when learning results in better performance in subsequent task. Similarly, Mayer (2002: 5) contends that, “positive transfer occurs when previous learning helps new problem solving or learning.” Beard cites Tanaka and confirms that “research supports the proposition that positive transfer is enhanced by the similarity and consistency from one learned task to another” (Beard, 1993: [Online]).

Negative transfer occurs when poorer performance in a new situation is caused by previous learning. Furthermore, Mayer (2002:5) contends that negative transfer, “occurs when previous learning hurts new problem solving or learning”. Transfer is nonexistent when previous learning has no measurable effect on subsequent performance of a related task. Mayer (2002:5) calls nonexistent transfer, neutral transfer which “occurs when previous learning has no effect on new problem solving or learning”.

However, transfer is acknowledged as a complex phenomenon that entails many factors (Beard, 1993: [Online]). The complexity of transfer is experienced by Singley and Anderson (cited by Beard) who do not know exactly “whether the substantive issue in transfer research is whether transfer is specific or limited to scope or whether it is broad and ranges across diverse tasks and disciplines” [Online]. Thus, one can assume that transfer can be viewed as a unitary phenomenon dependent on learning from one context to another based on some conditions (Beard, 1993 [Online]). It is for the same reason that Thorndike (cited by Beard) contends that transfer is specific and is a function of the degree of identical stimulus response that is present in the original and subsequent learning events (Beard, 1993: [Online]). Therefore researchers conclude that both concrete and abstract knowledge, skills and learning, can be transferred under certain conditions. However, it is argued that people learn differently.

#### **2.4.2 Authentic learning and transfer**

Learning is change in someone’s knowledge based on the person’s experience, which can either be permanent, be reflected in behavioural change or be experienced based (Mayer, 2002: 3). It has been indicated that people learn differently, that constructively where “each of us can only learn by making sense of what happens to us through actively constructing a world for ourselves” (Nick 1999:3). However Nick (1999: 21) further claims that people cannot construct meaning, but indicates that, “for the most part, individuals learn, not construct meanings” (1999:21). Secondly, people learn cognitively, wherein learning takes place when new knowledge is modified to be assimilated, or schemas may be modified to accommodate the new knowledge or both may occur (Alessi & Trollip 2001:34). Alessi and Trollip (2001:34) further indicate that cognitivism promotes active learning. A learner, who is actively involved in learning, creates and stores new knowledge and skills. Storage of knowledge and skills does not guarantee transfer of those skills and knowledge. Thirdly, people learn behaviouristically wherein changes in the observable behaviour of a learner are made as a function of events in the environment (Alessi & Trollip 2001:16).

It is assumed that ideas that people learn are part of the larger context which Johnson (2002:3) refers to as “the pattern of relationships in one’s own environment”, hence people must determine the aspect of context which is relevant (Schwartz, Vol.4: 1450). Schwartz, (Vol. 4: 1451) further contends that people learn by encoding the context in which target idea occur, even if that context is incidental. Alessi and Trollip (2001: 33) further argue that learning that is contextualized, always affects learning and is known as authentic or situated learning. In comparison, Collins (cited by Herrington and Oliver, 2000: [Online]) further contends that authentic learning is “the notion of learning knowledge and skills in contexts that reflect the way the knowledge will be useful in real life”.

Allessi and Trollip (2001: 33) furthermore contend in authentic learning that skills learned in a particular context are easily repeated by learners as long as they are in that context, but are inaccessible outside of that context, hence, such inaccessible knowledge is referred as inert knowledge (Whitehead cited by Herrington & Oliver, 2000 [Online]). However, Allessi and Trollip argue that properly designed authentic learning environments enhance transfer to other settings. Similarly, Koschmann (1994: 237) contends that the context in which learning occurs, affects learner’s ability to retrieve and apply knowledge subsequently. Bransford, Vye, Kintzer and Risko (cited by Koschmann) suggest that knowledge acquisition should be intertwined with knowledge applications (2002:236). Furthermore, Johnson (2002:3) contends that meaning emerges from the relationship between content and context, which enables learners to connect content to real life situations, which thus lead to application of content in different settings hence, transfer of learning takes place.

Transfer has been defined as application of knowledge and skills from setting to another (see paragraph 2.4.1). Transfer of learning can be explained as “the ability to use learning gained in one situation to help one another” (Schwartz Vol. 4:1447). Similarly, some of the authors regard the concepts transfer of learning and transfer training as having the



same meaning. Transfer of training and transfer of learning are defined first to further clarify the concept “transfer”.

Transfer of training is effective and continuing application of skills, knowledge, and/or attitudes that were learned in a learning environment to the job environment (Clark, 2000: [Online]). Transfer of training is the magical link between the classroom performance and the real performance that one is expected to do in real life illustrating that transfer of learning takes place when one can think, plan, reason and make good decisions (Haskell, 2001:xiv). Similarly, Phillips and Broad (1997:2) defines transfer of learning as the “effective and continuing application by learners to their performance of jobs or other individual, organizational, or community responsibilities of knowledge and skills gained in learning activities”.

Haskell sees the transfer of learning as the “the use of past learning when learning something new and the application of that learning to both similar and new situations” (Haskell, 2001: xiii). Even though transfer of learning is the influence of prior learning on performance in a new situation, if some of the skills and knowledge are not transferred from prior learning, then each new learning situation would start from scratch (Clark, 2000: [Online]). By comparison, Alessi and Trollip define transfer of learning as the extent to which performance in one situation is reflected in another situation (2001:29). Alessi and Trollip further define transfer of learning as an application of what is learned in an instructional environment to the real world activities, such as being able to fly an aircraft after having used as flight simulator programme (2001:29).

Alessi and Trollip also differentiate the two types of transfer, namely: near transfer and far/distant transfer. In comparison, Charles agrees with Alessi and Trollip’s types of transfer, namely near transfer and far transfer (2001: 30). Charles affirms this by highlighting dimensions of transfer, namely far, near or distant and general or specific transfer. Near transfer is applying the learned information or skills in a new environment that is very like the original one (Allessi & Trollip, 2001:30). For the purpose of this study, learning in context is considered as an important in the transfer of learning to

practice setting. Similarly, Clark defines near transfer as application of skills and knowledge that are applied the same way every time the skills and knowledge are used (Clark, 2000: [Online]). Beard defines near transfer as “the transfer of learning to a new problem-solving domain that has features similar to those in which proficiency was established”(Beard, Vol.25 Issue 4:3: [Online]) Moreover, Clark argues that near transfer training usually involves tasks that are procedural in nature, that is, tasks which are always applied in the same order. On the other hand, Charles defines near transfer as the transfer of learning to new problem solving domain that has features similar to those in which proficiency was established. Near transfer can be enhanced by Gagne’s theory of identical elements by having the elements of instructional environment (both stimuli and responses) very similar to those of the application environment. Near transfer is defined by Broad and Newstrom as “the extent to which individuals apply what was acquired in training to situations very similar to those in which they were trained” (1997:52). Researchers argue that the success of near transfer depends heavily on the identical elements approach, in which the training experience closely approximates the task demands of the job itself. Beard furthermore contends that near transfer can be achieved “when trainers teach end-users to utilize particular software packages than teaching them sweeping introductions to computers” (Beard, 1993 [Online])

However, Beard indicates that much of the research on computer skills and transfer has failed to identify the kind of transfer that was under investigation (Beard, 1993 [Online]). Researchers emphasized the importance of recognizing that transfer of computer skills as a polymorphic event that can occur in one or more of the dimensions of the specific/general and near/distant continuums (Beard, 1993 [Online]).

Contrastingly, far transfer is the ability to use learned knowledge or skills in very different environments. In addition, far transfer can be defined as the “extent to which the trainees apply the training to novel or different situations from the ones in which they were trained” (Phillips & Broad, 1997: 52). Far transfer can be enhanced by building variation into the instructional environment so as to facilitate generalizing to other stimuli and responses (Machin & Forgaty, 2003:30). Far transfer also known as distant transfer is

further defined by Charles as the transfer of learning to a distinctly different domain. Far transfer tasks involve skills and knowledge being applied in situations that change. Far transfer tasks require instruction where learners are trained to adapt guidelines to changing situations or environments (Clark, 2000: [Online]). However researchers, argue that the success of far transfer depends on the presence of general principles that trainees acquire and apply to new and novel problems (Phillips & Broad, 1997: 52). Specific transfer involves the transfer of discrete skills or concepts. However, research has proven that transfer of learning is limited to near transfer, but evidence for far transfer is generally lacking (Haskell, 2001:13).

Haskell identified six levels of transfer instead of two types of transfer:

**Level 1:** Nonspecific transfer: Connections that one makes between the new and the past experience.

**Level 2:** Application transfer: Applying what one has learned to a specific situation.

**Level 3:** Context transfer: Applying what one has learned to slightly different situation.

**Level 4:** Near transfer: “Previous knowledge is to new situations that are closely similar but not identical to the previous situations.”

**Level 5:** Far transfer: “Applying learning to situations that are quite dissimilar to the learning experience.”

**Level 6:** Displacement or creative transfer: “Transfer of learning in a way that leads to more than insight what was learnt” (2001:30)

Researchers claim that low levels of transfer are common in the absence of conscious collaborative efforts by major stakeholders. Below are some of the estimations assumed by researchers (Phillips & Broad,1997:2) on transfer:

- Human Resource Development (1986) estimates that only 15% of training is still being applied by learners one year after training.

- Baldwin and Ford (1988) found that American industries spend up to 100 billion dollars on training per year, but that not more than 10% of the expenditure result in transfer of new skills and knowledge to the job.
- Brinkerhoff and Gill (1994) found that “the impact of training practices is shockingly small”, with close to 80% of the efforts of most Departments wasted.
- Brinkerhoff and Montesino (1995) refer to studies that indicate that no more 20% of the investment in training pays off in transfer to the job.
- Tannelbaum and Yuk(1992) found that transfer of learning generally was low, with as 5% of learners indicating that they had applied their learning on the job

The low levels of transfer is further confirmed by Haskell, by contending that research findings over the nine past decades show that individuals and institutions have failed to achieve transfer of learning on any significant level (Haskell,2001:xiii). Researchers claim that lot of money was spent on employee training, but little evidence links training with improved job behaviour (Haskell, 2001:5).

Beard (quotes Baldwin and Ford, 1993 [Online]) who confirms the low levels of transfer and pointed out that less than 10% of the money spent on all kinds of training result in positive transfer to the actual job. Gibbons agrees with Baldwin and Ford and argues that many types of training result in the waste of money and time (Beard, 1993 [Online]). Piedmont estimates that three fourths of the money that companies spend in training their employees in computer related skills are wasted (Beard, 1993 [Online]) illustrating that computer students fail to apply their education to solve real-world problems with technology (Beard, 1993: [Online]).

Similarly, research on computer skills has demonstrated that “transfer may be both specific and general in nature” (Beard, 1993: [Online]). However, studies reveal that when one misses one component during interaction with computer, then computer skills learnt in one situation may fail to transfer to a subsequent task (Beard, 1993: [Online]) Missing one component during interaction with a computer can be caused by sheer complexity knowledge required to use a computer system. The knowledge involves

knowledge extracted from the wider environment, knowledge related to the problem motivating the exchange, knowledge transferred from experience with other machines and procedures, and specific knowledge demanded by the current system (Beard, 1993: [Online])

Contrastingly, research points out that when a new user learns about a computer system, he/she builds conceptual models. The models relate to what they already know. Therefore, “if users can easily build consistent models of the computer, they will perceive the system as easy as they learn, but if they build complex models, they will perceive the system as difficult and confusing” (Beard, 1993 [Online]). Consistent models promote near or far transfer. Of equal importance, computer skills that are applicable across technological platforms are more transferable than highly specific skills that may soon become obsolete (Beard, 1993 [Online]).

To facilitate the transfer of computer skills, Beard (1993 [Online]) recommends that introductory computer courses should have more realistic goals with regard to the provincial nature of education that they provide; computer educators should adopt modern computer interfaces that demonstrate high degree of consistency; a problem solving model of education might encourage transfer to other cognitive skills; computer educators should attempt to understand and articulate the underlying framework of software and powerful models and metaphors of computer operations; and new naturalistic research that examines the transfer of computer skills from one software package to another should be conducted.

Researchers argue that there is a significant gap between learning and the transfer of learning. They will have to assess the value of learning activities in the workplace situation over time, not by size of investment, the number of learners, or even the levels of competence in the learning events. Hence, the assessment of transfer of learning to the workplace can be assessed by use of Kirkpatrick’s four levels of evaluation:

Table 2.4.3.1: Kirkpatrick's (cited by Phillips & Broad, 1997: 5) four levels of evaluation

<b>Level of Evaluation</b>	<b>Information provided</b>
<b>1. Reaction</b>	Learners' likes, dislikes about program -Quality of instruction -Usefulness of content -Methods and media used Learner intentions to apply learning Learner suggestions for improvement of program
<b>2. Learning</b>	Extent to which learners achieved desired knowledge/skill Extent of attitude changes during learning activity
<b>3. Behaviour</b>	Extent to which learners transfer new skills to the job
<b>4. Results</b>	Impact on organizational operations or job environment -Reduced costs -Improved quality -Higher productivity -Greater customer satisfaction -Other measures

It can be assumed that the four levels provide necessary information needed about transfer of learning in the workplace.

### **2.4.3 Factors that influence transfer of learning / training**

Phillips and Broad (1997:25) identify factors that influence transfer of learning to the workplace such as management actions and barriers to transfer. Management actions support transfer but research has confirmed that there is lack of demonstrated support by managers in many organizations. Beard agrees with Phillips and maintains that “well

learned skills may not be maintained due to the lack of supervisory support” (Beard, Vol.25 Issue 4:4: [Online]). On the other hand, Machin and Fogarty (2005: [Online] argue that transfer of learning is influenced by post-training self-efficacy, transfer enhancing activities and trainees’ level of learning during training.

Phillips and Broad (1997:9) has identified barriers to transfer and ranked the nine categories from highest to lowest.

Table 2.4.3.2 Trainers’ perceptions of barriers to transfer of training

<b>Rank: Highest to Lowest</b>	<b>Organisational Barrier</b>
1	Lack of reinforcement on the job
2	Interference in the work environment
3	Non-supportive organizational structure
4	Trainees view the training as impractical
5	Trainees view the training as irrelevant
6	Trainees discomfort with change
7	Trainees separation from trainer after training
8	Poor training design and /delivery
9	Peer pressure against change

(ASTD 1997:9)

Kotter (cited by Phillips & Broad in ASTD, 1997:10) surveyed a variety of organizations, and identified four factors that inhibit efforts to transfer training to the workplace include:

- Lack of top management involvement in the training and development
- Impetus for change only from top executive levels, with little buy-in by lower level managers.
- Staff-centred behavioural change efforts, with little management involvement
- Unrealistic, unreachable change goals for training and development.

The common thread in the four factors is the lack of collaborative efforts among the stakeholders in behavioural change. However, Phillips and Broad (1997:11) have identified characteristics of trainees and work environments that support transfer of training. Trainees' abilities, aptitude, personality (need for success and internal locus of control) and motivation support transfer of training. But, in order for transfer to occur, trainees need a supportive work environment with preliminary discussions with their supervisors, who can assist in creating opportunities to use new learning and give feedback following training.

Phillips and Broad (1997: 12) agree with ASTD by indicating that external factors may also present problems that affect transfer of new skills, hence re-organisation may be distracting in such a way that employees fall back on old habits without trying new behaviours. However, "the organizational culture may discourage risk taking behavior, trainees may be reluctant to try newly learned skills because they fear negative consequences for failure" (Phillips & Broad 1997: 143). Despite the afore-mentioned factors that may inhibit transfer of skills to the workplace, some experts suggest that "trainees may be likely to transfer skills to their job if they have the abilities and aptitudes for the new skills, personality traits such as high achievement needs and internal locus of control and motivation to use new skills on the job" (Phillips & Broad 1997: 143).

Beard (1993: [Online]) classifies these factors as input factors and output factors and indicated that they have a direct and an indirect effect on the conditions of transfer. Beard further indicated learning and retention to be directly affected by instructional design, student characteristics and the work environment, whereas, student characteristics and work environment factors impact transfer. Notably, student characteristics and the work environment directly influence the quality of learning and retention and thus mediate transfer effect. At the same time, these factors operate directly on the conditions of transfer.

In conclusion, no single factor can be considered being capable of positively affecting transfer in isolation, but all factors play role in positively affecting transfer.



### **2.4.5 Conditions of transfer**

Transfer of learning depends on certain conditions. Luria cited by Beard (1993 [Online]) contends that transfer may depend on literacy and education. However, in contrast to Luria's point, Scribner and Cole (quoted by Beard, 1993 [Online]) suggest that transfer may depend on extensive practice of the performance in question in a variety of contexts. Secondly, Gick and Holyoak (cited by Beard, 1993: [Online]) indicate that transfer also depends on whether learners have abstracted critical attributes of a situation. To illustrate Gick and Holyoak's point, studies have been conducted where problems that needed basic principles were presented, and results suggested "explicit abstractions from a situation foster transfer" (Lawton & Gordon, 1996: 74). Thirdly, studies have further indicated that meta-cognitive reflection on one's processes appears to promote transfer of skills (Luria, cited by Beard 1993: [Online]). Meta-cognitive reflection contrasts with the second condition of transfer namely explicit abstraction in that abstraction focuses on the structure of the situation whereas self-monitoring focuses on the structure on one's own thinking process. Simultaneously, "transfer of learning also depends on previously learned material that serves a metaphor" (Lawton & Gordon, 1996: 74). For instance, learners living far from the ocean may understand the idea of ocean as a big river.

However, researchers, claim that trainers of any skill, such as computer skills, have to be proactive enough in addressing all factors that influence the transfer process (Phillips & Broad, 1997:15). Equally important, full transfer of learning to the workplace requires pulling together all stakeholders who have an impact on the organisation's training activities. In fact, managers, trainers and trainees must work together to address the transfer problems in organisations. The trainees have to recognize the need for new skills. As a result of the complex knowledge and skills that employees need to function effectively, they must be ready to take full responsibility of new knowledge and skills. Trainers, therefore, must design and deliver learning experiences and the managers must support learning and application of skills on the job. Supervisory support and motivation are necessary to promote transfer hence all factors need to be taken into account.

Anthony and Gerard (cited by Phillips & Broad, 1997:19) claim that the first empirical test of conceptual model of training transfer sought to explain how trainees' perceptions of various in-training transfer enhancing activities such as over-learning, fidelity, stimulus variability, principles meaningfulness, self-management activities, relapse prevention and goal-setting would predict the self efficacy and implementation intentions (rather than actual transfer outcomes) of computer skills trainees. They further argue that post-training self-efficacy and transfer enhancing activities both predicted implementation intentions. They also indicated that pre-training self-efficacy also significantly predicted post-training self-efficacy, trainees level of learning during training and transfer enhancing activities, providing support for the conceptual model of training (2005: [Online])

Researchers argue that training achievement is significantly related to transfer behavior. Trainees perceive that supervision is matching. However, Thorndike (2000: [Online]), cited by Clark, argues that "previous learning facilitates new learning only to the extent that the new learning task contains elements identical to those in the previous task" (2000: [Online]). Therefore, to produce positive transfer of learning, there is a need to practice under a variety of conditions. Researchers argue that many variations should be provided in the learning environment for transfer of learning to take place. Importantly, trainers have to encourage transfer of learning in the classroom, then it will be possible to transfer learning successfully outside the classroom. However, Schwartz (Vol.4: 1449) contends that transfer of learning depends on knowing the context in which the a particular skill is useful. Contrastingly, researchers claim that learning in context might be a problem for transfer, since transfer occurs when the original context is not reinstated (Schwartz, Vol4:1451). Resnick cited by Herrington and Oliver (2000 [Online]) furthermore argue that transfer of learning depends on the way which the design of the 'bridging apprenticeships' in order to bridge the gap between the theoretical learning in the formal instruction of the classroom and the real-life application of the knowledge in the work environment."

Haskell (1998: x) identifies factors to be borne in mind by trainers as conditions that can enhance transfer of learning:

- Acquisition of primary knowledge in which transfer is required.
- Seeking level of knowledge base in subjects outside primary area
- Obtaining an understanding of the history of in the area that one want to transfer
- Acquiring motivation or spirit of motivation
- Understanding meaning of transfer and how it works
- Striving towards an orientation to think and encode learning in transfer of learning terms
- Creating cultures of transfer or support systems
- Understanding the theory underlying the area you want to transfer
- Engage in hours of practice and drill
- Allowing time for the learning to incubate

## **2.5 SUMMARY**



The chapter provided an extensive literature review on the definition of skills which provided the basis for computer skills. The chapter further provided review on transfer of skills and learning back to the workplace. The concept transfer of learning was explained, which form the basis for the analysis and interpretation of results. The factors and conditions of transfer also created a background for the analysis and interpretation of results later. The literature review has progressed from determining what research has already been done on the research question. Of equally importance, the literature review has already answered some of the questions that I as a researcher want to investigate.

## **CHAPTER 3**

### **RESEARCH DESIGN OF THE STUDY**

#### **3.1 INTRODUCTION**

This chapter describes the research design that was used to collect, record and interpret data used in this study. Research is described as a systematic process of collecting, analyzing and interpreting data in order to increase people's understanding of the phenomenon about which they are interested (Leedy & Ormrod, 2005: 4). In this chapter, the research design of the study is explicated. Creswell describes a qualitative research approach as "an approach in which the enquirer often makes knowledge claims based primarily on constructivist perspectives (2002: 18). This study is typified as a case study. According to Leedy and Ormrod (2001:149), "a case study is a study in which a particular individual, program, or event is studied in depth for a defined period of time to it in great depth". In addition, Henning, van Rensburg and Smit, define case study as "an in depth study of natural situation, many angles, focuses on group or individual" (2004:49).

In this study, similar techniques were used to develop and validate a case that investigated the transfer of learning by teachers between the former teacher's college, now called EMPC and teaching practice. As previously indicated, teachers attend a computer skills course at the teacher's college, but little is known about the transfer of the computer skills back to their work environments. The literature review conducted indicates that there are factors that influence the transfer of computer skills by teachers in their teaching practice. The factors may affect the transfer of these computer skills positively or negatively.

In this chapter, the role of literature review is considered and then followed by a description of the research design, the research strategy, data collection techniques, data analysis and the reliability and validity of the study.

### **3.2 THE ROLE OF THE LITERATURE REVIEW**

In the literature review, I have described the related research that supports my study and which serves as a contributor to shape my frame of reference (White, 2003:26). De Vos (cited by White) explains the literature review as a contributor for clearer understanding of the nature and meaning of the identified problem and as such three roles of literature review become apparent:

- It may disclose that somebody has already performed the same research.
- It provides better insight into dimensions and complexity of the problem
- It equips the researcher with complete and thorough justification for the subsequent steps in realizing the importance of the research (White, 2003: 26).

Creswell shares similar views on the role of literature review. Creswell outlined the following roles:

- It shares with the reader the results of other studies that are closely related to the study being reported.
- It relates a study to the larger ongoing dialogue in the literature about the topic, by filling the gaps and extending prior studies.
- It provides a framework for establishing the importance of the study as well as a benchmark for comparing the results of a study with other findings (2002:30).

The theoretical framework underpinning the investigation of this study is the transfer of learning by teachers between the EMPC and their teaching environments. In addition, the literature review has set the context of the participants in this study, whose extent of the transfer of learning is being investigated. Moreover, to fully understand the concept “transfer of learning”, a literature review on this topic has been undertaken with the concept “transfer” being fully explained from different perspectives.

The factors that influence transfer of learning and conditions of transfer were identified as the appropriate yardstick for understanding transfer of learning for the participants in this study. For the same reason, studies that have been undertaken worldwide so far, have identified the reinforcement, support, trainees' views, trainees' confidence and design of learning programme involvement of all stakeholders in the workplace. These stakeholders which include the managers, trainers and trainees could be considered a factor that influences transfer of learning. The importance of this study rests on the premise that the participants' abilities to transfer computer skills to their work environments, is influenced by some of the factors and conditions referenced in the literature review. The investigation of the participants was therefore based on factors that influence transfer and conditions of transfer.

A critical review on the ICT skills educators' training programmes was also undertaken. For the same reason that the study investigates the transfer of learning by teachers from the computer course to their work environments, evidence was provided in the literature review, providing the reader with "evidence of whether or not the concepts and relationships apply to the situation and if so what form do they take here" (Motaung citing Strauss and Corbin, 2002: 39). The literature study enabled me to gain further insights from this study and consequently, to become sensitive to when reviewing the data. Therefore the researcher was enabled to establish the relevance of the theory to this study. As such, reviewing the literature has enabled me as researcher to contextualize my study in order to argue the case (Henning et al., 2004:2). Motaung (citing Strauss and Corbin) contends that the literature review "stimulates theoretical sensitivity by providing concepts and relationships that are checked out against actual data" (2002:39).

Most importantly, the literature review also increased my confidence in this study, when I realized that others have interest in this topic and have invested time, effort, and resources in studying it. The literature review further provided me with new ideas and approaches and lastly it showed me that others have handled methodological and design issues in investigating such similar phenomena (Leedy & Ormrod, 2001: 70).

### 3.3 RESEARCH APPROACH

To extract meaning from the collected data, a research methodology that is mindful of “the nature of the data and the problem” (Leedy & Ormrod, 2001:100) was employed. In this regard, I chose a qualitative research approach, since it is relevant and appropriate in order to address the fundamental questions about this study. The following assumptions support the use of a qualitative approach in this study:

- It is indicated in the introduction of the research study that the study describes and proposes the experiences of the participants in this study, which is qualitative approach.
- It is clear from the introduction that my point of view is personal, informal and it has lessened the distance between me as a researcher and the reader.
- My research question has “two forms: The grand tour and subquestions”. My grand tour is: To what extent do teachers transfer learning from the EMPC to their work environments”, and is followed by three subquestions.
- In the literature review I have used inductive reasoning, in that there are multiple possible views on transfer, transfer of learning, conditions of transfer and factors that influence transfer of learning, being constructed by different individuals.
- This is a qualitative case study, which looks at a small group of participants. White cites Welman and Kruger who explain the case study as being characterized by a limited number of analysis ( White, 2003: 49). In this study, the unit of analysis is twenty teachers.
- Leedy and Ormrod (2001: 23) explain the case study as “a particular individual, program, or event that is studied in depth for a defined period of time”. Merriam, Yin and Creswell are cited by White indicate that in a case study, the researcher explores a single entity or phenomenon bound by time and activity and collects detailed information by using a variety of data collection procedures during a sustained time (White, 2003: 49).
- As a qualitative researcher, I considered the following conditions in my study as outlined by White (2003:16).

- Looking at people and settings holistically
- I am sensitive to people's responses
- I try to understand people from their own frame of reference.
- I set aside my own beliefs, perspectives and predispositions.
- For me, all perspectives are valuable.
- I emphasise validity in my study.
- I am the primary instrument for the data collection and analysis

I further considered Creswell's (2002: 181-183) recommendations as a qualitative researcher:

- I used multiple methods for data collection. In this particular case, of investigating the way teachers transfer their learning for the computer course to work environment, I observed, interviewed teachers and school managers, and interpreted the examination results of the students
- My research is emergent rather than tightly prefigured. The themes emerged from the coded data. I analysed and interpreted the data, hence my research is interpretative.
- I used inductive reasoning in my study.

### **3.4 RESEARCH METHODS**

The research design is the complete strategy of attack on the central research problem, which provides the overall structure for the procedures that the researcher follows, the data the researcher collects and the data analysis that the researcher conducts (Leedy & Ormrod, 2001: 91). I chose the case study as a research design for this study because a case study is considered especially suitable for learning more about a little known or poorly understood situation. Bell defines a case study as “an umbrella term for a family of research methods that have a common purpose of enquiry around an instance” (2000: 10). Conversely, Leedy and Ormrod contend the disadvantage of making an enquiry around an instance, by indicating that the results of a single case being studied cannot be



generalized to other situations. A case study focuses on one or few cases within its or their natural setting (Bell, 1998:10). This study is an embodiment of such a case, because it investigates the transfer of learning by teachers who attend a basic computer course at the EMPC. Little is known about the extent to which transfer take place in the teachers' workplaces, where the participants are observed in their natural setting.

Creswell (2002: 36,37) describes a case study as being characterized by a problem, context, issues, lesson learned, bounded to time and place, and also by description of context. Furthermore, Bell (1998: 11) indicates that "a case study allows the researcher to concentrate on a specific instance or situation and to identify, or attempt to identify the various interactive processes at work" Therefore the study is characterized by the flow of events as described by Creswell. A case study is appropriate for individual researchers because it gives an opportunity for one aspect of a problem to be studied in some depth within a limited time scale (Bell 2000:10), being conducted by a single person (Bell cited by White, 2003: 19). In this study I am the sole researcher of this study



The purpose of the case study is to study the situation in great depth (Bell, 1998:36): This study has given me an opportunity to concentrate on exploring things in more detail, in order to discover things that could not have been discovered in other strategies, but spotlighting on one instance. White quotes Bell who contends that a case study's defining characteristic is that it focuses on just one instance or phenomenon that is to be studied or investigated in some depth but within a limited scale (Bell, 2000:10). For this reason, the study focuses on participants' ability to transfer computer skills to their workplaces. As a case study is an "intensive, holistic description of a single unit" (White, 2003:19), I provided an intensive description of the participants, their computer skills training programme and the extent to which they transfer their learning in their work environments.

A case study should focus on relationships and processes (Bell cites Nisbet and Watt, 1998: 36) tending to be holistic than deal with isolated factors. It offers me an

opportunity as a researcher to explain why certain outcomes might happen. In this study, the conditions of transfer and factors that influence the transfer of learning are investigated. A case study will attempt to answer the question `why`, and `how`. The `how` question is captured in the research question and the `why` question is answered in the rationale of the study which provided reasons for undertaking this study.

In addition, the situation should be studied for a defined period of time (Bell, 1998:10). In this study, the problem under investigation is undertaken within a period of six months but a researcher needs to collect “extensive data on an individual situation on which the investigation is focused” (Leedy & Ormrod, 2001:150). I collected intensive data by means of interviews and observation and the use of audiovisual materials. I spent an extended period of time on site and interacted with regularly with the participants in order to determine the extent to which the participants can transfer the computers skills learnt in three hours for six months to their work environments. A case study is typified by the researcher’s recorded details about the context in which the case is found which enables the reader to draw conclusions about the extent to which the findings might be generalisable to other situations (Leedy & Ormrod, 2001: 150). Denscombe (quoted by Bell, 2000:11) points out that the “extent to the findings from the case study can be generalised to other examples depend[ing] on how far the case study example is similar to others if its type”. (Bell citing Bassey 2000:12) uses relatability which refers to the extent to which the details are sufficient and appropriate for a researcher to relate his or her decision making to that described in the case study instead of generalizability. I will relate my findings with other studies.

### **3.5 DATA COLLECTION TECHNIQUES**

Leedy and Ormrod define data as those pieces of information that any particular situation gives to an observer (Leedy & Ormrod, 2001: 94). I used interviews, observation and results of examination for data collection. Data was collected from mid-March to August 2006.

### **3.5.1 Observation**

The researcher observed three teachers from two different circuits in their respective schools, two primary schools and one secondary school, for 30 minutes, once a week for the two months, concentrating on the ways in which the skills are transferred in teaching and learning. Direct observation gave the researcher an opportunity to discover whether people do what they do or behave in a way they claim to behave, hence participant observation was employed (Bell, 2000:157-158) (see Appendix B for the observation results).

### **3.5.2 Semi-structured interviews**

I conducted an in-depth semi-structured interviews, in order to encourage the participants to talk about what is of central significance to them rather than to me the researcher, but making sure that all topics crucial to my study are covered (Bell, 2000:138). The in-depth interviews included a 40 minute video recorded interview with 10 teachers. Five informal follow up interviews with individual selected teachers for 30 minutes each, was conducted, wherein I used my diary to take notes. Open-ended questions were asked in order to give participants the opportunity to say what they experienced and “steer” them in the right direction, by using probes and prompts (Gillham, 2003:14).

### **3.5.3 Examination results**

The participants completed a computer based examination based on two modules, MS Word and MS Excel to assess their proficiency at the end of the course (see Appendix F). Participants had to apply the computer skills they had learnt when using the computer to complete the examination. Scores were allocated for each of the tasks being assessed.

### 3.6 DATA ANALYSIS

In this section, I made sense out of the data I collected (Creswell, 2003: 190). In this study, my data analysis was purely content analysis. Content analysis is about “organising the substantive content, by identifying those key substantive points and putting them into categories (Gillham, 2003:59). Secondly, I obtained a general sense of the information and reflected on its overall meaning. Thirdly, I coded, which is the process of organizing data into categories and labelling those categories with a term based in the actual language of the participant (Heaton, 2004: 98).

For this study I used open coding, wherein I read the collected data in order to get the global impression of the content (Henning et al., 2004:104), by I applying Tesch’s eight steps quoted by Creswell (2003:192) to analyse the data. I read all the records that I had, to get the sense of the whole. I interpreted the meaning of all the interviews in order to get the underlying meaning. The coding process was used to generate description of setting as well as themes or categories for analysis. I then made a list of all the topics and clustered them according to their relationship, revisiting the data to see if new categories and codes emerged. I categorized the topics using common description in order to reduce the data. I made a final decision for each category, assembling data belonging to each category in order to perform a preliminary analysis

Lastly, to make meaning of the data, I asked: “What were the lessons learned” (Lincoln & Guba quoted by Creswell, 2002: 194).

White refers to this data analysis process as an “inductive process of organizing the data into categories and identifying relationships among the categories” (2003:82). Similarly, Leedy and Ormrod contend that qualitative researchers use inductive reasoning, by making specific observations and then drawing inferences about larger and more general phenomenon (2001:103). Although inductive reasoning is used in qualitative analysis, the deductive process is used to verify or modify an identified theme in the collected data (Leedy & Ormrod, 2001:103) White further contends that “qualitative analysis is a

systematic process of selecting, categorizing, comparing, synthesizing and interpreting to provide explanations of the single phenomenon of interest” (White, 2003:82).

I used triangulation as a last step for data analysis. Triangulation means collection of multiple sources of data with the hope that they all converge to support a particular hypothesis or theory (Ormrod & Leedy, 2005:105). Furthermore, Bell (1998:102) quotes Open University course’s definition and describes triangulation as “cross checking of certain phenomena and the veracity of individual accounts by gathering data from a number of informants and a number of sources and comparing and contrasting one account with another in order to produce as full and balanced a study as possible.” I triangulated different sources of information by examining evidence from sources and using it to build a coherent justification of themes (Creswell, 2002:196). Therefore, as a case study researcher, I definitely looked for convergence of data, where many pieces of information point to the same conclusions. Hence, observations, interviews and examination results helped me to look for common themes that appear in the data gleaned from the three methods which I then reflected on.

### **3.7 VALIDITY/ RELIABILITY/ CREDIBILITY OF THE STUDY**

Validity does not carry much connotation in qualitative research, but it is used to determine the accuracy of the findings from the researcher’s standpoint or readers of an account (Creswell, 2003:195). However, Lincoln, Guba and Creswell (cited by Leedy and Ormrod, 2005:105) suggest that the words credibility, dependability, confirmability, verification and transferability be used instead of the term validity. The five strategies have been used in this study.

#### **3.7.1 Credibility**

As a qualitative case study researcher, I used triangulation to support the credibility of my study. Triangulation is the technique that compares multiple data sources in search of common themes to support the validity of their findings (Leedy & Ormrod:2001:105).

I applied some of the strategies identified by Leedy and Ormrod applied in triangulation (2001:106) such as negative case analysis where I actively looked for cases that contradict existing hypotheses, and then continually revised my explanation and ensuring thick description by reporting the findings in detail so that the reader can make his or her own conclusions from the presented data.

### **3.7.2 Transferability of the findings/External Validity**

Transferability or external validity “concerns whether the results of the research can be generalized to other situation: populations, different subjects, settings, times and occasions” (White 2003:22). Leedy and Ormrod further define external validity as “the extent to which the conclusions to which the results can be generalized to other contexts”(Leedy and Ormrod, 2001:105). Creswell contrastingly indicate that “in a case study, the researcher is not looking for results that can be generalized, but rather examine whether results can be replicated in different contexts (2002: 47). In order to enhance external validity, Leedy and Ormrod suggested three strategies:

- A real life setting
- a representative sample
- Replication in a different context

The results of this study cannot be generalized, for the study is typified as a case study. Hence, this study is qualitative research which takes place in the natural setting (Creswell, 2002:181). Similarly, Bell (2003:11) also confirms that this study cannot be generalized since, a single researcher has gathered all the information, which makes it difficult to cross-check information and information might be distorted. However, Denscombe (cited by Bell 2003:11) disagrees and contends that findings of the case study can be generalizable if the case study example is similar to others of its type. However, for this study, the concept generalisability was replaced by transferability (Heaton 2004:100). Bassey (cited by Bell) uses the term relatability instead of generalisability, which means the extent to which the details are sufficient and appropriate for a researcher

working on a similar situation to relate to his or her decision making to that described in the case study (Bell, 2003:12). Therefore, the findings of this study are not intended for generalisability, but can be related in similar situations (Bassey cited by Bell, 2003:12). The findings in this study can be tested by comparing them to the existing literature review.

### **3.7.3 Confirmability of the findings**

Motaung defines confirmability as “attesting that the findings are supported by the data and are internal coherent” (Motaung, 2002:48). To confirm the findings of the collected data, I applied one of Leedy and Ormrod’s strategies (2001:106): Extensive time in field by spending six months studying the case. I formed tentative hypotheses, and continually looked for evidence that supports or disconfirms my hypotheses. Similarly, White contends that prolonged and persistent field work allows interim data analysis (White, 2003:24).



### **3.7.4 Verification**

To verify the collected data, I used tape recorders, photographs and videotapes. I used what White calls “participant review”, where I asked each participant to review the synthesis of all the interviews (White, 2003:24).

### **3.7.5 Dependability**

Motaung (cites Lincoln and Guba), defines dependability as “a process of the inquiry and the appropriateness of inquiry decisions and methodological shifts” (2002:48). I applied some of Leedy and Ormrod’s strategies (2001: 105) by getting feedback from others, asking the opinion from colleagues in the field and gained respondent validation by taking the conclusions back to the participants.

### **3.8 SUMMARY**

This chapter has dealt with the logic of research. The role of the literature review was given, followed by a description of the research approach, the research method, data collection techniques, data analysis and the trustworthiness of the study. It was highlighted that the research type is a qualitative case study. The unit of analysis was specified as twenty teachers who attend computer course at a former teachers college. Inductive logical reasoning was employed to analyze the collected data. In the end, I constructed narratives to interpret the collected data which are presented in Chapter 4.





## CHAPTER 4

### FINDINGS: TEACHERS' ABILITY TO TRANSFER COMPUTER SKILLS TO THE PRACTICE SETTING

#### 4.1 INTRODUCTION

This chapter reports the findings of the case study presented in the constructed narratives. The collected and analyzed data reflect the way in which participants transfer their computer skills acquired at the EMPC to their work environments. The methods used to collect data were in-depth semi-structured interviews, observations over a 3-month period and the results of a computer-based examination. In the following paragraphs, analysis of the data are discussed, followed by a discussion of the findings.

#### 4.2 STUDENTS' PERFORMANCE IN THE COMPUTER COURSE

Official records were an important source of information, and at the end of my study I went to the EMPC, which kept the official records of the ten students. I looked into their assessment records, based in part upon one formal examination that consisted of two papers, one for *MS Word* and the other for *MS Excel* (see Appendix F). These were saved on the computers, from which the participants had to retrieve them, and answer the questions. The results of the students are reflected in the table below:

Table 4.2.1: Students examination results: MS Word and MS Excel

STUDENTS	POST	MS WORD RESULTS	MS EXCEL RESULTS	TOTAL	AVERAGE
Adding	E	70	80	150	82
Being	E	89	84	173	82.5
Caring	E	78	76	155	87
Doing	E	77	98	175	91
Eating	E	80	82	162	87
Forming	E	74	75	149	87
Going	E	78	95	173	87.5
Hiking	E	88	88	176	84
Itching	E	78	89	167	91.5
Jogging	E	80	77	157	81
Total	E	797	844	1641	
Average	E	79.7	84.4		82.05

It is clear from the table that all students did well in the examination for both *MS Word* and *MS Excel*, with them obtaining similar marks for both, to such an extent that the differences ranged from 1 to 10, except three students whose marks differed so much that the differences ranged from 11 to 21. There is no great difference between the average of the two modules, which is 4.7, which reflects that the performance in the two modules was nearly the same. However, the *MS Word* examination question paper reflected that the type of questions asked required students to apply the skills for personal use, not for teaching and learning. For example, students had to make bold, italicize, change font size and font type. Meanwhile, the *MS Excel* examination questions required the students to apply skills that could be applicable for teaching and learning. For example, they had to calculate totals and averages, and arrange the marks in ascending order. All students passed the examination, indicating all had acquired certain basic computer skills.

### **4.3 STUDENTS' EXPERIENCE OF THE COMPUTER SKILLS COURSE AND THEIR ABILITY TO TRANSFER SKILLS IN THEIR SCHOOLS**

After analysis of the data, by means of open coding techniques (see paragraph 3.6), the data yielded several categories of experience of the computer skills course. These are now discussed.

#### **4.3.1 The course presenter's style affected the learning during the course.**

One student indicated that the presenter's style lacked accommodation of individual differences among them: **"the teachers who coped so well in the course had to move in the same pace with slow ones"** (line 58). Consequently, some students regarded the course presenter as being patient: **"I had no computer skills before, that is why I was not allowed to attend the Intel Teach to the Future, Facilitator's course last year in 2005"** (line 11-13). The course presenter was condescending to the students, to such an extent that their learning was affected: **"I feel childish when she touch types for me, so that I can type as she does"** (line 168). Although the presenter used to move around, the students further felt that she was condescending towards them: **"She moves around and puts our fingers in the correct keys for the home row"** (line 40-41). The presenter's style affected the students' learning negatively, and that led to the inability to transfer their learning: **"I become frustrated when she stops me from using one finger to type for all keys"** (line 173). The course presenter seemed to forget that the students were adults and treated them as children: **"the trainer should not do anything for us the trainees, but should explain in such a way that the trainee can do or perform the skill on his /her own"** (line 89-90).

Although some students felt the course presenter was condescending towards them, some students acknowledged that they had the course presenter's full support: **"our presenter is very much patient with some of us who do not put the correct fingers in the home**

**row. She moves around and puts our fingers in the correct keys for the home row”** (line 39-40). This is evident in the presenter starting from scratch with the participants, and not assuming that the participants might have some basic skills, such as switching on and off a computer: **“I learnt how to put the computer on and shut it down, use of a mouse** (line 29). It seemed that the way the course was presented tended to have an influence on the teachers learning and ultimately influenced their application at schools.

#### **4.3.2 Students did not believe that the course content was appropriate for teachers’ application**

Many students had serious concern about the course content and their ability to apply it in their schools. In comparison to students’ concern, Phillips and Broad (1997:9) have also identified course content as one factor that affects transfer and hence categorized trainees’ views of the training as irrelevant, as a barrier to transfer (See paragraph 2.3.4). Many students did not know the reason for learning the touch typing skills: **“she was concentrating too much on touch typing skills”** (line 35). For instance, they did not consider touch typing an important skill for them: **“touch typing should not should not be prioritized”** (line 91). The students were frustrated about the touch typing skills that they learnt, but could not find any way in which to apply the skills in their schools for teaching and learning. One student expressed his frustration openly and harshly: **“our course presenter should consider the fact that we teachers, not administrators or secretaries”** (line 92-93). Another student expressed his disappointment about the relevancy of the course content in their daily profession: **“if the course could empower us as teachers to use computers for teaching and learning, not just to type the lesson in a computer and print for filling** (line 97-98). Many students expressed serious concern about the presenter’s emphasis on touch typing skills, for example: **“touch typing should not be an emphasis in the course, but more advanced programmes should be done”** (line 163-164).

One could assume that the course presenter might have taken the course as a *computyping* course. Some of the students commented on the presenter’s over-concentration on touch

typing: **“I do not like it when our trainer keeps on showing me position of my finger in the home row** (line 168). The students needed to learn the skills that are appropriate for application, and as one said: **“I am not interested in touch typing, all I need to know is, to use a computer for personal use and for my learners in the classroom”** (line 170-171). The students further expressed their frustration about the touch typing skills that they considered inappropriate for application: **“I don’t think she needs to worry about my typing speed. For me, it makes no difference whether I use correct fingers or not, as long as I have typed the correct words”** (line 174-175). They were very much dissatisfied by course content that is inappropriate for application: **“we are the trainees who are going to use the skills we learnt in our schools** (line 86).

The students were so concerned about the course content, that they went to the extent of questioning the designers of the programme itself: **“I wonder if the designers of our programme really know the computer skills relevant in our schools”** (line 87-88). One student further emphasized the relationship of the course content and her job: **“touch typing as the course content is not much relevant for my job as a teacher** (line 148). It is evident that the students’ practical tasks were not appropriate for their application as indicated by some students: **“the tasks should make me realize the way in which I can use the skills for teaching and learning in the classroom situation”** (line 115-116). Students further questioned the course content, for them to be able to apply: **“the test should cover more skills that I can use in class”** (line 120).

Some suggested that the course content might have been appropriate for skills other than touch typing: **“I thought I would be having my own e-mail address by now, but I don’t have. I do not know how to send and receive an e-mail.”** (line 240-241). The student further suggested the content that might have made a difference for their application: **“I think preparing a lesson and presenting it through a computer, can help a lot during teachers’ absenteeism”** (line 99-100). One student expressed his disappointment with the course content, because he felt it would prepare him to fit in the 21<sup>st</sup> century, highly influenced by technology: **“I still have to go to the *Internet Café* to get information, and I am so worried that I still have to ask the *Internet Café***

**assistant to do everything for me** (line 243-244). The student further explained her frustration, **“I feel small, because very young people download the information on their own”** (line 250). Some of the students expressed serious concern about learning in context, so that they can transfer their learning: **“the course content was too easy, but I did not learn the way in which I could apply the content to my everyday teaching, except typing my learning programme, work schedule and lesson plans, and printing them, then file them. I could not relate in any way my application of course content in my class by observing my presenter.** (264-266). Their need to learn in context for application was further emphasized: **“during the course, I could not find any way in which my new knowledge could be used at my school”** (line 205). The typing skills that the students complained about were not assessed in the examination. One would wonder why the course presenter bothered so much about the skill: **“I wondered why our course presenter took so much time in touch typing, but could not test us on them”** (line 272-273). It seems that the students considered that much of the course content was not that relevant and would have little use for them in their practice.



#### **4.3.3 Students were not satisfied with the extent to which their learning was monitored and the way of giving feedback**

It is evident that the course presenter did not monitor the progress of the students, as one student expressed concern about the way the course presenter assessed them: **“I think our presenter should mark all the tasks she gives us in order to monitor our progress”** (line 94-95). Although these students were adults, they needed to be assured that their progress was being monitored: **“she used to give us some tasks (small projects) based on the work covered on that day, to do in the class. We never submitted the tasks for assessment. Our presenter moved around and ask, ‘Have you finished? If not, come on Thursday to finish’. I did not attend on Thursday, for I knew she was not going to mark it and it wasn’t for assessment** (line 64-68). Another student was concerned about the way in which their progress was monitored: **“I do not think my presenter was monitoring my progress** (line 71). One student

suggested the form of feedback that would be meaningful to them: **“the marked tasks should have more detailed feedback than making oral comments only”** (line 95). One would assume that it would not be easy for the students to transfer their learning in this situation, where there was no follow up on their work: **“the feedback that I got from the task was not helpful, because it was not detailed”** (line 69). The student further indicated the form of feedback that the course presenter gave: **“she would comment about some of us who did not finish the class practice tasks”** (line 70). One student further emphasized their need to have detailed feedback: **“the feedback that I got from the task was not helpful, because it was not detailed”** (line 71). It seems that students needed their learning to be monitored and feedback of the given tasks to be more detailed.

#### **4.3.4 Students believed that the support by management in schools is an important factor for their learning**

Phillips and Broad, (1997:9) contend that non-supportive organizational structure is a barrier to transfer of learning. Phillips (1997:11) further argue the importance of management support for transfer of learning, stating that managers need to create opportunities to use new learning and give feedback following training (See paragraph 2.3.4). Similarly, some students indicated the lack of support from the management affected their ability to transfer their learning in their schools: **“the Deputy Principal displays some attitudes towards me and she makes remarks such, “why do you leave your class unattended and sit in the manager’s office?”** (line 141-142). One participant emphasized the need for support from the management team: **“school managers should create opportunities for us trained teachers to apply our skills in our schools”** (line 166).

Consequently, one student indicated with confidence the kind of support she gets from the school that enables her to apply the skills: **“I am lucky in our school because I have a supportive manager”** (line 198). She further explained the kind of support her school manager gave her: **“he has bought encyclopedias CDs”** (line 200). One school manager

explained with pride, the way his school benefited from his teacher who attended the course: **“I have one teacher who attended the course and our school benefit a lot from her. She types official letters”** (line 45-46). The full support that the school manager gave the teacher, motivated her to do her best. The school manager motivated the student to learn from her mistakes and explained with excitement: **“at first she used to type the official documents with some mistakes, but I kept on encouraging her to take her time and retype and read it before printing. She used to be slow in typing, but her pace is improving day by day”** (see Appendix C, line 47-49). The school manager further expressed the way the school benefits from the teacher: **“we have three computers from Limpopo Department of Education that we received last year April, but they have been used for the first time by this EMPC course attendant”** (line 50-53). The school manager was very proud in the way his teacher applied the skills and indicated, **“this teacher’s file is neat and presentable. Her learners’ CASS files came first in the Bohlabela district and this makes me proud. We used to get CDs for career from the Limpopo Education Department, and we never used, but because of this teacher’s skills, our grade twelve learners got valuable information from these CDs”** (line 51-56).

Another school manager stressed the importance of creating opportunities for the students: **“our school will have a computer room so that our learners can be taught the computer skills by these trained teachers”** (Appendix C line 9-10). The school manager further supported the students in applying their skills: **“I expect the trained teachers to teach the management team and other teachers the skills they have acquired at the EMPC”** (line 15-16). Another school manager was confident about the course and also supported her teachers attending the computer course: **“I do not worry a lot about the unattended learners, as long as the teachers are empowered in computer skills and our school will benefit from them”** (line 21-22). Although, the school manager had further pointed out some of the challenges faced by his school, his teachers still had his support. Some of the challenges faced by the school were: **“yes, their attendance does disrupt classes, for the teachers have to leave earlier before school goes out. The learners are attended to by the remaining teachers, but it is not**



easy. **The remaining teachers have to leave their own classes unattended to keep order in those teachers' classes. Teachers do complain about these teachers** (line 3-7).

The manager stressed the seriousness of the challenges: **“it is difficult for the remaining teachers to look after their learners especially the grade ones need full time attention”** (line 18-19). Another school manager indicated that opportunities created for students to apply their skills, though students did not always utilize them: **“if I ask one of the teachers attending the computer course at the EMPC to type any document, it takes him or her hours to type a small document and the document will have a lot of mistakes** (line 26-28). The students shifted the responsibility, as indicated by one school manager: **“the training teacher usually shifts the responsibility to the teachers who used to type, those have not been trained at the EMPC. If I insist that the training teachers should be given a chance to apply their skills, they will call the other teachers for assistance. At the end of the day you will find the other teachers trained in the other institutions doing typing for them”** (line 29-34). It seems that students consider management support an important factor for their learning and ability to transfer.

#### **4.3.5 Peer support and acknowledgement was considered important factors for students' learning**

It is evident that support is considered an important factor in transfer of learning. Some of the students did not get support from their colleagues which affected the reinforcement of their skills. In some schools where students had no computer skills, their colleagues did not try to teach them the basic skills, such as switching on and off the computer: **“I remember the day I switched off the computer's power button after use, my colleague was very angry with me, saying that I had not switched off the computer properly”** (line 5-7). The student's colleague made the student uncomfortable: **“I thought that my colleague was trying to make fun of out of me”** (line 8). The participant student expressed his anger: **“I became angry too, and I stopped helping my**

**colleague in fast typing.”** (line 9-10). Some of the students’ colleagues seemed to be self-centred, and they did not want to teach or support their colleagues who were just developing their newly acquired computer skills. One student indicated that they enjoyed the support of their peers but also found it necessary to be partially independent in using the computer to reinforce the skills: **“the sad part was that my colleague had to sit by my side to click, save, print the documents and shut down the computer”** (line 24-25). The student’s colleagues made negative remarks that de-motivated the participant and had a negative effect on the continued application of skills: **“every time when I use the computer in the principal’s office, my colleagues make some bad remarks saying that I have taken the Deputy Principalship post”** (line139-140) and **“my colleagues would pass remarks such as: ‘You type very slowly’”** (line 144). Another student expressed concern about his colleagues’ attitude,: **“my colleagues pass bad remarks when I type question papers for my Learning Areas saying that my learners cannot read from a chalkboard and that I am making their reading problem worse by giving them as primary school learners question papers”** (line 177-179). It seems that some educators are resistant to change (see chapter 2, paragraph 2.4.3.2) especially in the area of incorporating ICT in their practice and tend to mock at their peers when they display skills in using technology.

However, some students were acknowledged, and this gave them the motivation and opportunity to apply their newly acquired technology skills in helping their peers: **“teaching other teachers boosts my confidence in computers. I learn new skills that I never got from the EMPC each day, like changing the case of my text from lower to capital and vice-versa”** (line 244-245). Another student indicated the confidence and trust that her colleagues have in her: **“I am teaching one teacher who has bought a new computer some basic computer skills at her home”** (line 218). Being given support and acknowledgement by peers, time to practice their newly acquired skills and the motivation to apply them is an important factor for their learning and ability to apply transfer of their learning.

#### 4.3.6 Access to resources was considered essential for successful learning

Support from the learning materials distributed by the presenters of the course, especially the notes seems to have been limited: **“in a way, I can say they partially supported my learning. The notes were very brief. Our presenter handed us some few notes, but she never referred to them. For instance, in the notes they will then tell me to maximize or minimize the screen, but do not show the maximize icon”** (line 42-44). The notes, if structured correctly with simple explanations and illustrations, should have supported the students in practising some of the skills learnt during the course and this reinforcement would have facilitated the transfer of the skills to their practice. Students further indicated that the learning materials were inadequate and made it difficult to learn: **“the handouts have very brief notes, they are not detailed. Some of the photocopied handouts are invisible”** (line 46).

The students found it difficult to use the notes on their own to develop and enhance their learning, but depended on the course presenter to show them what to do: **“it was not easy for me to work on my own using the notes only. I needed my presenter or someone to tell whereto click when I want to maximize my screen** (line 51-52). **Yes, but not fully supportive** (line 53). **In a way, I can say they partially supported my learning. The notes were very brief** (line 54-56). **For instance, I did not get the detailed steps on saving my work correctly. I once wrote a practical practice task, but failed to save my work** (line 52-53)”. This indicates that the students needed to practice the various steps in order to develop the newly acquired skills.

Some of the students were concerned that the learning outcomes were not met. One would wonder about the reason for the course presenter leaving out some of the outcomes. It is evident that the course presenter could not cover all the outcomes, because she spent much time on typing skills (see paragraph 4.3.1) The outcomes which were not met might have impacted negatively on the students as they tried to apply their skills in their schools: **“the notes are written according to OBE approach, they also have the Outcomes, but most of the specified outcomes were not met”** (line 47-48). In some of

the schools, students do not have access to computers and that impacted on their learning and their ability to apply their skills (compare paragraph 2.3.2).

One student expressed concern at not having easy access to computers: **“I do not feel comfortable to work in the principal’s office** (line 143). I also observed one student in one school who could not get access to the computer in the school manager’s office, because the school management team were holding a meeting in the manager’s office. One student further indicated: **“I have limited access to computers”** (line137). It is evident that student resources such as learning materials to allow students to reinforce their learning and access to computers to practise their skills is vital in developing technology skills.

#### **4.3.7 The context in which students had to transfer their skills was not conducive for transfer**

At one school I observed that three learners shared one computer, which led to a fight amongst them. Another participant confirmed my observation: **“my school does not have enough computers for the learners. My class is overcrowded and even if I can try to group them, it can take me two weeks to let each learn touch computer”** (line 149-152). I further observed at the secondary school that: **“my school [only] got three computers from the Limpopo Department of Education”** (line 181). In many cases, teachers have to search for information and print it for their learners: **“he has bought encyclopaedia’s CDs and I download and print information from the encyclopaedia for learners when they have their assignments in any learning area”** (line 200-201), instead of giving learners the chance to search on their own. Many schools are unable to buy enough computers and maintain an Internet connection so that learners can search information on their own. Some students further indicated that: **“my school have computers too, but I do not think in my school I will ever use computers for our learners. Our learners cannot read and write, grade sevens as well”** (line 150-152), which is a further de-motivating factor for applying their skills. It seems that the contexts under which students had to apply their skills are not conducive for transfer.

#### 4.3.8 Insufficient time to acquire skills affected students' learning

Scribner and Cole (cited by Beard, 1993: [Online]) suggest that transfer may depend on extensive practice of the performance in question in a variety of contexts. Similarly, the students were not satisfied about time for practice so that they could apply the skills independently in their school. One student expressed his concern: **“I am not satisfied with her presentation styles, because the presenter took too much time concentrating on the slow ones** (line 57-58). Students found it difficult to attend the course as they had other school commitments: **“in July after the re-opening of schools, we could not attend the course, because our presenter was busy with the grades’ twelve trial examinations. We resumed our course on the last week of August”** (line 78-79). This interruption to the course could have had some effect on the continuous learning of the students.

One student further expressed concern about the duration and time organization of the course as this may also have influenced their ability to transfer their skills: **“I would like to have more practice time. The course should be done in one full year. Few days should be used for holidays and the most days be for the attendance of the course”** (73-74). They further indicated their dissatisfaction about designated time of the course: **“Thursdays should as well be taken as a compulsory attendance days for us all, not for attendance by those who have to finish up their tasks”** (line 111-112). It appeared as though the course presenter took more time doing theory work, while students wanted more time to be spent on practical work: **“I need enough time for practice than doing the theory work. To me knowing the definition of concepts is of no help, we should take most of our class time sitting on the computer. More time should be spent on keyboard keys and how to use short cuts”** (line 257-260). Another emphasized the importance of having more time for practice: **“enough time should be allocated for practical work”** (line 89) as this would allow the students time to reinforce the learning and practise the newly acquired skills. It is evident that student needed enough time for practising newly acquired skills in order to apply them in their schools.

#### **4.3.9 The nature and scope of assessment were not appropriate and supportive for learning in context**

The students felt that the tasks given to them by the course presenter were not appropriate and did not allow effective application of their skills. Schwartz, (Vol.4:1449) has contended that transfer of learning depends on knowing the context in which a particular skill is useful. It is indicated by some students who wanted to see the relationship of the learning content to their teaching profession: **“the trainer should give us more challenging tasks that could take us three days or a week to submit, as long they are related to our teaching professions”** (line 113-114). Some students realised that they needed to learn in context, so that their learning could be transferred in their schools: **“the tasks should make me realize the way in which I can use the skills for teaching and learning in the classroom situation** (line 115-116). They also explained that **“the course content was too easy, but there I did not learn the way in which I could apply the content to my everyday teaching, except typing my work programme, work schedule and daily preparations and printing them, then file them”** (line 265-267).

Many students did not like the way the course presenter assessed them, one voicing disappointment that: **“the examination was too easy”** (line 261) and some students' comments highlight that the examination did not test the skills that they need to apply in their teaching: **“I had to reproduce the content of the course, without much reflection on the use of computers in the classroom.”** (line 262-263). Furthermore, the students were disappointed about one summative assessment that was used, saying that **“the course presenter should use continuous assessment for the course, not just one test. The class practice tasks should be marked and detailed helpful comments be given”** (line 109-110). It seems that the students would have appreciated constructive feedback which would help them with the learning process. Students stressed the low standard of the examination, which was inappropriate and non-supportive for their learning and ability to apply the skills: **“for an example I did well in the test, because I could bold,**

**italise, underline, cut, copy and paste, use the font and size, identify font type**” (line 122-123).

The inappropriateness of the examination is further indicated by another student, who expressed his concern about questions: **“in the examination I had to cut or copy paragraph x and paste it somewhere. I had to identify the font type or size for sentence y by selecting it”** (line 324-325). It was indicated by many students that the course emphasized typing skills, but could not assess them: **“the assessment did not test our typing skills as such”** (line 319). It seems the nature and scope of assessment was not appropriate and supportive for learning in context and ability to apply their learning in their various schools.

#### **4.3.10 Students’ lack of confidence affected their ability to acquire computer skills**

Some students had negative attitude towards technology, and could not make the best use of the opportunity to learn new skills that they could at school. Age was used as an excuse to acquire computer skills: **“I feel that I am too old to learn new skills, like touch typing”** (line 170). Some of the environmentally-deprived older students did not want the opportunity to be exposed to computers. It seemed some teachers were not confident about learning computer skills before attending the course: **“I was so scared to touch any key in the keyboard, thinking that I might break it”** (line 3). Another student had typing skills as her foundation, but did not have confidence to utilize them in order to learn computer skills even with assistance from her colleagues: **“I did not have computer skills, but I had typing skills that I had learnt in typing with a typewriter, in high school”** (line 4). Lack of confidence led her to a situation where: **“one of my colleagues had to put on the computer for me and I applied the typing skills to type the SGB invitation letters and minutes faster”** (line 22-23). If the student had confidence to explore, she could have asked her peer to teach her. Surprisingly, the student with typing skills blamed herself when applying her typing skills in a computer. She did not regard herself as a learner, transferring her typing skills from the typewriter to a computer. She had lost the opportunity to learn and lamented: **“I felt so stupid**

because of the difference in pressure applied in a keyboard and a typewriter. I used to press hard on keyboard keys and that resulted in my documents having lot of mistakes (line 25-26). However, one could wonder why she said: “**my colleague had to check the spelling**” (line 28), and she had not asked her colleague to show her how to use the spell-check tool.

Some of the students were ignorant about learning computer skills: “**I never used the computer skills before the course. I used to ask one of my colleagues who learnt the computer skills in one institution, not the EMPC to type class lists and my personal documents such as CV and application letters**” (line 19-20). Some of the teachers do have resources, but lack confidence to integrate computers into their classrooms: “**I have the lessons neatly arranged in my file, but there is nobody to teach my learners when I am not in, but computers are there at our school. It worries me a lot when I still use a piece of chalk and chalkboard for teaching and learning**” (line 105-107). The student continued blaming others for her inability to use computer skills for teaching and learning: “**my school does not have enough computers for the learners. My class is overcrowded and even if I can try to group them, it can take me two weeks to let each learn touch computer**” (line 190-193). Another blamed the learners for their inability to read, but lack of confidence disabled her not to see the opportunity to utilize her computer skills, in order to help the learners to improve and he made this excuse: “**my school have computers too, but I do not think I will ever use computer for our learners. Our learners cannot read and write, grade sevens as well** (line 196-197).

Some of the students do have resources, but had no confidence to use them: “**my school do have computers, but I do not know what to use them for, whether to teach my learners touch typing skills of which I cannot do well** (line 153-154). Another student explained that “**my school also have computers, but I do not know how to prepare lessons and present them with a computer** (line 156). He further said,” **all the lessons I retrieved in the EMPC’s computers were prepared and presented in English, and my learners cannot read and write their mother tongue**” (line 157-158). This



indicates that literacy is an important factor for students' ability to transfer their learning in various schools ( compare paragraph 2.2.2)

One school manager also commented about the students' lack of confidence saying with disappointment that **“the training teacher usually shifts the responsibility to the teachers who used to type, those have not been trained at the EMPC”** (line 29). The school manager further indicated the way the teachers shifted the responsibility: **“if I insist that the training teachers should be given a chance to apply their skills, they will call the other teachers for assistance. At the end of the day you will find the other teachers trained in the other institutions doing typing for them”** (line 30-32). The school manager was surprised and disappointed that **“these other teachers will also type their personal letters”** (line 34). However, a school manager suggested one way of boosting teachers' confidence: **“teachers have to initiate and volunteer to type departmental documents that I have to submit to the circuit office as the school manager”** (line 85-86). Some of the students' community members put trust in them and created opportunities for them to apply their skills, but the students tended to disappoint them as well as indicated when **“my community members ask me to type them funeral and wedding programmes, but I cannot help them, for I am not competent in that”** (line 222-223).

On the other hand, some students had the confidence to apply the skills: **“I am fortunate to be the first teacher in my school to have computer skills, although I was not much competent, but I learnt a lot on my own”** (line 180-181). The student confidently indicated that **“teaching other teachers boosts my confidence in computers. I learn new skills that I never got from the EMPC each day, like changing the case from lower to capital and vice-versa”** (line 220-221). The creation of opportunities in application of her computer skills led her to comment: **“I am ready to learn from others too”** (line 223).

However some of the students are selfish and do apply their skills to help others: **“I have used my own money to travel to the EMPC to learn the course and my colleagues want to learn freely from me. If teachers want me to teach them computer skills, they need to compensate me. I just need them to compensate me for my time for teaching them the little bit of skills that I have”** (line 212-216). The findings reveal that students’ confidence affect their learning and ability to transfer.

#### **4.3.11 Students believed that the course empowered them**

Some of the students blamed the whole course for not empowering them enough, to enable them to apply the skills for teaching and learning: **“I do not understand how I can use computers in the classroom. The course has not empowered me to use computers to facilitate learning in the classroom”** (line 160-161). It was clear from the students’ responses that they were not empowered enough to apply the skills in their daily work: **“for an example, I attended one week RNCS workshop at the hotel, and I have left my classes without a teacher for a week. If I had the skills to prepare lessons with a computer and present them through a computer, my classes would go to the computer room and continue with lessons even if I am absent from duty”**(line 101-104). Another student who had computers at his school, further indicated the dilemma and frustration in which he found himself: **“I have the lessons neatly arranged in my file, but there was nobody to teach my learners when I am not in, but computers are there at our school. It worries me a lot when I still use a piece of chalk and chalkboard for teaching and learning** (line 105-107). Students emphasized the need to be empowered by the course for their application and lamented: **“I wish I was taught how to prepare a lesson and present it with a computer. If the course could empower us as teachers to use computers for teaching and learning, not just to type the lesson in a computer and print for filling”** (line 96-98).

It was evident that the course presenter did not teach the content in context, so that students would be able to apply the skills, as one student indicated plainly: **“I do not see any way in which I can use the computer skills in the school finances”** (line 147). One

would wonder the reason for the students not to see the relationship between *MS Excel* and finances. If students were well empowered, they would be able to apply their skills in finances as well. It is clear that the course presenter was not a good role model in applying the skills for teaching and learning, and that could have been a good explanation for them to say: **“I think I am not competent enough to help other educators to use computers for teaching and learning”** (line 209). One student further indicated his inability to apply skills: **“I do not use computer for teaching and learning, so I cannot help others with the skills I do not use”** (line 212). Furthermore, another student indicated the inability of the course to empower him and apply skills: **“yes, I do help other two teachers to learn few basic skills, but not for teaching and learning”** (line 217-218). Students indicated some ways in which the course would have made an impact for them to application in their profession: **“I like the way RNCS facilitators use slides prepared through a computer during RNCS workshops”** (line 118). Students went to an extent comparing the performance before the course and after, but could not notice any change: **“I still have to use a marker to prepare slides for my class, but I have computers at my school”** (line 120).

However, on the other hand, some of the students believed that the course had a positive impact as **“I learnt to create a folder. I am so happy that I can now correctly save my work”** (line 37). One student indicated the way in which he was empowered by the course to apply the skills in for his own use: **“I type my learning programme, work schedule and daily preparation”** (line 124) and to improve performance of their work: **“I type class lists for fundraising and mark lists. I type learners’ work sheets. I make flash cards and charts for my Learning Area and paste them on the wall”** (line 125-126). Another student indicated with excitement that the documentation of staff meetings minutes made it easy for the school to run the meetings professionally: **“I type SGB and staff meetings’ minutes”** (line 127) while another student commented on the impact the course had on her teaching methods: **“I use some of the teaching methods to teach some of the concepts. I have applied one simple way that I learnt from Shuma project for teaching graphs for the grade ones and I observed that my class have understood graphs better this year than the previous years.”** (line 129-130).

Management of the class was also aided by the skills: **“the Shuma project lessons that I retrieved from the computers in EMPC helped me in management of my class”** (line 134), as well as the amount of time she saved: **“I have saved lesson plans’ templates in the computer and I retrieve them simple anytime I need them”** (line 131-132). One student who taught in secondary school expressed her joy in the way the course had allowed her to develop as an educator: **“I am fortunate to be the first teacher in my school to have computer skills, although I was not much competent, but I learnt a lot on my own. My school received three computers from the Limpopo Department of Education for being fourth best in our grade 12 results in our district in April 2005, but were never used until I attended the course. My school manager asks to give me to type official letters, and this gave me an opportunity to be closer to the management team. My school manager has taken me to act as Head of Department and I do get an allowance for acting”** (line 179-185).

Many students expressed their appreciation for having the course which helped them in managing themselves and work professionally: **“my file is neat and well organized, because I typed my lesson preparations, work scheduled and learning programme and filed the papers neatly in my file”** (line 186-187). Another teacher added how much time he saved: **“I type question papers in advance instead of writing on the chalkboard. I am part of school management team, because I am the only one who types the official letters** (line 225-226). The student indicated the amount of time she had for her schoolwork: **“I designed file dividers for all grade 12 learners’ continuous assessment files”** and indicated with pride that **“we were the best in our Bohlabela district, and my school represented our district in Limpopo”** (line 191-192). The student further indicated with joy: **“we get CDs every year from the our provincial education department on career guidance, for different tertiary institutions and course offered, but we never used them for all those years, but for this year, I downloaded the information in the CDs for our grade learners”** (line 197-200).

Although some students have indicated the ways in which they were empowered by the course, and some explain how this has helped with various administrative tasks, it was not indicated how they apply their skills for teaching and learning.

#### **4.3.12 Students acknowledged the need for further studies in computer skills and applications**

It is evident that some of the young students acknowledged that they had acquired basic computer skills, but were now eager to register with other institutions for more advanced computer skills: **“I and some of my colleagues have registered with the Avuxeni Academy for more advanced computer skills”** (line 208). The student also indicated the reason to further her studies in computer skills: **“yes, I want to be professional in computers. I want a certificate that is SAQA approved”** (226). Another young student agreed, and said with enthusiasm: **“I want to move out of teaching career and look for green pastures elsewhere”** (line 226). The teacher further indicated his future plan: **“I am still young and I do not want to stay in this profession for years being a CS1 teacher”** (line 227). The need to learn more advanced skills was indicated by most students and acknowledged that the course had given them basic skills which empowered them to study further. Most students wanted to register with other institutions, so that they could learn skills that could help them prepare and present their lessons through a computer: **“yes, I want to learn more advanced skills”** (line 229). One school manager whose teacher applied computer skills at his school said: **“e--, I think the course is good for teachers. I do not have time as a school manager to attend the course** (line 84). However, the school manager further suggested an alternative to accommodate him, so that he could register for the course, after noticing changes in the performance of tasks by his teacher: **“if there were evening classes, I would register for the course** (line 87).

Conversely, some of the students did not want to register with other institutions and made some excuses: **“no, I can’t register with other institution, I am old enough to travel long distances. I have had enough with the distance from my school to the EMPC** (line 229-230). The student further indicated conditions that the EMPC had to meet for her to further her computer skills: **“I would rather register with the same institution,**

**the EMPC to further my studies as they promised that the certificates will be SAQA approved in the coming years, they are still busy with the University of Limpopo”** (line 233-234). It seems students think furthering their studies in ICT will help enable them to be more competent and transfer their learning.

#### **4.3.13 Students believed that their skills contributed towards learners’ learning.**

It is evident that the students’ learning contributed towards their own learners’ learning, as one secondary student indicated the way in which learners benefit from the application of the computer skills she learnt from the courses: **“learners are regard me as the helpful friend”** (line 201). She furthermore indicated the improvement of learning: **“when I compare the standard of learning with the previous years, I think more learning is taking place at my school because of what I have learnt in this course”** (line 202-203). **I download and print information from the encyclopedia for learners when they have their assignments in any learning area”** (line 200). It seems students’ technology skills benefited learners in various ways.

## **4.4 DISCUSSION**

### **4.4.1 Summary of the findings**

The purpose of this study was to investigate the ways in which teachers transfer learning between the basic computer course and their work environment. Transfer of learning is defined as “the ability to use learning gained in one situation to help one another” (Schwartz vol. 4:1447). However, previous studies indicated that a number of factors and conditions influence transfer of learning. This study supports most of the factors and conditions that influence transfer of learning, as well as previous research in the field.

The results obtained from observations and interviews indicate that some of the participants who had the support from their schools and course presenter have been empowered to transfer the computer skills for teaching and learning. Although some of

the specified outcomes were not achieved, the participants' confidence enabled them to use the skills for teaching and learning. Furthermore, most of the participants' comments indicate that some of the participants have not been empowered enough to be able to transfer the computer skills in their schools. Some do apply the computer skills for personal use, not for teaching and learning. They cannot apply the skills for personal use, such as typing their own CVs. I can conclude that there have not been demonstrable changes in the use of computers for teaching and learning. It can be assumed that the teachers have learnt touch typing skills, of which they did not consider it being important in their teaching profession.

They could not learn in context so that they could use the computers in the classroom situation for teaching and learning. There is little evidence linking the course to improved teaching and learning performance in various schools. It was emphasized by most students that the presenter concentrated too much on touch typing skills and did not cover all outcomes specified in the programme. The time for practice was inadequate and the form of assessment was inappropriate. It can be assumed that the participants had not been empowered enough by the course to be able to apply the skills for teaching and learning.

An extensive literature review on transfer of learning was done in order to provide a "framework for establishing the importance of the study as well as a benchmark for comparing the results of study with other findings" (Creswell, 2003:30). In this regard, some of the nine barriers to transfer as ranked by Phillips and Broad formed the basis for the analysis and interpretation of the results. Reference was made to support, reinforcement, learning in context and participants' confidence as being necessary to the transfer of skills from the course to the participants' schools.

The research question, which the study aims to answer, is: to determine how do teachers transfer learning between a basic computer course and their teaching practice? The results of the study clearly indicate that presenter's style, course content, support from management and peers, time for practice, learning in context, students' confidence,

nature and scope of assessment, accessibility to resources and conditions under which students transfer skills, have great impact in the transfer of learning for by participants as reflected in their responses (Appendix B)

#### **4.4.2 Validity/credibility/reliability of the findings**

In qualitative research, validity as the strength is used to verify the findings, as a strength of this study. Validity can be described as a way of determining whether the findings are accurate from the standpoint of the researcher and participant (Creswell, 2002:196). However, Creswell (2002:195) contends that validity and generalizability is limited in qualitative research. However for this study, some of Creswell's (2002: 196) strategies were employed to check the accuracy of the findings

- Triangulation: Evidence from teachers' and school managers' responses interviews, observations and examination results were used to build coherent justification for the themes
- Member-checking: The themes were taken back to the teachers to determine whether they feel that they are accurate. Teachers confirmed that the themes were accurate.
- Clarification of the bias: Open and honest narrative was created that I hope will make sense to the readers.
- Presentation of negative or discrepant information: Contradictory responses from teachers and school managers were discussed.

#### **4.4.3 Generalizability of the findings**

The results of this study cannot be generalized, for the study is typified as a case study. The number of students used as a sample for this study does not represent the whole population, hence the results cannot be generalized (Leedy & Ormrod, 2005:99). The sample of students that I used for this study were all Blacks, that is, they shared same culture, had the same educational opportunities, to such an extent that my study is restricted to people with set of characteristics, hence they were not a representative



sample, therefore, my results could not be generalised. Furthermore, this study is a qualitative research which takes place in the natural setting (Creswell, 2002:181). Similarly, Bell (2003:11) also confirms that this study cannot be generalized since, I was a single researcher who gathered all the information, which makes it difficult to cross-check information and information might be distorted. However, Denscombe cited by Bell (2003:11) disagrees and contends that findings of the case study can be generalizable if the case study example is similar to others of its type. However for this study, I have replaced, the concept generalisability by transferability (Heaton 2004:100). Bassey cited by Bell uses the term relatability instead of generalisability, which means the extent to which the details are sufficient and appropriate for a researcher working on a similar situation to relate to his or her decision making to that described in the case study (2003:12). Therefore the findings of this study are not intended for generalisability, but can be related in similar situations (Bassey cited by Bell, 2003:12)

#### **4.5 SUMMARY**

The chapter was used to report on data analysis and the findings of the study. The report started with students' performance in the examination. This was done in order to provide the evidence that all teachers were assessed for the course. The researcher's observations, teachers' and school managers' responses were discussed to provide the reader with evidence of the students' ways of transferring their learning to their various schools. Discussion of the results was used to provide the validity, or credibility of the findings, but the results cannot be generalized, because the students used for this study were not a representative sample of the population.

## CHAPTER 5: SUMMARY AND DISCUSSION OF THE FINDINGS

### 5.1 SUMMARY OF THE STUDY

The purpose of the study was to determine the way in which teachers who attended basic computer course transfer learning from the course to their schools.

The study started by establishing the meaning of ICT and how it impacts our lives and the need for teachers to develop ICT skills. The context within which the study is located was described in order to provide the reader with a full understanding of the natural setting, wherein the study would be undertaken.

The current debate provided the background and the reasons for undertaking the study. It is indicated that the transformation in education is critical which requires teachers to be computer literate. The draft white paper on e-Education (2003: [Online]), clearly states the need for integration of computers in the classroom. ICT training programmes are expected to produce computer literate teachers, so that they can transfer their skills to their various schools. This led to the formulation of the research question, which was stated as, " **how do teachers transfer learning from the computer course practice setting?**

A literature study on the importance of ICT skills for educators was undertaken in order to clarify the nature, scope and manifestation of the focus group areas in question, namely, how teachers transfer learning from the computer course to practice setting. It was established that the information age people live in requires them to have ICT skills. Many authors confirmed the need for teachers to have ICT skills, wherein Hodge and Miller contend that "*information and communication technologies are rapidly changing the way individuals live, firms do business, governments administer and nations interact*" (compare 2.2 paragraph 1). Furthermore, one of the South African Education Department's critical outcomes states that learners must be able to "*collect, analyze, organize and critically evaluate information.*" (Compare 2.2 paragraph 1). The dire need

for educators to have ICT skills so that they transfer these skills to their learners as indicated can be realized “*in the world increasingly dependent upon technology-whether at home or in the workplace- it is important that computers are made part of everyday teaching.*”(compare 2.2 paragraph 4). It was established that teachers’ ICT programmes take place, and little is known as to how teachers transfer these ICT skills to their workplaces. Transfer of learning was explained to form the basis of this study. It was established that certain factors and conditions affect the transfer of ICT skills.

Chapter three described the research as a case study, therefore case study approach strategy was employed. The role of the literature review was provided. Furthermore, the research strategy was described as qualitative approach. The chapter further identified data collection methods relevant for this study. Data analysis techniques and collected data verification techniques was portrayed in this chapter.

Chapter 4 contained data analysis and reported on the findings of the studying this order: the results of the teachers’ performance in the examination, teachers’ experience of the computer skills course and their ability to transfer skills in their schools, wherein these themes were identified, the course presenter’s style affected the learning during the course, belief that the course content was inappropriate for teachers’ application, dissatisfaction with the extent to which their learning was monitored and the way of giving feedback, management and peer support was considered an important factor for students’ learning, the context in which students had to transfer their skills was not conducive for transfer, the nature and scope of assessment were not appropriate and supportive for learning in context, students lack of confidence affected their ability to acquire computer skills, belief that the course empowered them, acknowledgement for the need for further studies in computer skills and applications and consideration that their skills’ contributed towards learners’ learning, followed by discussion of the findings. The relationship between the research question and the findings was established and reported as: *The research question which the study aims to answer is: **how do teachers transfer learning from the computer course to practice setting?*** The results of the study clearly indicate that transfer of computer skills is influenced by

presenter's style, course content, the way students' learning was monitored and feedback given, management and peer support, learning in context, students' confidence as reflected in the identified themes (see paragraph 4.3).

## 5.2 CONCLUSION

In the first chapter, the research question was posed as, **how do teachers transfer learning between a basic computer course and their teaching practice?**

The literature study established teachers need to have ICT and have to transfer the skills in their school (compare 2.3 paragraph 4). It was also established that reaction, learning, behavior and results can be used as the four levels of evaluating transfer of learning (compare 2.4.3 paragraph.11). Furthermore, certain factors and conditions that enhance or inhibit the transfer of computer skills were established and ranked from highest to lowest (compare 2.4.3 paragraph 1 and 2.4.4 paragraph 1).

However it was established that the concept "transfer is" a complex phenomenon. It was established from the literature that there are different levels of transfer of learning (compare 2.4.3 paragraph 7). It is established that research has proven that *transfer of learning is limited to near transfer, evidence for far transfer is generally lacking* (compare 2.4.3 paragraph 6)

Factors that influence the transfer of learning were discussed, but no single factor can be considered being capable of positively affecting transfer in isolation (compare 2.4.3 paragraph 1 and 2.4.4 paragraph 1). It was established that all factors play a role in positively affecting transfer (compare 2.4.3 paragraph 5). The study therefore, investigated the ways in which teachers transfer the computer skills from the EMPC to their various schools. Participants and researcher encountered problems during training, example, contextual problems such as the closure of the centre after winter holidays, due the presenter's responsibility of running the trial examinations. However, in the face of this problem, participants were willing to continue to learn and write the examination

It can be concluded that the aim of the study was achieved, **to determine the ways in which teachers transfer learning between a basic computer course and their teaching practice.** This conclusion is drawn from the qualitative data collected and participants' actual performance as analyzed

### **5.3 LIMITATIONS OF THE STUDY**

This study present offers several important findings, yet there are some limitations to the study as well. Firstly, the long distance that teachers traveled from schools to the EMPC might have contributed to teachers' learning and ability to transfer. The fact that teachers were from work and still had to concentrate cannot be ignored.

Secondly, the vast difference in the responses between the group and individual interviews. The use of the video camera in focus group interview, might have led them to respond differently, than individual interview when no camera was used. This brings up the problem of how reliable the responses are.

Thirdly, students work environments were not considered, but they differed significantly. It was indicated that some students do not have computers and some do not have access to computers, while others have. Fourthly, the fact that students knew that their certificates would not be accredited might have impacted negatively for their learning and their ability to transfer.

Another limitation to this study is generalizability of my findings. The results of the study are not generalizable to the larger population, as the number of representation of students was small, as it was stated in the research in chapter three (see paragraph 3.7). However, the results are related to other studies done by others. I feel this study would have made significant contribution if the results were generalizable, but nonetheless the relatability of this study is more important than its generalizability (Bell cites Bassey 2000:12).

The final limitation of this study is the use of self-report data only. Leedy and Ormrod contend that, “self-report data may be fraught with problems derived from memory restrictions and perception differences”.

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

The following recommendations for further research were formulated as a result of the limitations evolving from this study and also from the literature review:

- Research on different levels of transfer should be undertaken in order to identify the factors that influence transfer in each level.
- Furthermore, research should be conducted to determine the kind of transfer one is investigating. *“Beard has indicated that much of the research on computer skills and transfer has failed to identify the kind of transfer that was under investigation (Beard, 1993: [Online]).*
- Further research should be conducted on the type of learning in order to transfer it, as contended by Donald, *“it is easier to notice changes in performance of tasks when the learning is more skill oriented and thus more observable than when it is knowledge oriented” (Donald quoted by Schwartz, 1987: 380).*
- Further research should be conducted on how to achieve transfer of learning in ICT programmes, instead of concentrating on the how learning is not transferred.

#### **5.5 FINAL WORD**

ICT skills are needed in the information age we live in. Teachers have the responsibility to teach the learners in such a way that the learners can be able to collect, analyze and critically evaluate information by using technology. The ICT programmes empower teachers to be technological competent, so that they can integrate computers in their classroom for teaching and learning. The effectiveness or ineffectiveness of the ICT programmes can be realised by the way in which teachers transfer the skills acquired in

the programmes to their various schools. It is against this background that the study was undertaken. The participants in this study attended a basic computer course, but transfer their skills negatively in their various schools. Management and peer support, presenter presentation style, learning in context, the form of assessment and the form of feed factors and conditions influence the teachers to transfer their skills in their schools.



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## APPENDICES

### APPENDIX A

#### RESULTS FROM OBSERVATIONS

As I collected and analyzed data from preliminary observations, I found issues to explore. Questions arose that created a need for further observing or interviewing. I observed these:

1. The Natural Sciences teacher used typed flash cards in the introduction of her
2. lesson then stuck them on the chalkboard. At the end of her lesson she handed
3. typed worksheets based on the work she presented on that day, for the learners to
4. complete. In one school I also witnessed one Human and Social Sciences grade 5
5. teacher who gave his learners typed question papers for a test. The teacher read
6. out all questions and translated them in the learners' mother tongue. One
7. secondary school teacher printed encyclopedia's information and handed them
8. out to the learners. The very same grade 12 gave out materials on tertiary
9. institutions and courses offered by these institutions. The teacher then explained
10. the importance of the information. I witnessed one lady teacher teaching grade
11. four learners the mouse skills. The learners were grouped in threes in each
12. computer. The teacher used the learners' mother tongue to explain the correct
13. way of holding the mouse and left click. The learners had to change turns in
14. practicing the skill. Some of the learners were fighting, because their friends
15. would not give them chance to hold the mouse. The fighting learners were
16. stopped from practicing mouse skill. The teacher called them to sit in front of the
17. class and two learners were told to use their computer. One period of forty
18. minutes went over, while the teacher was trying to teach them the mouse skill. In
19. the secondary school, the teacher had used Wordart to type tables of content and
20. sub-headings as file dividers for her grade 12 learners' files. Her grade 12
21. learners' files looked very neat. In her class the class time table, learners names,

22. class policy, cleaning timetable and charts are neatly typed and pasted on the  
23. wall. I also observed in one primary school, one student wanted to use a  
24. computer, but failed to get access to the computer. The student was a Foundation  
25. Phase teacher, and she knocked in the school manager office. The teacher was  
26. told that a school management team meeting was going on inside the office. She  
27. asked one of her peers in the staff room to notify her when the office would be  
28. free. Her class had hand written charts and flash cards pasted on the walls



## APPENDIX B: RESPONSES FROM THE INTERVIEW (TEACHERS)

1. No, I did not have any computer skills before I started the course. All I could  
2. do in a computer was to switch the on button. I was so scared to touch any key  
3. in the keyboard, thinking that I might break it. I did not have computer skills,  
4. but I had typing skills that I had learnt in typing with a typewriter, in high  
5. school. **I remember the day I switched off the computer's power button**  
6. **after use, my colleague was very angry with me, saying that I had not**  
7. **switched off the computer properly. I thought that my colleague was**  
8. **trying to make fun of me. I became angry too, and I stopped helping my**  
9. **colleague in fast typing. I stopped using a computer from that day until I**  
10. **registered for this course.** I registered for the course so that I can become  
11. **independent when I have to use a computer.** I had no computer skills  
12. before, that is why I was not allowed to attend the Intel Teach to the Future,  
13. Facilitator's course last year in 2005. Three of us were turned back home,  
14. because the facilitator's course needed those teachers with basic computer  
15. skills. I was so angry with myself, that I wished I had attended the computer  
16. course in the EMPC some years back, but I was so ignorant. The EMPC has  
17. been there for years 21 offering the computer skills course, but I did not have  
18. any interest until I got a wake up call from Intel Teach to the Future. I never  
19. used the computer skills before the course. **I used to ask one of my**  
20. **colleagues** who learnt the computer skills in one institution, not the EMPC to  
21. type class lists and my personal documents such as CV and application letters.  
22. One of my colleagues had to put on the computer for me and I applied the  
23. typing skills to type the SGB invitation letters and minutes faster. **The sad**  
24. **part was that my colleague had to sit by my side to click, save, print the**  
25. **documents and shut down the computer. I felt so stupid because of the**  
26. **difference in pressure applied in a keyboard and a typewriter. I used to**  
27. **press hard on keyboard keys and that resulted in my documents having**  
28. **lot of mistakes. My colleague had to check the spelling.** I typed staff  
29. meetings' minutes. **I learnt how to put the computer on and shut it down,**

30. use of a mouse, touch typing skills, copying, cutting and pasting, how to  
31. change font type and size, drawing tables, retrieving stored information in  
32. a computer, classroom management strategies and methods of teaching  
33. some topics in some Learning Areas through computers and how to save.  
34. I can say we have done MS Word and Excel, but **concentrating too much on**  
35. **touch typing** skills. I learnt to start and shut down a computer. **I also learnt to**  
36. **retrieve stored information in a computer. I learnt touch typing skills and**  
37. **using the correct fingers for touch typing. I learnt to create a folder. I am**  
38. **so happy that I can now correctly save my work.** Our course presenter is  
39. always well prepared. Our presenter is very much **patient with some of us**  
40. **who do not put the correct fingers in the home row. She moves around**  
41. **and puts our fingers in the correct keys for the home row.** The course  
42. presenter is **knowledgeable about the touch typing skills.** Yes, **but not fully**  
43. **supportive.** The learning materials have very **brief notes, they are not**  
44. **detailed.** For instance, **I did not get the detailed steps on saving my work**  
45. **correctly.** I once wrote a practical practice task, but failed to save my work.  
46. Some of the photocopied handouts are invisible. The notes are written  
47. according to OBE approach, they also have the Outcomes, **but most of the**  
48. **specified outcomes not met. In a way, I can say they partially supported**  
49. **my learning. The notes were very brief.** Our presenter handed us some few  
50. notes, but **she seldom referred to them.** For instance, in the notes they will  
51. they tell me to maximize or minimize the screen, but do not show the  
52. maximize icon. **It was not easy for me to work on my own using the notes**  
53. **only.** I needed my presenter or someone to tell where to click when I want to  
54. maximize my screen. In a way, especially with saving my work in my  
55. documents, floppy disk or flash drive. I am able to name my file accordingly.  
56. At first I thought a computer saves automatically. I am not satisfied with her  
57. presentation styles, because **the presenter took too much time concentrating**  
58. **on the slow ones.** The teachers who coped so well in the course had to **move**  
59. **in the same pace with slow ones.** Some became bored, especially the young  
60. teachers. Some bored teachers were helpful to others. I do not like the way she

61. presents the touch typing skills. **She takes most time moving around trying**  
62. **to put each an every teacher's fingers in the home row.** The presenter used  
63. summative assessment . We have written one formal test, based on theory and  
64. practical work. **She used to give us some tasks (small projects)based on the**  
65. **work covered on that day to do in the class. We never submitted the tasks**  
66. **for assessment for. Our presenter moved around and ask" Have you**  
67. **finished, if not come on Thursday to finish."** I did not attend on Thursday  
68. **for she was not going to mark it and it wasn't for assessment. The**  
69. **feedback that I got from the task was not helpful, because it was not**  
70. **detailed.** She would comment about some of us who did not finish the class  
71. practice tasks I do not think **my presenter was monitoring my progress.** The  
72. **excel and Word, in short Microsoft Office. I would like have more**  
73. **practice time.** I think interim tests should be written. **The course should be**  
74. **done in one full year. Few days should be should be used for holidays and**  
75. **the most days be for the attendance of the course.** The holidays are best  
76. days for me as a teacher, since I wont have to worry about learners. I think the  
77. presenter need to be substituted during trial examinations. For instance, in July  
78. after the re-opening of schools, **we could not attend the course, because our**  
79. **presenter was busy with the grades' twelve trial examinations.** We  
80. resumed our course on the second week of August. The EMPC should be  
81. brought closer to people. There are some redundant buildings that can be used  
82. as the EMPC, for an example the Science Centre building. Before the training  
83. commences, **the presenter should at least ask us about our expectations**  
84. **from the course.** Our expectations should be considered in the design of the  
85. programme. That is to say, that teachers as trainees should be consulted in the  
86. design of the programme. **We are the trainees who are going to use the**  
87. **skills we learnt in our schools. I wonder if the designers really know the**  
88. **computer skills relevant in our schools. Enough time should be allocated**  
89. **for practical work.** The trainer should not do anything for the trainees, but  
90. should explain in such a way that **the trainee can do or perform the skill on**  
91. **his/her own. Touch typing should not should not be priortised. Our**

92. **course presenter should consider the fact that we teachers, are not**  
93. **administrators or secretaries.** I think our presenter **should mark all the**  
94. **tasks she gives us in order to monitor our progress. The marked tasks**  
95. **should have more detailed feedback than making oral comments only. I**  
96. **wish I was taught how to prepare a lesson and present it with a computer.**  
97. If the course could empower us as teachers to **use computers for teaching**  
98. **and learning, not just to type the lesson in a computer and print for**  
99. **filling. I think preparing a lesson and presenting it through a computer,**  
100. **can help a lot during teachers' absenteeism.** For an example, I attended  
101. one week RNCS workshop at the hotel, and I have left my classes without a  
102. teacher for a week. If I had the skills to prepare lessons with a computer and  
103. present them through a computer, my classes would go to the computer  
104. room on and continue with lessons even if I am absent from duty. **I have the**  
105. **lessons neatly arranged in my file, but there nobody to teach my**  
106. **learners when I am not in, but computers are there at our school. It**  
107. **worries me a lot when I still use a piece of chalk and chalkboard for**  
108. **teaching and learning.** I think the trainer should **apply continuous**  
109. **assessment for the course, not just one test. The class practice tasks**  
110. **should be marked and detailed helpful comments be given.** Thursdays  
111. should as well be taken as a compulsory attendance days for, not be taken to  
112. attended by those who have to finish up their practices. **Our presenter**  
113. **should give us more challenging tasks that could take us three days or a**  
114. **week to submit, as long related to our teaching professions. The tasks**  
115. **should be make me realise the way in which I can use the skills for**  
116. **teaching and learning in the classroom situation.** Example, I wish I was  
117. taught to **how prepare slides with a computer. I like the way RNCS**  
118. **facilitators use slides prepared through a computer during RNCS**  
119. **workshops. I still have to use a marker to prepare slides for my class,**  
120. **but I have computers at my school. The test should cover more skills**  
121. **that I can use in class.** For an example **I did well in the test, because I**  
122. **could bold, italise, underline, cut, copy and paste, use the font and size,**



123. **identify font type.** The certificate should be SAQA approved. I type my  
124. learning programme, work schedule and daily preparation. I type class lists  
125. for fundraising and mark lists. I type learners' work sheets. I make flash  
126. cards and charts for my Learning Area and paste them on the wall. I type  
127. SGB and staff meetings minutes. I use some of the teaching methods to  
128. teach some of the concepts. **I have applied one simple way that I learnt**  
129. **from Shuma project for teaching graphs for the grade ones and I**  
130. **observed that my class have understood graphs better this year than the**  
131. **previous years.** I have saved lesson plans' templates in the computer and I  
132. retrieve them simple when I need them. The Shuma project lessons that I  
133. retrieved from the computers in EMPC helped me in management of my  
134. class and new techniques of teaching some topics in the Learning Areas I  
135. teach. I do not use have access to computers at my school. I do not have  
136. computers in my class. There are two computers in the principal's office. I  
137. have limited access to computers at my school. **The computers are in the**  
138. **principal's office. Everytime when I use the computer in the principal's**  
139. **office, my colleagues make some bad remarks saying that I have taken**  
140. **the Deputy Principalship post.** The Deputy principal displays some  
141. attitudes towards me and she makes remarks such "**Why do you leave your**  
142. **class unattended and sit in the manager office?"**I do not feel  
143. **comfortable to work in the office. My colleagues would pass remarks**  
144. **such as: "You type very slowly"**. Take my case in our school, as a finance  
145. officer, I collect school fees from class teachers and issue them receipts. I  
146. make deposits to the bank. **I do not see any way in which I can use the**  
147. **computer skills in the school finances. Touch typing as the course**  
148. **content is not much relevant for my job as a teacher.** My school does not  
149. have enough computers for the learners. **My class is overcrowded and even**  
150. **if I can try to group them, it can take me two weeks to let each learn**  
151. **touch computer. My school does have computers, but I do not know**  
152. **what to use them for, whether to teach my learners touch typing**  
153. **skills of which I cannot do well. My school have computers too, but I do**

154. **not think my school I will ever use computer for our learners. Our**  
155. **learners cannot read and write, grade sevens as well. My school also**  
156. **have computers, but I do not know how to prepare lessons and present**  
157. **them with a computer.** All the lessons I retrieved in the EMPC's computers  
158. were prepared and presented in English, and my learners cannot read and  
159. write their mother tongue. **I do not understand how can I use computers**  
160. **in the classroom. The course has not empowered me to use computers to**  
161. **facilitate learning in the classroom. Enough time should be allocated for**  
162. **practical work.** The trainer should not do anything for the trainees, but  
163. should explain in such a way that the trainee can do on his/her own. **Touch**  
164. **typing should not be an emphasis in the course, but more advanced**  
165. **programmes should be done. School managers should create**  
166. **opportunities for trained teachers to apply their skills in our schools. I**  
167. **do not like it when our trainer keeps on showing me position of my**  
168. **fingers in the home row. I feel childish when she touch types for me, so**  
169. **that I can I can type as she does. I feel that I am too old to learn new**  
170. **skills, like touch typing. I am not interested in touch typing, all I need to**  
171. **know is, how to use a computer for personal use and in my classroom**  
172. **for my learners. don't think she needs to worry about my typing speed.**  
173. **I become frustrated when she stops me from using one finger to type for**  
174. **all keys. To me it makes no difference whether I use correct fingers or**  
175. **not, as long as I have typed the correct words. My colleagues pass bad**  
176. **remarks when I type question papers for my Learning Areas saying**  
177. **that my learners cannot read from a chalkboard and that I am making**  
178. **their reading problem worse by giving them as primary school learners**  
179. **question papers. I am fortunate to be the first teacher in my school to have**  
180. **computer skills, although I was not much competent, but I learnt a lot on**  
181. **my own. My school got three computers from the Limpopo Department**  
182. **of Education** for being fourth best in our grade 12 results in our district in  
183. April 2005, but were never used until I attended the course. **My school**  
184. **manager asks to give me to type official letters, and gave me an**

185. opportunity to closer to management. My school manager has taken me to  
186. act as Head of Department and I do get an allowance for acting. My file is  
187. neat and well organized, because I typed my lesson preparations, work  
188. scheduled and learning programme and filed the papers neatly in my file. **I**  
189. **type question papers in advance instead of writing on the chalkboard.** I  
190. am part of school management team, because I am the only one who types  
191. the official letters. I have designed file dividers for my learners' continuous  
192. assessment files were the best in our Bohlabela district, and my school  
193. represented our district in Limpopo. I always try to do the best in my work  
194. especially with typing departmental documents. We get CDs every year  
195. from the our provincial Education Department on career guidance, different  
196. tertiary institutions and course offered, but we never used them for all those  
197. years, but for this year, **I downloaded the information in the CDs for our**  
198. **grade** learners. I am lucky in our school because **I have a supportive**  
199. **manager.** He has bought encyclopedia's CDs and I download and print  
200. information from the encyclopedia for learners when they have their  
201. assignments in any learning area. Learners are regard me as the helpful  
202. friend. When I compare the standard of learning with the previous years, I  
203. think more learning is taking place at my school because of what I have  
204. learnt in this course. **During the course, I could not find any way in which**  
205. **my new knowledge could be used at my school.** No, I can't help other  
206. teachers because, **they used to make some bad remarks when I left my**  
207. **class early to attend the course.** My colleagues are not interested in  
208. learning. I and some of colleagues have registered with the Avuxeni  
209. Academy for more advanced computer skills. **I think I am not competent**  
210. **enough to help other educators to use computers for teaching and**  
211. **learning. I do not use computer for teaching and learning, so I cannot**  
212. **help others with the skills I do not use. I have used my own money to**  
213. **travel to the EMPC to learn the course and my colleagues want to learn**  
214. **freely from me. If teachers want me to teach them computer skills, they**  
215. **need to compensate me. I just need them to compensate me for my time**

216. **for teaching them the little bit of skills** that I have. Yes, I do help other  
217. two teachers to learn few basic skills, but **not for teaching and learning.** I  
218. am teaching one teacher who has bought a new computer some basic  
219. computer skills at her home. **Teaching other teachers boosts my**  
220. **confidence** in computers. **I learn new skills** that I never got from the EMPC  
221. each day, like changing the case of from lower to capital and vice-versa. My  
222. community members ask me to type them funeral and wedding programmes,  
223. but I cannot help them, for I am not competent in that. I am ready to learn  
224. from others too. I don't think teachers in my school **do want to learn,**  
225. **because they are old.** They have few years in the teaching field. Yes, I want  
226. to be professional in computers. I want a certificate that is SAQA approved.  
227. I want to move out of teaching career and look for green pastures elsewhere.  
228. I am still young and I do not want to stay in this profession for years being a  
229. CS1 teacher. Yes, I want to learn more advanced skills. **No, I can't register**  
230. **with other institution, I am old enough to travel long distances. I have**  
231. **had enough with the distance from my school to the EMPC. I would**  
232. **rather register with the same institution, the EMPC to further my**  
233. **studies as they promised that the certificates will be SAQA approved in**  
234. **the coming years, they are still busy with the university of Limpopo. I**  
235. **will further my studies with the EMPC, provided they cover all the**  
236. **learning outcomes as outlined in the handouts.** For an example, our  
237. presenter told us that it is very expensive for the centre to maintain Internet.  
238. Our presenter explained that we as trainees are supposed to pay more money  
239. if we want to use Internet. Besides paying more money, our program does  
240. not include Internet. **I thought I would be having my own e-mail address**  
241. **by now, but I don't have. I do not know how to send and receive an e-**  
242. **mail. I still have to go to the Internet Caf   to get information, and I am**  
243. **so worried that I still have to ask the Internet Caf   assistant to do**  
244. **everything for me.** I remember one day when I phoned my younger sister to  
245. who is doing her final year at the University of Venda to post me 2007  
246. application forms and brochure for my daughter. She told me that it was

247. going to be too long, instead she gave me the University's website address. I  
248. went to the Internet Café and I had to wait patiently for the assistant to  
249. download the form and the courses offered at UniVen. **I felt small, because**  
250. **very young people downloaded the information on their own.** I felt so  
251. embarrassed in March, when I had to organize an educators' tour to Maputo  
252. through phone and I could not use the Internet to search for accommodation.  
253. Our school telephone bill was too high. I had to phone and enquire about  
254. accommodation in different hotels. **Fortunately, one of my friends**  
255. **suggested that we could search through the Internet for best**  
256. **accommodation.** The Internet café assistant did everything for the school  
257. and the trip was successful. **I need enough time for practice than doing**  
258. **the theory work. To me knowing the definition of concepts is of no help,**  
259. **we should take most of our class time sitting on the computer. More**  
260. **time should be spent on keyboard keys** and how to use short cuts. **The**  
261. **examination was too easy. I had to reproduce the content of the course,**  
262. **without much reflection on the use of computers in the classroom.** The  
263. course content was too easy, but there **I did not learn the way in which I**  
264. **could apply the content to my everyday teaching,** except typing my  
265. learning programme, work schedule and lesson plans and printing them,  
266. then file them. **I could not relate in any way my application of course**  
267. **content in my class by observing my presenter.** I was so disappointed  
268. when I submitted my certificate to the Department for cash bonus, but only  
269. to learn that the certificates are not SAQA approved. Our presenter did tell  
270. that the centre was not accredited, but I wanted to be sure. **The**  
271. **assessment did not test our typing skills as such. I wondered why our**  
272. **course presenter took so much time in touch typing, but could not test**  
273. **us on them.** The examination was about one long document saved in a  
274. computer. We were told to open the document and answer questions based  
275. on the document. For an example, **I had to cut or copy paragraph x and**  
276. **paste it somewhere. I had to identify the font type or size for sentence y**  
277. **by selecting it.**

## APPENDIX C: Managers' Responses

1. Yes, I am aware that some of my teachers are attending the computer course at  
2. the EMPC. Yes, they consulted me before registering. Yes, **their attendance**  
3. **do disrupt classes**, for the teachers have to leave earlier before school goes  
4. out. The learners are attended to by the remaining teachers, but it is not  
5. easy. The remaining teachers have to leave their own classes unattended to  
6. keep order in those teachers classes. **Teachers do complain about these**  
7. **teachers. We have two computers donated by Wits University** and we are  
8. planning to buy computers for the school with allocated Norms and  
9. Standards funds. **Our school will have a computer room so that our.**  
10. **learners can be taught the computer skills by these trained teachers.** The  
11. trained teachers will **type all the official Departmental letters** instead of  
12. paying the private typists. **The teachers will type community's funeral and**  
13. **wedding programmes and in this way our school will be fundraising.**  
14. **Our learners will be moving in the right direction if they are equipped**  
15. **with the computer skills.** I expect the trained teachers to teach the  
16. **management team and other teachers the skills they have acquired at the**  
17. **EMPC.** I had a discussion with the teachers about their classes when they  
18. leave before school goes out. They indicated that they will organise with the  
19. remaining teachers to look after their classes. **It is difficult for the remaining**  
20. **teachers to look after their learners, especially the grade ones need full**  
21. **time attention. I do not worry a lot about the unattended learners, a long**  
22. **as the teachers are empowered in computer skills and our school will**  
23. **benefit from them.** Our school does not benefit a lot from the teachers who  
24. are attending the computer course at the EMPC. **The very same teachers who**  
25. **used to type the official letters are still the very same ones who do the**  
26. **job.** If I ask one of the teachers attending the computer course at the EMPC to  
27. type any document, **it takes him or her hours to type a small document and**  
28. **the document will have a lot of mistakes. The training teacher usually**  
29. **shifts the responsibility to the teachers who used to type, those have not**

30. **been trained at the EMPC.** If I insist that the training teachers should be  
31. given a chance to apply their skills, **they will call the other teachers for**  
32. **assistance. At the end of the day you will find the other teachers trained in**  
33. **the other institutions doing typing for them. These other teachers will also**  
34. **type their personal letters. I start to wonder as to what is that they are**  
35. **learning in the EMPC if they cannot type their own personal documents. I**  
36. **wonder whether they do attend the course everytime they leave their**  
37. **classes unattended.** When I ask about what they are learning at the EMPC,  
38. they will say that they learn about OBE through computers. They claim to  
39. learn about basic computer skills, but I have some doubts. **I have not noticed**  
40. **any change in the performance of tasks** by these teachers. **I do involve**  
41. **them in typing official documents, but they still depend on the other**  
42. **teachers for help. This disrupts classes, because the training teacher calls**  
43. **the other teacher to help him or with typing the document. When I**  
44. **visit their classes, I still see hand written flash cards pasted on the**  
45. **classroom walls.** I have one teacher who attended the course and **our school**  
46. **benefit a lot from her. She types official letters. At first she used to type**  
47. **the official documents with some mistakes, but I kept on encouraging**  
48. **her to take her time and retype and read it before printing. She used to be**  
49. **slow in typing, but her pace is improving day by day.** We have three  
50. computers from Limpopo Department of education that we received last year  
51. April, but they have been used for the first time by this EMPC course  
52. attendant. **This teacher's file is neat and presentable.** Her learners'  
53. **CASS files came first in the Bohlabela district** and this makes me proud.  
54. We used to get CDs for career from the Limpopo education department, and  
55. we never used, **but because of this teacher's skills, the CDs have valuable**  
56. **information for our grade 12 learners.** Of Course, I will not recommend  
57. more teachers to attend the very same course. I think **teachers are wasting**  
58. **their own money and time to attend the course. I realized that all**  
59. **the teachers who attend the computer course at the EMPC have**  
60. **registered with Avuxeni Computer Academy at our school.** Some of them



61. claim that they registered with other institutions, because their **EMPC**  
62. **certificates are not SAQA approved. They submitted their certificates to**  
63. **the Department for cash bonuses, but they were so much disappointed to**  
64. **learn that their certificates are not SAQA approved.** I think the EMPC  
65. course is ineffective in such a way that they cannot apply their skills at  
66. school, even for their personal use. Why would the very same teachers register  
67. for computer Diploma with Avuxeni Academy if the EMPC course  
68. was effective? The Avuxeni Academy will start classes start at the end of  
69. September. Most of the teachers have decided to stop attending at the EMPC  
70. and start attending the Avuxeni Academy course. More research should be  
71. done at the centre. The Education Department should conduct its own research  
72. on the transfer of computer skills learnt in the centre to various schools. I  
73. think the centre should be stopped from offering computer courses to  
74. educators. **I think school managers, trainees and trainers should be**  
75. **consulted in the design of the learning programme.** Certificates should not  
76. be considered as indicators for being competent in computer skills. The  
77. computer programme must train the school managers first, then teachers will  
78. trained later. The centre should make some reports based on the assessment of  
79. the programme itself, trainers, trainees from time to time. An external official  
80. must be appointed to do the assessment and the reports be sent to the  
81. Provincial Education Department. School managers whose teachers attend the  
82. course and teachers as well should be notified about the results of assessment.  
83. The main aim of the assessment is not fault finding, but to assist in the  
84. programme itself. E--, I think the course is good for teachers. **Teachers have**  
85. **to initiate and volunteer to type departmental documents I have to submit**  
86. **to the circuit office as the school manager** I do not have time as a school  
87. manager to attend the course. If there were evening classes, I would register  
88. for the course



## APPENDIX D: Teachers' interview questions

1. What computers skills did you possess before you commenced this course?
2. How did you use your computer skills in your work life?
3. What have you learnt in this course that was valuable for you as a teacher?
4. What do you like most about the course?
5. Did the learning materials in the course support your learning – elaborate?
6. Did you find that the presentation style of the course presenter contributed to your learning?
7. Is there anything you observed from the presenter that contributed to the way in which you can use computers in your lesson? elaborate
8. What form of assessment is used in your course?
9. How satisfied are you with the overall course?
10. Which of the skills that you have learnt can be used in you work situation?
11. What assists or prevents you from using computers for teaching and learning at your school?
12. Have you helped other teachers to also use computers for teaching and Learning?
13. Do you intend to register with any institution to further your studies in computer skills after this course?
14. What else should I know about your course in order to better understand the transfer of computer skills to your work?

## **APPENDIX E: Managers interview questions**

1. Are you aware that some of your staff members are attending computer course at the EMPC?
2. Does their attendance disrupt some lessons?
3. What are your expectations from the your teachers who attend the course?
4. In what way does the school benefit from the teachers who attend the computer course?
5. Have you noticed any change in the performance of tasks by these teachers? In what way?
6. Do you involve any of them in any activity that needs the application of computer skills? How?
7. Would you recommend more teachers from your school to attend the course? Why?
8. Is there anything you would to tell me about, in order to understand the transfer of computer skills by teachers who attend the course to their school?

## APPENDIX F: EXAMINATION

### MS Word Question Paper

Figure 7.1: INSTRUCTIONS FOR MS WORD QUESTION PAPER



Hox.pdf

#### MS Word document

Major players in the national and regional events are:

Department of Water Affairs and Forestry.

Nsinya for Africa .

Total South Africa.

The SA Nursery Association.

The National Botanical Institute.

Provincial Government Departments

national arbor week has become a major event for all South Africans

since its inception 17\* years

ago: "Plant a tree for life !!!"

The aim of Arbor Week is to promote better knowledge of, in

particular, indigenous nsinya,

highlight the vital role of nsinya in our lives by organizing a variety of greening events, especially

in the previously disadvantaged areas, and to stress the necessity for everyone, young and old,

to plant nsinya.



Arbor week is for you - plant, look after or sponser some nsinya to  
bring life and enjoyment to all

and contribute towards a healthier enviornment !

"onthou: plant 'n boom vandag, nie m\*re nie!"

national arbor week

Time to tree the country!!!

the tree

Forget not the froot that feeds man and beest,

The branch that bums to prepare the feast.

That sturdy frame that builds the home,

And the paper on which you read this poem.

The nsinya give all and ask no prize,

Even making the axe that ends its life.

Let us pause for the taking of inventory,

To measure the deb we owe the nsinya.

For the searching root that knits the soil,

The cooling shade for those who toil,

The airwe breath, nature's greatest gift,

And the leave that heralds eech seasonshift.

Table 7.2: MS EXCEL EXAMINATION 2006

**NAME:**

**COMPUTER NUMBER:**

EXCEL TEST		
INSTRUCTIONS	MARKS	
ALWAYS KEEP ROW ONE AND COLUMN A OPEN.		
1) A Open the file: <b>Final Exam (2006-1)</b> and save it in your folder' B Copy the file to a <b>New Sheet</b> and rename it: <b>Final schedule</b> C unhide the rows and columns that are missing and save' <b>(Keep working on Final Schedule)</b>	Possible	Achieved
	2	
	2	
	2	
2 <b>Move</b> the date to C3, and change the year to 1998	2	
	1	
3 <b>Insert</b> a column for <b>Med. of Instr</b> to the left of <b>Practice Teaching</b> The marks are <b>4%</b> more than those of Prac. Teaching'	2	
	1	
	1	
4.a <b>Merge and centre</b> heading number (1) from column B to R	4	
b <b>Change FINAL to FIRST YEAR</b>	1	
c Change the font to <b>Arial Black</b> , size <b>18</b> and <b>Bold</b> . (Adjust row height)	1	
d Colour Fill with <b>Sky Blue</b>	3	
	1	
5 a <b>Merge and centre</b> the date from column C to column Q		
b Change the font to <b>Impact</b> , size <b>16</b> and <b>Bold</b> .	1	

<p>c Colour Fill with <b>Pale Blue</b></p> <p>6 <b>Merge and centre</b> heading number (2) from column B to column R</p> <p>Change the font to <b>Lucida Gonsole, Italics</b>, size <b>16</b> and <b>Bold'</b></p> <p>Colour Fill with <b>Turquoise</b></p> <p>7 a <b>Merge and centre</b> students (from B to E) and subjects, (from F to P) change the font to <b>14</b> and <b>bold</b>. Colour Fill from <b>B to R</b> with <b>Aqua</b></p> <p>b <b>Bold and centre</b> all the headings from 86 to R</p> <p>8 Change the <b>font</b> of the ID Numbers to 9'</p>	<p>4</p> <p>1</p> <p>2</p> <p>3</p> <p>2</p> <p>1</p>	
<p>9 a Change the <b>column width</b> of all the marks (<b>FG to RG</b>) to 7 and <b>autofit</b> the other columns. (<b>BG to E43</b>)</p> <p>b <b>Wrap</b> text all the <b>subject</b> names in row 6 (F6 to R6)</p>	<p>2</p> <p>2</p>	
<p>10 Arrange the marksheet in <b>alphabetical order</b> from <b>C7 to P43</b> and <b>save'</b></p> <p>11 Find and delete the <b>row</b> with the candidate <b>Ngobeni, Josephine</b></p> <p>12 Insert a row for the candidate <b>Tryphina MBOWANE</b>, (in correct place) Use your <b>own ID Number</b> and calculate her marks with a formula. Her subject marks are all <b>5%</b> less than the candidate directly <b>above</b> her'</p> <p>13 Use the correct formula and <b>calculate</b> the <b>Totals</b> and <b>Averages</b> and <b>Bold</b></p> <p>14 <b>Fill</b> in the numbers of the candidates with fill, series and <b>centre</b> them.</p> <p>15 <b>Insert a picture</b> in the open space on top and resize to fit. <b>SAVE'</b></p>	<p>3</p> <p>2</p> <p>2</p> <p>3</p> <p>4</p> <p>3</p> <p>2</p>	
<p>16 Insert the <b>borders</b> as follows: First three Headings' <b>no borders'</b> Rest of marksheet (<b>from row 5</b>): Very Thick <b>outside</b>, very thin <b>inside'</b> <b>SAVE</b></p>	<p>4</p>	
<p>17 Set the <b>print area</b>, change the <b>page setup</b> to Landscape, no margins, one page wide, two pages tall' Save as PrintFile</p>	<p>4</p>	

18 Change the marks for <b>Medium of Instr.</b> to be out of <b>25 and not 100</b> The <b>new marks</b> must appear <b>to the right</b> of Average' <b>copy</b> and <b>bold'</b> Save the file as <b>New Marks</b> and go back to <b>PrintFile</b> and save it as Final Exam 2006-1 (RePlace, Yes)	3 2	
Insert a Data Filter in row 6 19 <b>Filter</b> out all the fail marks for English (<50) and make them <b>red,</b> Save as EngFail <b>and go back to All</b>	4 1	
20 <b>Filter</b> out the ten best averages, colour fill Pale Blue, save as Top Ten (Go back to All.)	5	
21 a <b>Filter</b> out the candidates who have <b>between</b> 70 and 80 for the average b Save the filter as <b>Almost Distinction</b>	6 1	
<b>Re-open</b> the file: <b>Final Exam I(2006-1)</b> 22 a <b>Arrange</b> the marksheet in <b>merit order</b> (descending), according to the <b>AVERAGES.</b> b Save the file as <b>Merit 2006</b>	4 1	
<b>Re-open</b> the file: <b>Final Exam (2006-1)</b> 23 a <b>Hide the column with the ID Numbers.</b> b <b>Freeze</b> the panes so that the <b>subjects</b> form the first row on top and the <b>surnames</b> form the first column on the left. c <b>Scroll</b> so that <b>Totals</b> are next to the <b>first names</b> and <b>SAVE</b>	1 2 2	
<b>Save</b> your file. Make sure that <b>all seven</b> saved files appear in your folder		
<b>Total Marks</b>	<b>100</b>	

