

**Secondary school learners' perceptions of the value of integrating  
ICT into the curriculum: An exploratory study in the  
Grahamstown Circuit**

A thesis submitted in partial fulfilment of the requirements for the degree of

Master of Education

Information Communication Technology in Education

of

Rhodes University

by

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December 2008

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## **Abstract**

According to the Draft White Paper on e-Education (DoE, 2003), the objective of ICTs in education is to build digital and information literacy so that all learners become confident and competent in using technology to contribute to an innovative and developing South African society. International researchers have acknowledged that little is known about learners' perceptions of their own learning, but that learners are aware of how technology can be used and have the potential to contribute ideas about ICTs can be used to support their learning. To add to this growing body of research, this study sought to establish secondary school learners' experiences and perceptions of the value of integrating ICT into the curriculum and the extent to which they believe that ICT is meaningfully integrated into the curriculum.

Although some of the schools do not have the necessary ICT infrastructure, this did not preclude the learners from having opinions about the potential benefits and drawbacks of ICT. The findings display the learners' perceptions on ICT use within the curriculum and how this relates to the available infrastructure in schools.

## Acknowledgements

- Firstly, I would like to thank God Almighty for blessing me with all the strength and wisdom to conduct this research. I know that with God nothing is impossible that is why I am where I am today.
- Secondly, to my supervisor Professor Cheryl-Anne Hodgkinson-Williams, I would like to thank you from the bottom of my heart. You have been there for me from the start and made sure that you let me take the baby steps until I could stand on my own. You believed in me and made me realise the potential that I thought I didn't have.
- Thirdly, the learners who participated in this study, without you this would not have been possible.
- Fourthly, to my colleague Ingrid, thank you for your assistance.
- Fifthly, my financial sponsors, the National Research Foundation (NRF) and the Department of Education (DoE), thank you for taking care of my financial needs.
- Lastly, to my family and friends, thank you for your encouraging words, support and understanding the worth of less time spent with you because of this research.

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## List of abbreviations

AAUW	- American Association of University Women
CAT	- Computer Applications Technology
DET	- Department of Education and Training
DoE	- Department of Education
FDET	- Former Department of Education and Training
FET	- Further Education and Training
FHOR	- Former House of Representatives
FMC	- Former Model-C
GET	- General Education and Training
HOA	- House of Assembly
HOR	- House of Representatives
ICDL	- International Computer Driving License
ICT	- Information and Communications Technology
IRC	- Internet Relay Chat
IS	- Independent Schools
IT	- Information Technology
MSN	- Micro-soft-Network
NEPAD	- New Partnership for Africa Development
NIED	- National Institute for Educational Development
OBE	- Outcomes Based Education
RNCS	- Revised National Curriculum Statement

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# Chapter 1: Background to the study

*Children are aware of aspects of the use of technology that we are not sensitive to  
and that we need to be told of*

*Scaife and Rogers (1999 cited in Levin & Wadmany 2006: 283)*

## 1.1 Introduction

Since the emergence of computers and subsequently the Internet, a worldwide revolution is taking place in the way we use information and communication technologies (ICTs) in society, including in education. With the so-called ‘information revolution’ and the wider availability of computers in schools the promise of educational benefits has increased (Hokanson & Hooper, 2000:537). While the education sector has been much slower to adopt ICTs compared to the world of business, there is a growing imperative from many governments, including the South African Department of Education (DoE), for providers of education to expose learners to the perceived benefits of using ICTs or what is also termed “electronic-Education” (DoE 2004:14).

The South African education system has developed from a teacher-centered approach to a more learner-centered approach (Spady & Schlebusch 1999) and all stakeholders affected are faced with all the challenges that this entails. This approach is referred to as Outcomes Based Education (OBE) and it involves a reorientation from a teacher-centered approach to a learner-centered and activity-based approach to learning (DoE 2002b:3). In relating ICTs to teaching and learning, the DoE maintains that:

ICTs can enhance educational reform by enabling teachers and learners to move away from traditional approaches to teaching and learning. In a transformed teaching and learning environment, there is a shift from teacher-centred, task-oriented, memory-based education (with technology at the periphery), to an exclusive and integrated practice where learners work collaboratively, develop shared practices, engage in meaningful contexts and develop creative thinking and problem-solving skills” (DoE 2004:16).

The Revised National Curriculum Statement (RNCS) reinforces the idea that there should be integration of ICTs into the curriculum. In addition, the RNCS supports the idea that learning through the use of ‘technology’ will equip learners with knowledge and skills to be competent and confident in accessing and working with various forms of information and data.

According to the White Paper on e-Education, the objective of ICTs is to build digital and information literacy skills so that all learners become confident and competent in using technology to contribute to an innovative and developing South African society (DoE, 2004:19). In support of the empowering capacity of ICTs in education, Tinio reflects that,

“Research has shown that the appropriate use of ICTs can catalyze the paradigmatic shift in both content and pedagogy that is at the heart of education reform in the 21<sup>st</sup> century. If designed and implemented properly, ICT-supported education can promote the acquisition of the knowledge and skills that will empower students for lifelong learning” (2002:9).

## **1.2 Problem statement**

Although this discussion focuses on OBE being learner-centred and how ICTs could support learning, learners’ opinions are absent. What do the learners have to say about the process of moving from teacher-centered to learner-centered approach? Learners have long been silenced in voicing their ideas on matters that involve them and their future. This has been a problem for policy makers and other parties involved in education policy development and implementation (Leask & Pachler 1999). They indicate that “for some time now, considerable claims have been made about the potential contribution of ICT to pupils’ learning by policy makers, researchers and some teachers (Leask & Pachler 1999:3) McLoughlin (1998 cited in Levin & Wadmany 2006) states that, “we know little about students’ perceptions of their own learning” (2006:283). Furthermore, Scaife and Rogers (1999 cited in Levin & Wadmany 2006) similarly argue that, “children are aware of aspects of the use of technology that we are not sensitive to and that we need to be told of” (2006:283). This study takes up the challenge of finding out what learners say about ICT and its contribution to their learning.

## **1.3 Research question**

The main goal of this research study is to establish learners’ experiences and perceptions of the value of integrating ICT into the curriculum and the extent to which they believe that ICT is meaningfully integrated into the curriculum. The research question is therefore: “What are the learners’ experiences and perceptions of the value of integrating ICT into the curriculum and the extent to which ICT is meaningfully integrated into the curriculum?”

## **1.4 Aim of the research study**

The major question that frames this study is to: Establish learners' experiences and perceptions of the value of integrating ICT into the curriculum and the extent to which they believe that ICT is meaningfully integrated into the curriculum.

In order to address the main question, the following subsidiary questions were posed

1. Have learners used a computer before?
2. What kind of access do the learners say they have to computers at home and at school or what kind of access would they like?
3. For how long do the learners say they have been using computers?
4. For what purpose do the learners use computers or, if they do not have access to computers yet, for what purpose would they like to use computers?
5. What kinds of computer programs do the learners use or would they like to use?
6. What are the learners' perceptions of the actual or potential benefits of integrating ICT in the curriculum?
7. What are the learners' perceptions of the actual or potential drawbacks of integrating ICT in the curriculum?

## **1.5 Previous research**

Studies in other countries have been conducted to ascertain the extent of ICT use in schools (e.g. Rodrigo 2003); however only a limited number of studies elicit the pupils' views (Deany, Ruthven & Hennessy (2003); Goodison (2002); Selwyn (2001); & Saye (1997)). McCallum, Hageaves and Gipps reflect that, "few studies have collected the views of young children on learning and it is suggested that the pupils' voice is an increasingly important element in furthering our understanding of teaching and learning more generally" (2000:275). In view of the limited attention paid to learners' views, this study endeavours to elicit the learners' voices. Learners were given a platform to explicitly air their views about the use of computers for their learning; what benefits they perceive and what obstacles they have identified.

## **1.6 Research orientation and approach**

The research has been conducted within an interpretive paradigm. According to Terre Blanche and Durrheim, “the interpretive paradigm involves taking people’s subjective experiences seriously as the essence of what is real for them (ontology), making sense of people’s experiences by interacting with them and listening carefully to what they tell us (epistemology), and making use of qualitative research techniques to collect and analyse information (methodology)” (1996:273-274). However this study used both qualitative (semi-structured focus group interviews) and quantitative (questionnaire) research techniques to collect data. Furthermore, Guba and Lincoln state that “both qualitative and quantitative methods may be used appropriately with any paradigm” (1994:105). Since there are limited previous studies that elicit learners’ “voices” I conducted an exploratory study (Mouton 1996:102).

## **1.7 Data collection methods**

Data was collected using two methodologies: questionnaires and semi-structured focus group interviews. After approaching the principals of all 13 secondary schools in Grahamstown ten questionnaires were taken to each of the schools with the request that ten learners, 2 learners from each grade 8-12, complete them. Twelve of the 13 schools returned completed questionnaires.

Focus group interviews were originally planned to include one learner from each grade 8-12 from each school. Unfortunately due to the learners’ activities the focus groups varied more than I planned, ranging from three to 10 learners in each focus group from each school (see Table 3.3). Their respective schools chose learners and most were interviewed on the school premises after school hours in order to avoid disrupting their school programme. I was entirely dependent on the goodwill of the school to make the learners available for this study and unfortunately had no control over their arrangements in response to my requests.

## **1.8 Limitations of the study**

The limitations of the study emanate from the number of schools that were involved in the project and the inconsistency of the number of respondents at each school. I believe if the

number of schools was fewer than five, I could have conducted more in-depth focus groups and elicited more extensive responses from a fewer number of respondents. Also, the issue of insufficient access to computers has restricted learners' experience of using computers resulting in limited answers to my questions. As the findings are based on a single set of interviews with a small sample of learners, the findings are not being representative of the rest of the learners in each school. However, the findings do show certain tendencies that could be followed up in further studies.

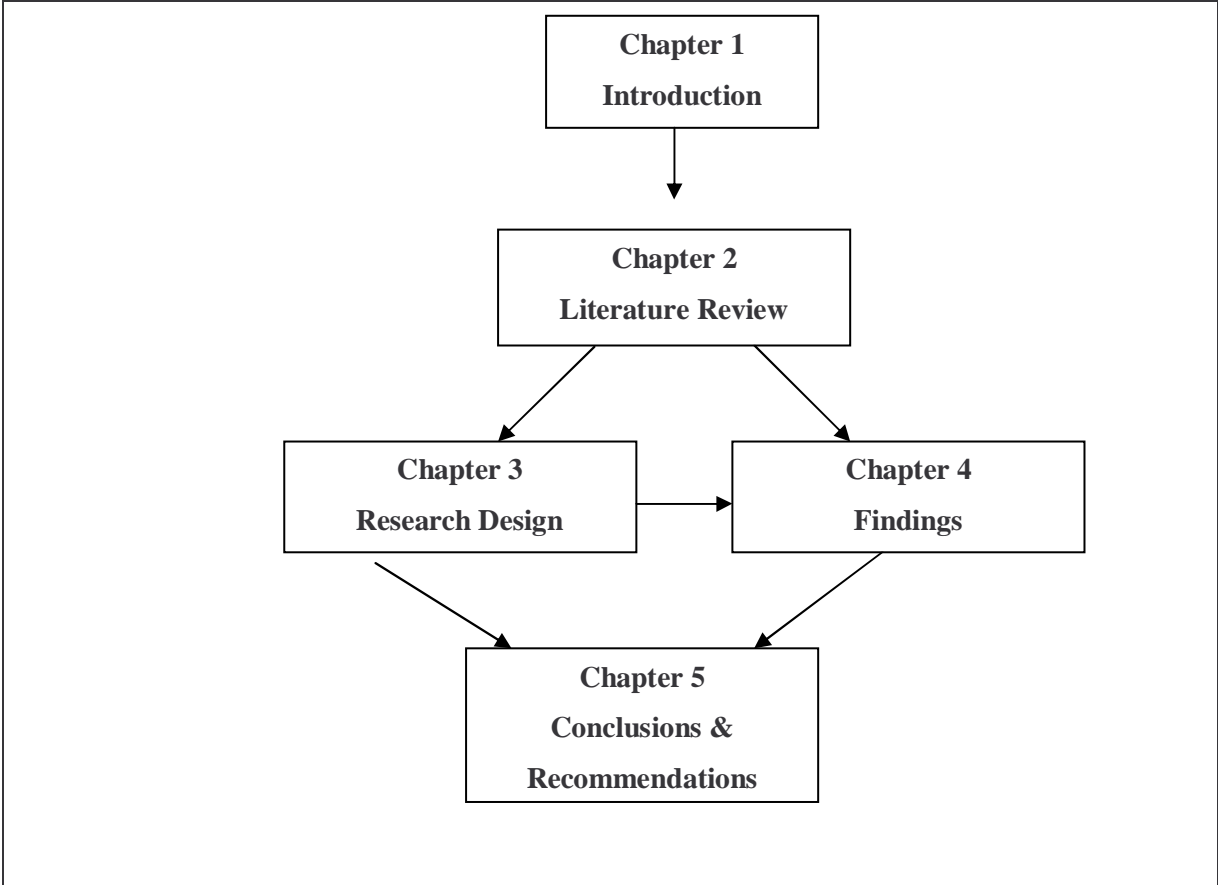
## **1.9 Potential value of research**

The national government has a policy in place as far as ICT in education is concerned; and for how teachers/educators are supposedly to integrate ICTs into the curriculum. However, this policy stops short of providing the actual implementation plans as these have been delegated to each province to devise. In the Eastern Cape an ICT in education policy was not yet publicly available at the time of the writing up of this study and therefore it has not been able to inform stakeholders at the provincial, the district level and school level. It is thus important, or in fact necessary, to know what the learners have to say as they are the ones who should benefit in the process of using ICTs in teaching and learning. The voices of the learners might also have an impact on the policy makers and to encourage them to step back and revisit some of the issues within the curriculum.

## 1.10 Outline of dissertation

This dissertation contains five chapters, of which an outline is shown in Figure 1.1. This figure illustrates how the chapters are related to each other and provides an overall conceptual map of the whole thesis.

- ❖ Chapter 1 provides the main purpose of the study and an overview of how the study has been conducted.
- ❖ Chapter 2 reviews the literature that is relevant to an investigation of the perceptions of learners in using ICT for learning. This chapter also reviews three key learning theories and how they help us understand how learners use ICT.
- ❖ Chapter 3 provides a description of the orientation of the study and a detailed discussion on the different ways in which data was captured.
- ❖ Chapter 4 explores, in depth, the findings of the study. The issues of prior use of computers, access to computers, duration of computer use, purpose of ICT use, software use, integration of ICT within the learning areas, benefits and drawbacks/disadvantages of using computers in the curriculum frame the discussion.
- ❖ Chapter 5 concludes the study, cites the limitations of the study and makes recommendations for policy makers.



**Figure 1.1 Outline of the dissertation**

## Chapter 2: Integrating ICT into the curriculum

*While quality and level of ICT resource continue to improve in many schools, provision of equipment alone is likely to be of limited value unless more is understood about the interactions and processes engendered by using technology in different settings, and how pedagogical strategies to enhance students' learning might be developed effectively through them*

*(Deany, Ruthven & Hennessy 2003:142)*

### 2.1 Introduction

The major purpose of this study is to try to understand how learners perceive the integration of ICT into the curriculum, in other words to try to elicit the “learners’ voices” on their perceptions of the use of computers for learning. This chapter investigates the reason for the use of ICTs in schools and the potential significance of the learners’ opinions of ICT in education for policy-making, research and practice. The chapter commences with a broad overview of what epistemic assumptions teachers hold and how they influence learners’ conceptions of knowledge and learning with ICTs. It then explores some of the theories underpinning ICTs in education and attempts to establish how successful the use of ICTs in education has been. It investigates the reasons why governments and schools are promoting the use of ICTs in schools and endeavors to identify exactly what policy-makers are expecting of the implementation of ICTs in schools. It concludes by scrutinizing some of the research that has involved learners’ input and suggests why learners can make a useful contribution to how ICTs can be used to the greatest advantage in supporting teaching and learning.

### 2.2 Why ICT in education?

Heemskerk, Brink, Volman and ten Dam’s (2005) statement: “In recent years, ICT has acquired a place in education, as it has in most other sectors of society” (2005:1) is congruent with what authors such as Stevenson, expressed about ICT in the education sector. Stevenson (as cited in Kennewell 2004:22) states that, “ICT permeates most other aspects of life from the supermarket and petrol station to the hospital operating theatre and aircraft autopilot and it

would be perverse to exclude it from education”. This statement is closely linked with the *Social Rationale* (Hawkrige 1990) where learners are expected to be aware of computers and how they can be used in modern society. The importance of this rationale is that the era in which we now live, is heavily technologically driven as electronic devices in homes, schools, hospitals and banks dominate society. The basis of this use of computers emanates from the concept of learning *about* (Jonassen 1996) computers. If learners know or have an idea of how computers work they might be able to respond to the challenges posed by new technologies. It is clear that computers are in fact part of our society and affect people in many aspects. Bialobrzeska and Cohen (2005) elucidate this view explaining that:

... computers are part of our daily lives. Each time a cashier scans a barcode in a shop, a customer uses an ATM to do her banking, or we query an account at the local council offices, a computer is involved. This is the case, too, when we use e-mail to exchange written messages and photographs with friends and family in distant places, or when we look for information, order books and buy airline tickets on the worldwide web (2005:12).

However, Stevenson maintains that, “the potential benefits of ICT have not influenced teaching and learning to the extent that might be expected from the influence of ICT in other walks of life” (as cited in Kennewell 2004:16). A possible way that ICT could influence teaching and learning is through its integration within the curriculum. The *Pedagogic Rationale* (Hawkrige 1990) elaborates upon this pedagogical aspect that focuses on the ‘integration’ of computers within the various school subjects: “... the potential of computers in helping children to learn” (Hawkrige 1990:3). This rationale might even suggest that computers can replace teachers as they are seen to be able to act as ‘tutors’ (Taylor 1980). However, research has shown that teachers are essential in the appropriate use of ICTs in the curriculum Abrami (2001).

While the pivotal role that teachers play is acknowledged, there is lack of professional development of in-service teachers. Simpson, Payne & Condie (2005) provide the following explanation:

ICT has been developed completely outside the educational system, consequently, all teachers are novices in the field of ICT use in classrooms and are therefore required to acquire new information and engage with learning, regardless of their previous professional expertise (2005:334).

It is for this reason that Carnoy (2004) states that,

it is a lack of training that creates difficulties; many teachers do not have the necessary IT skills and feel uncomfortable, nor do they have the specific training needed to be able to use new resources in the classroom (2004:1).

As far back as 1980 and as recently as 1995 authors such as Taylor (1980) and Schofield (1995) claimed that computers would influence the education domain. This is evident in a statement by Taylor (1980) where he states: “computers in education are revolutionary because they make possible great teaching in a system dedicated to mass education” (1980:113). Similarly, Walker (as cited in Schofield 1995:3) claimed that, “the potential of computers for improving education is greater than that of any prior invention, including books and writing”.

Hawkrige’s *Catalytic Rationale* is clearly focused on the hopes of improving teaching and learning. This rationale envisages that computers might promote change within the curriculum as well as in the styles of teaching and learning. Cloke and Sharif maintain a similar view as they cite one of Heppell’s (1993) stages of development termed “Pedagogical Change” which constitutes “ICT as an agent of change in both what is learnt and how it is learnt” (2001:11). The presence of computers, however, will be insufficient for pedagogic change. Dede explains that:

The important issue for the evolution of school curriculum is not the availability and affordability of sophisticated computers and telecommunications, but the ways these devices enable powerful learning situations that aid students in extracting meaning out of complexity (2000:299).

By contrast, Lawson and Comber believe that “new technologies may quicken education but they will not transform it” (2000:420). A deeper concern, raised by Lankshear, Peters and Knobel is that when it comes to ICTs, education may be compromised by those “who stand to gain out of ‘technologising’ education” (2000:21). As Selwyn and Fitz comment:

Successive British governments had supported the purchase of British IT equipment by educational organizations in order to sustain a fledging domestic computer manufacturing and software industry (2001:556-557).

It is therefore necessary to explore the perceived advantages and disadvantages of ICTs in education so as not to lose track of the importance of education per se. The inclusion of ICTs in education affects teachers, learners and the curriculum in different levels leading to different consequences. According to Lawson and Comber “teachers have to engage in pedagogical change through a greater awareness of the potential of the new technologies” (2000:426). Learners, on the other hand, are exposed to more collaborative and co-operative learning where they solve problems or carry out learning tasks as groups using a computer (Cloke & Sharif 2001).

According to the South African Department of Education (DoE), the objective of ICTs in education is to build digital and information literacy for all learners to become confident and competent in using technology (DoE, 2004). This statement is in line with Hawkrigde’s *Vocational Rationale* that is based on the rationale of children having knowledge about computer programming to lead them to use computer skills for future purposes. Hence, children get to choose subjects such as Information Technology (IT) so that they can pursue a career that is in line with that particular subject (DoE 2002a). It is for this reason that Watson maintains: “A common strategy has been the development of the ICT skills courses, which focuses attention and resource on the “vocational” rationale” (2001:255).

The purposes for which ICTs are used in education are to a large extent related to the underlying assumptions of knowledge or in other words the epistemological assumptions held by policy-makers and educators.

### ***2.2.1 Epistemological assumptions and ICT***

Williams explains that ‘epistemology’ is “the branch of philosophy that concerns itself with human knowledge, which is why it is also called ‘the theory of knowledge’” (2001:1). Epistemology might be more simply understood as what is conceived as valuable ‘knowledge’. Scheffler states that “knowledge is itself far from simple” (1965:1). He goes on to say that:

“the range of the everyday concept of knowing is very wide, including familiarity with things, places, persons, and subjects, competence in a variety of learned performances, ... and it is closely associated with notions of understanding ...” (Scheffler 1965:1-2).

Although there is no simple explanation when it comes to clarifying what ‘knowledge’ is, there are a range of questions that need to be addressed in order to have a more extensive view of what ‘knowledge’ is really about. These questions include ‘what is considered to be valuable knowledge’ and how do we come to claim to ‘own’ knowledge?

The way we think and how we do things is mainly influenced by what we believe or assume to know. It is then of importance to understand these epistemic beliefs that we bring to different situations. Our understanding of what knowledge is and how it is acquired plays an important role in how teachers and learners, for example, “behave” in the classroom. The manner in which teachers view knowledge and how it is acquired determines the teaching strategies they will use in the classroom situation (Dirkx, Kielbaso & Smith 2004). Similarly, Darkenwald and Merriam (1982 as cited in Kanuka & Anderson 1999) state that “one’s philosophical orientation will dictate how educators will view teaching, learning, [and] knowledge (1999:1). Brunner (1999 cited in Cloke and Sharif 2001) endorses this view by claiming that “all teachers have theories about how their students learn, which informs their approach to teaching” (2001: 10). Furthermore, Dirkx *et al.* maintain that, “the epistemic beliefs held by teachers ... are a significance influence on what students come to believe about the nature of knowledge and what it means to learn” (2004:3).

For example, the view of knowledge, according to Hinchey (1998), would be different for *positivists* and *constructivists*. Positivist epistemology relates to “knowledge as a *thing* [that is out there] waiting for us to find it” (Hinchey 1998:39) transmitted by an expert (teacher) who has the authority over the learner who is a receiver who has to merely reproduce the facts. Similarly, Dirkx *et al.* maintain that “knowledge is considered external to the learner ... residing in text ‘out there’ apart from the learners’ life contexts, to be discovered and imparted to the students by the teacher” (2004:7). On the other hand, constructivist epistemology “insists that knowledge is constructed by human beings when they assign meaning to data [and is] not simply sitting out in the world for us to find it” (Hinchey 1998:39&46). Dirkx *et al.* (2004) reiterate that teachers need to assist students in using what they already know to test and push the limits of their knowledge to explore and construct new ways of understanding problems.

If teaching in general is influenced by epistemological assumptions, then these will be the key to how teachers use ICTs. Kanuka and Anderson say that "... while one's working philosophy will not resolve problems educators encounter when integrating technologies, it can help in understanding and guiding decision making" (1999:1). It is therefore imperative to understand teachers' underlying epistemic assumptions especially when it comes to the use of technologies within the classroom situation. The assumptions that the teachers and the learners have about knowledge play a role in the teaching and learning within a technology rich environment (Dirkx *et al.* 2004). In the past, a positivist approach to knowledge was most common, where a teacher was perceived as an expert in a particular field, having more authority and control in the 'transmitting and receiving relationship' between the teacher and the learner. The question that we have to ask is whether it is still the same situation now that there is a rapid incorporation of Information and Communications Technologies (ICTs) into teaching and learning.

### ***2.2.2 Pedagogical assumptions and ICT***

Lai, Pratt and Trewern 2001 (cited in Lai & Pratt 2004) indicated that, "teachers' pedagogical beliefs regarding the value of the use of technology, and their attitudes toward technology in general affect their use of ICT" (2004:462). From a pedagogical perspective, according to Kanuka and Anderson (1999), instructionists believe that learning is 'systematic' and learners' understanding of the new information is expected to be the same for all learners. It is for this reason that Dirkx *et al.* maintain that "teachers perceive technology as a means for fostering the transfer of knowledge, rather than a means of constructing or producing knowledge" (2004:7). Similarly, Lankshear, Peters and Knobel (2000) claim that, "the Internet can seemingly be understood as an elaborate infrastructure for transmitting, receiving and manipulating information" (2000:18) if teachers hold 'instructionist' or 'transmissionist' pedagogical beliefs. These statements reveal that the integration of technology into teaching and learning may still maintain the same 'transmitting and receiving' kind of relationship between the teacher and the learner. The question is why knowledge is still viewed in a 'transmitting and receiving' kind of teacher-learner relationship? Dirkx *et al.* (2004) attempt to respond to the above question by reflecting that "asking teachers to integrate technology into their teaching and to stress constructivist aims for learning is asking them to deauthorize

themselves as knowledge experts and to authorize learners as potential producers of knowledge” (2004:12).

There is thus a tension around the issue of expecting teachers to uphold the role of a *constructivist* where they will use a learner-centred approach in the classroom. From a pedagogical perspective, the teacher’s role within the ‘constructivist’ approach is not to ‘act’ as a transmitter of knowledge but as a *facilitator*, whilst learners are given the opportunity to construct knowledge. My experience as a teacher has brought to my attention that teachers are aware of what is expected of them, *but* are not really putting it into practice. Solutions for trying to deal with this tension could involve government support of teachers’ professional development through activities that are based on constructivist principles and dialogue (Clarke 2001 as cited in Dirkx *et al.* 2004).

Having discussed the epistemic and pedagogical assumptions in relation to teaching and learning within the technological environment, it is useful to explore the learning theories that inform teaching and learning and the links with ICT.

## **2.3 What are the learning theories that underpin learning?**

The main concern of this study is centred on learners, how they learn and most importantly how they learn through ICT. It is for that reason that this section examines the three key learning theories and their relation to ICT. Teaching and learning have traditionally been based on the views of behaviourists, cognitivists and the constructivists and therefore the application of technology in teaching and learning is no different.

### ***2.3.1 Behaviourist theory underpinning ICT***

According to McInerney and McInerney, behaviourism can be understood as “a theory of learning that focuses on external events as the cause of changes in observable behaviour” (2002:126). The question then would be: Why does behaviourist theory still inform the use of ICT? Dillon claims that, “despite considerable changes in technology and ideas about how people interact and learn with it ... the information transmission approach to learning still has

a profound influence on ICT” (2004: 140). The role of the learners within the behaviourist environment is to be passive recipients of the information, which may lead to rote learning. On a more positive note, the patient drilling of the computer can allow each learner to learn at his/her own pace. It is clear that the behaviourist theory is only concerned with the behaviour of the learner. Borger and Seaborne (cited in Jarvis, Holford & Griffin 2003) claim that, behaviourists “focus on the measurable behavioural outcomes of learning rather than knowledge ...” (2003:25). I will emphasise three themes that emerge from the *behaviourist theory* on how teaching and learning occurs whilst using technologies as ‘delivery trucks’; teaching machines; and the representational use of computers.

### **2.3.1.1 Technologies as ‘delivery trucks’**

“Traditionally technologies have been used to teach students [and also] used to deliver and communicate messages to students” (Jonassen, Peck & Wilson 1999:2). The use of technologies in such manner is related to the “assumption that people learn *from* technology” (Jonassen et al. 1999:2). Likewise, Clarke (1983 cited in Jonassen, *et al.* 1999:11) implies that, “the role of technology was to deliver lessons that teach learners, just as trucks deliver groceries to supermarkets”. If technology is viewed as a ‘delivery’ device, it is then no different from a teacher with positivist assumptions who merely transmits “facts” to learners. Machines could better undertake the role of such transmission.

### **2.3.1.2 ‘Teaching machines’**

Pressy (1926 cited in Skinner 1965:427) indicated, that “a student learned something when told whether his answers are right or wrong and that a *self*-scoring machine could therefore teach”. Skinner (as cited in Ozman & Craver 1986) claimed that we live in a world where advanced technology can be used to improve human life if used in the right way and that “one of the most effective kinds of instruction may be done through the use of machines” (1986: 178). What is it then that the machines can do better in terms of permitting effective learning to take place? The teaching machines developed by Skinner seem to keep the learner busy by “presenting material”, asking questions, “presenting new material or remedial material depending on the response” and it is claimed by Skinner that “this role is performed better by

the machines” (Kennewell 2004:89). Skinner’s idea correlates with what Taylor (1980) referred to as using a computer as a ‘tutor’. When a computer is used as a ‘tutor’ it “presents some subject material, the student responds, the computer evaluates the response, and, from the results of the evaluation, determines what to present next” (1980:3). “According to the behaviourists, one of the advantages of machine learning is that learning takes place in small steps so that the student can avoid making mistakes” (Ozman & Craver 1986:179). It is also maintained by Skinner (cited in Thornburg 1989:41) that “educational computing ... would simplify the individualization of education by allowing each learner to proceed at his/her own rate”. It is therefore possible for learning to take place with ICT as it has been evident in computer-aided learning that was heavily based on the Skinnerian teaching machines (Kennewell 2004). It is therefore salutary to emphasise that the use of ICTs as simple “transmission machines” might encourage the regurgitation or re-presentation of exactly the same material.

### ***2.3.1.3 ‘Representational use of computers’***

Hokanson and Hooper (2000) introduced the concept of ‘representational’ use of computers and their statement explains that:

Media can be used in a representational manner to present instruction to help learners achieve existing educational goals more efficiently. It is this understanding that has been commonly used in educational technology, where media act in the delivery sense, doing what is prescribed, transmitting information (2000:548).

In other words the representational use of computers entails the re-presenting information, but mainly in another medium. As Stott aptly summarises: “Behaviourism is concerned with the external behaviour or what learners do, whilst the cognitive theory is concerned with the mental processes involved with learning, how learners acquire what they know” (2004:26).

### ***2.3.2 Cognitive theory underpinning ICT***

Cognitive theory is based on the activities that take place within an individual's mind and Dalgarno (2001) refers to this as the "learner's cognitive activity" (2001:184). Harré elaborates on cognitive theory by stating that:

"The cognitive psychology of Bruner and his colleagues was based on the principle that in order to complete an adequate explanation of the observable performances of thinking, remembering, deciding, classifying, perceiving, and so on, hypotheses about factual and procedural knowledge, and of cognitive structures and processes of which one was not currently aware, were required" (1966:25).

When learners use computers for their learning, they either use it as a 'representational' (Hokanson & Hooper 2000) tool "where ICTs are employed to merely re-produce information in another medium" (Hodgkinson-Williams 2006:15) or as a 'cognitive' tool (Jonassen & Reeves 1996) "where ICTs are harnessed to generate and develop ideas by individuals primarily" (Hodgkinson-Williams 2006:15).

#### ***2.3.2.1 ICT use as cognitive tools***

According to Salomon, Perkins and Globerson, "computer technologies can affect students' intellect [through] the kinds of programs and tools that can be used with this technology, as well as the kinds of activities that they afford" (1991:2). There are different understandings of what tools are and what they are capable of. According to Duffy and Cunningham, tools are "hammers, computers, televisions, cars" (1996:178). In other words, does this then mean that tools are concrete objects that can be handled and used? Bruner's theory on tools can help us understand this concept more clearly because he states that,

I know that the terms "tool" and "technology" and even "instrument" offend when one speaks of man as dependent upon them for the realization of his humanity. For these words denote "hardware", and it is mostly "software" that I have in *mind- skills that are tools* ([Italics added] Bruner 1966:25).

Bruner (1966:24) states that, "man's use of mind is dependent upon his ability to develop and use "tools" or "instruments" or "technologies" that make it possible for him to express and

amplify his powers”. It might then be correct to say that cognitive development can result from the use of tools that can strengthen the mind. Bruner explains that, “... tools amplify the powers of muscle, sense, and mind, and the more powerful the tools, the better the amplification” (1966: 88). In addition, Hokanson and Hooper state, “tools are used to achieve specific goals” (2000:548). Cognitive tools play such an important role in the learning process hence Jonassen (1994) states that, “cognitive tools are tools for helping learners to organize and represent what they know” (1994:4). Jonassen and Reeves’ (1996) conception is that cognitive tools enable learners to construct their own knowledge and that this process requires thinking. Hence the idea that, “computers may also function as cognitive technologies for amplifying and reorganizing the way that learners think” (Jonassen, 1994: 5). In conclusion, Jonassen and Reeves (1996:698) articulate a summary of the research findings on cognitive tools in the following principles:

- “Cognitive tools will have their greatest effectiveness when they are applied within constructivist learning environments.
- Cognitive tools empower learners to design their own representations of knowledge rather than absorbing knowledge representations preconceived by others.
- Cognitive tools can be used to support the deep reflective thinking that is necessary for meaningful learning.
- As a form of cognitive technology, cognitive tools have two kinds of important cognitive effects; those that are *with* the technology in terms of intellectual partnerships and those that are *of* the technology in terms of the cognitive residue that remains after the cognitive tools are used.
- Cognitive tools enable mindful, challenging learning, rather than the effortless learning promised but rarely realized by other instructional innovations.
- The source of the tasks or problems to which cognitive tools applied should be learners, guided by teachers and other resources in the learning environment.
- Ideally, tasks or problems for the application of cognitive tools should be situated in realistic contexts, with results that are personally meaningful for learners.”

Cognitive theory helps us in understanding the inner mental processes of learning whilst constructivism helps us understand how learners use these mental processes to construct knowledge within their environment.

### 2.3.3 Constructivism underpinning ICT

Kanuka and Anderson also describe constructivism “as a set of instructional strategies, as learning theories and as a way we come to understand ourselves and our environment” (1999:3). Although there are many forms of constructivism, they share two primary beliefs:

One is that learners actively construct their own knowledge rather than received preformed information transmitted by others. The other is that, in order to achieve this goal, curriculum emphases, classroom interactions, and classroom dynamics, must change in major ways (Green & Gredler 2002, citing Schlechty 1990).

The change within the education system from *traditional* teaching to Outcomes Based Education (OBE) in South Africa is reflected in the expected *styles* of teaching and learning within the *constructivist classroom*. Brooks and Brooks’ comparison of differences between “traditional” classroom and “constructivist” classroom (1993, 1999) cited by the DoE (2000:11-12) in their publication, “Curriculum 2005: Towards a Theoretical Framework” shows the teaching and learning process for both “classrooms” (Table 2.1)

<b>Traditional Classroom</b>	<b>Constructivist Classroom</b>
Learner primarily works alone. Passive	Learners primarily work in groups. Active
Knowledge is inert	Knowledge is active, situated in living worlds
Individuals are passive recipients of knowledge	Individuals construct knowledge with the help of others
Learning occurs with programmatic repeated activities	Meaningful learning is useful and retained, building on what the learner already knows
Teacher’s role is authoritative, directive	Teacher’s role is coach, mediator, strategic, co-learner
Curriculum is presented part to whole, with emphasis on basic skills	Curriculum is presented whole to part, with emphasis on the big concept
Strict adherence to a fixed curriculum is highly valued. Viewed as fixed entity	Curriculum is more flexible. Pursuit of learner questions is highly valued. Connectedness
Curricular activities rely heavily on textbooks and workbooks of data and manipulative materials	Curricular activities rely heavily on primary sources

Learners are viewed as “blank slates” onto which information is etched by the teacher	Learners are viewed as thinkers with emerging theories about the world
Teachers generally behave in a didactic manner, disseminating information to learners. Teacher-talk, learner absorbs	Teachers generally behave in an interactive manner mediating the environment for learners. Less teacher-talk, learner active
Teachers seek the correct answers to validate learner lessons	Teachers seek the learner’s point of view in order to understand learner learning for use in subsequent conceptions
Assessment of learner learning is viewed as separate from teaching and occurs almost entirely through testing	Assessment of learner learning is interwoven with teaching and occurs through teacher observation of learners at work and through exhibitions and portfolios

**Table 2.1 Comparison of the visible differences between “traditional” classroom and “constructivist” classrooms** (Adapted from DoE 2000:11-12, citing Brooks & Brooks 1993, 1999)

The similar pattern is followed when it comes to the purposes of using ICTs in education.

ICT is understood to have the potential to facilitate changes in education that would better prepare citizens for the Information Society [hence there is a distinction] between the ‘traditional’ teacher-dominant paradigm of education that was appropriate in the Industrial Age versus the ‘emerging’ paradigm, which emphasises active and interactive learners appropriate to the Information Society (Howie, Muller & Paterson, 2005: xiv).

There is a definition by Reigeluth (1995 cited by Stott 2004) of emerging features for ‘information age’ based education shown in Table 2.2.

<b>Industrial Age</b>	<b>Information Age</b>
Grade levels	Continuous progress
Covering the content	Attainment-based learning
Norm-referenced testing	Individual testing
No authentic assessment	Performance-based assessment
Group-based content delivery	Personal learning plans
Adversarial learning	Cooperative learning

Classrooms	Learning centres
Teacher as dispenser of knowledge	Teacher as coach or facilitator of learning
Memorisation of meaningless facts	Thinking, problem-solving and meaning making
Isolated reading, writing skills	Communication skills
Books as tools	Advanced technologies as tools

**Table 2.2 Emerging features for an information based educational systems based on changes in the workplace** (Reigeluth, 1995:89 cited in Stott 2004)

Similarly, Kennewell states “ICT supports a shift from an *instructive* mode to a *constructive* mode of classroom activity” (2004:24). There is a shift from the idea that ICT is merely for the conveyance of knowledge to the learner, to the idea that ICT can be used for doing tasks that enable them to think. This is maintained by Jonassen where he states that “technologies of instruction have traditionally been used as conveyers of information, communicators of knowledge, or tutors of students” (Jonassen 1994:1). Likewise, Scardamalia and Bereiter (1994 cited in Dillon 2004) state that, “emphasis in the design of computer based learning environments has shifted from information transmission to knowledge construction” (2004: 139). For the learners to move away from the ‘instructive’ mode they would really need to be “actively engaged in creation of knowledge that reflects their comprehension and conception of the information rather than focusing on the presentation of objective knowledge” (Jonassen 1994:3). This is the reason why Jonassen, Peck and Wilson (1999) emphasise learning ‘with’ technology than ‘from’ technology. When learners learn ‘with’ technology they then become ‘intellectual partners’. The concept of ‘learners as designers’ is put forward by Jonassen (1994) as the necessary strategy that would enable the learners to make sense of the learning content and how tools enable them to think as they are learning with them. Jonassen, Peck and Wilson (1999:153) state that, “the people who learn most from instructional materials are the people who design and produce them not the learners for whom the materials are intended”. It is therefore essential that, “we ... take the tools away from the instructional designers and give them to the learners, as tools for knowledge construction rather than media of conveyance and knowledge acquisition” Jonassen (1994:2). Hence, teachers should take on the role of a facilitator during the process of learning.

## 2.4 ICT use within the curriculum

The discussion at the beginning of the chapter implies that computers have been associated with teaching and learning for almost thirty years and yet the schools' curriculum treats it as something new to be used within the teaching and learning environment. Sutherland, Armstrong, Barnes, Brawn, Breeze, Gall, Matthewman, Olivero, Taylor, Triggs, Wishart and John also state that "there is a tendency to think that ICT is so 'new' that its use will be accompanied by 'new' pedagogies that will somehow transform teaching and learning" (2004:413). However, this does not necessarily happen as teaching and learning using technology affects the whole 'set up' of classroom activities. As Taylor, Casto and Walls point out:

There are more computers in schools than ever before, but learning with the assistance of technology will not occur automatically. Variables such as social context, instructional design, and pedagogical guidance by teachers can multiply the chances that useful learning will occur (2007:799).

Glennan and Melmed (1996 cited in Daniel 2005:71), claim that "Integrating technology is well thought-out type of school reform that is used to improve the learning of all students; schools are moving rapidly to integrate computers and the Internet into their curriculum".

There are varying understandings of what constitutes "integration" of ICTs into the curriculum. One assumption is that if learners can type out their work such as essays this equals the integration of technology. "Some authors describe ICT integration in a fairly self-evident, but unproblematic way" (Hodgkinson-Williams 2006:5). For example Flanagan and Jacobsen maintain that "Technology integration is meant to be cross-curricular rather than become a separate course or topic in itself" (2003: 124). Bialobrzeska and Cohen (2005) claim that there are three levels of integration, which include: *Functional practice*, *Integrative practice*, and *Transformational practice*. These levels of integration are based on how teaching and learning progresses from simple to abstract whilst using computers and each level is elucidated as follows:

- *Functional practice* which is referred to as the "first level" where "learners use the computer in basic and functional ways to do the things that the computer can do well –

such as word processing, document presentation, spreadsheets, producing graphs and searching for information on the Internet”

- *Integrative practice* is the level, where “the teacher begins integrating her purpose with the activities of the computer, and new ways of teaching and learning emerge”
- *Transformational practice* level is “characterised by learning, which occurs as a result of activities, and opportunities which do not exist in computer-less environments [allowing] possibilities for participation and response that might not exist in the face-to-face setting of the normal classroom” (Bialobrzeska & Cohen 2005:32-33).

In a slightly different manner, Downes (2001b cited in Blackmore, Hardcastle, Bamblett & Owens 2003:145) usefully differentiate between levels of integration of ICT into the classroom:

- Level 1: ICT skills are added into school program through a separate ICT subject, while teacher practices in subjects remain unchanged;
- Level 2: ICT skills are integrated into daily work of teachers, with some teachers’ pedagogical practices and classroom behaviours staying the same, while the practices of others change more radically;
- Level 3: ICT is transformative at the classroom level in that it changes content as well as pedagogy (what students learn as well as how they learn); and
- Level 4: ICT is transformative at the system level leading to changes in organisational and structural features of schooling.

The question now is what needs to be done to strengthen or elevate the level of integration of ICT to promote effective learning? Abrami states that, “To date, there is much promise but less substance . . . regarding the effective use of technology for learning” (2001:114). Taylor *et al.* (2007) concur with this sentiment and list what they refer to as key issues associated with the use of technology as including:

- (a) helping teachers learn how to integrate technology into the curriculum and their teaching (professional development);
- (b) gaining the support and encouragement of administrators;
- (c) emphasizing content and pedagogy, and not just hardware;
- (d) making learning a learner-centered process in which students question, manipulate, elaborate, organize, and monitor;

- (e) motivating positive cognition and self-efficacy through achievement of worthwhile outcomes;
- (f) using interactivity through multimedia and interactivity through collaborative learning to enhance personal and social construction of knowledge;
- (g) setting appropriate standards for formative and summative evaluation;
- (h) accommodating disability and respecting diversity; and
- (i) doing rigorous research (Taylor *et al.* 2007:799).

Having discussed the possible levels of integrating ICTs within the curriculum, it is necessary to investigate the policies of different countries in trying to understand and address the challenges that the education sector is facing when it comes to ICTs and education.

## **2.5 ICT policy in education**

The next section is based on the discussion of the different ICT policies in selected countries in Europe, Asia and Africa to provide a sense of the different policy developments in so-called developed and developing countries.

### ***2.5.1 ICT policy in Europe: the UK and the Netherlands***

The use of ICTs in education is to a large extent related to the assumptions that policy makers hold. Selwyn maintains that "... since the early 1980's many of the educational policies designed to bring the computer into the classroom have primarily succeeded in limiting its eventual effectiveness" (1999: 80). The question now is why these policies limited the possible effectiveness? Selwyn claims that "a succession of educational IT initiatives has forced computers on to schools in a haphazard and ill-considered manner, with little thought given to the practicalities of classroom use" (1999:80). Does the above statement then suggest that there is a gap between policy and practice? Cohen and Hill, (2001 cited in Owston 2007:63) indicate that:

although there is often a gap between national or state/provincial policies and the classroom practices they are meant to influence, practices are more likely to be affected when there is coherence between curriculum, assessment, instructional materials, and instructional guidance.

The introduction of computers into schools twenty years ago has since been the cause of how educational computing is today (Selwyn 1999). For the same reason, Barto 1996 (cited in Selwyn 1999) indicates that "... early initiatives were primarily hardware driven, with little thought given to how the computers were going to be used, once they had arrived in schools". The United Kingdom (UK) IT policy has since changed as the National Curriculum was introduced in 1988, "placing IT skills at the heart of the curriculum" (Dearing, 1993 cited in Selwyn 1999:80-81). The UK has since developed its policies and the recent one is:

reaffirmed through the Labour government's 'National Grid for Learning' [that is] aiming at connecting all schools, colleges and universities to the Internet by 2002 [as well as] developing the necessary ICT skills in both students and teachers [which are] necessary for learning in the 21<sup>st</sup> century (DfEE 1997b cited in Selwyn 1999:81).

The UK Prime Minister has made clear what the above statement entails by pledging that "by the year 2002 all 32,000 schools in Britain would have multimedia computers and Internet connections, and that all teachers would receive training to ensure that they were competent and confident to teach using ICT" (Dawes 1999:236).

In a similar manner, the Dutch government's ICT policy has been developed so as to "link ICT with the national curriculum and corresponding exam requirements; developing educational software and the optimal integration of ICT applications into the teaching materials ..." (Waller & Foster, 2000, cited in Mooij & Smeets 2001:266). In addition to the regular connection to the Internet, the Dutch schools also have the network called 'Kenninet' that is meant mainly for schools (van Merriënboer & Brand-Gruwel 2005). The main goal of the policies is specifically directed at solving the problems of the continuous lack of high-quality and affordable digital learning materials and difficulties with applying ICT for the improvement of teaching and learning process (van Merriënboer & Brand-Gruwel 2005).

### ***2.5.2 ICT policy in Asia: the Philippines***

Similarly, the Philippines' government and private sector have invested in ICT as tools that will transform the teaching and learning process (Rodrigo 2003). Consequently, both the government (Philippines' Department of Education, Culture, and Sport) and private sector contributed with up to a "P375 million" in planning to supply "75% of secondary schools

with multimedia-capable computer laboratories, training 75% of teachers in using the Internet and computer-aided instruction, and to integrate all learning areas of the curriculum with ICTs where appropriate by 2009” (Rodrigo 2003:96).

### ***2.5.3 ICT policy in Africa: Namibia***

African policies are not as pervasive as those in Europe or Asia. The Namibian Ministry of Education, through the National Institute for Educational Development (NIED), have developed a policy for ICT in education which has since been revised in 2000 (Namibia DoE). The goals of this particular policy reflect Namibia’s development agenda as they aim to:

1. Produce ICT literate citizens;
2. Produce people capable of working and participating in the new economies and societies arising from ICT and related developments;
3. Leverage ICT to assist and facilitate learning for the benefit of all learners and teachers across the curriculum;
4. Improve the efficiency of educational administration and management at every level from the classroom, school library, through the school and on to the sector as a whole;
5. Broaden access to quality educational services for learners at all levels of the education system; and to
6. Set specific criteria and targets to help classify and categorize the different development levels of using ICT in education (Republic of Namibia DoE: 2005).

The Namibian government has an interesting way of making sure that there is progress in the implementation of ICT in education as they have put in place a number of “desired levels” based on the following “development levels” (Table 2:3):

<b>Level</b>	<b>Description</b>
1	A small computer room is available. The computers are used for teaching ICT skills such as basic computer use, learning how to use a word processor, introduction to the internet and finding knowledge. One or two staff will have a minimum basic ICT Literacy qualification. <i>Students will spend about one hour a month using a computer.</i>
2	All level 1 attributes apply. In addition, all teaching and administrative staff should have reasonable access to a computer and are able to use the internet and e-mail, as well as word processor. <i>Students will spend about one hour every two weeks on the computer.</i>

3	Use of ICT underpins significant proportions of the work. All students have reasonable access to a computer (better than 1 computer per 10 students/learners), and all staff have access to a computer (better than 1 computer per 3 staff). <i>Students will spend about two hours a week using a computer.</i>
4	Use of ICT underpins much of the work. All students have reasonable access to a computer (better than 1 computer per 5 students/learners), and all staff have access to a computer (better than 1 computer per 1 member of staff). <i>Students/learners will spend over one hour a day using a computer.</i>
5	This is normally reserved for an educational facility with an ICT focus. ICT subjects such as programming, database design and usage, system configuration etc. will be taught. Students/learners will be obtaining employment in the ICT and related industries. <i>Students will spend at least four hours a day using a computer.</i>

**Table 2.3 Development levels** (Adapted from Republic of Namibia DoE).

The “desired levels” include:

- All pre-service teacher-training facilities should be at least level 4
- All schools with secondary grades should be at least level 2
- All primary schools should be at least level 3
- All libraries and Community Centres should be at least level 2, progressing to level 3 or 4 in the case of libraries used in secondary schools and tertiary education establishments.
- Any major section of an institute dedicated to computer studies should be level 5.
- All schools at level 2 or above must timetable in usage of the ICT in order to ensure all students/learners gain exposure to ICT, and the facilities are not left idle (Republic of Namibia DoE).

#### **2.5.4 ICT policy in South Africa**

The 1980’s period signified the introduction of South African schools to computers, which were then accessible mainly to private schools, and some well-resourced government schools. At first, the main use of computers was for administration, timetables, student records, [mark schedules] and school reports (Howie, Muller & Paterson, 2005).

While the education sector has been much slower to adopt ICTs compared to the world of business, there is a growing imperative for providers of education to expose learners to the perceived benefits of using ICTs or what the South African Department of Education termed “electronic-Education” (DoE 2004). The South African Department of Education (DoE) has responded to the pressures and challenges posed by the ‘information revolution’ by committing itself to the use of ICTs in education through increasing the requirements for using computers within the curriculum, as well as in specific computer-related subjects (DoE 2004). The Revised National Curriculum Statement (RNCS) (DoE, 2002b) has responded to the challenges posed by the technological pressures by introducing computers in the curriculum in at least four distinct ways. Firstly, for Grades R-9, computer use is embedded in the new learning area, Technology. Secondly, for Grades 10-12, there is Information Technology (IT), which involves the integration of theory and practice as well as structured experiential learning which affords a learner the opportunity to exercise computer skills and knowledge acquired at school and to provide an orientation to further studies in this field (DoE 2002a). Thirdly, for Grades 10-12, there is an alternative choice: Computer Applications Technology (CAT) for those wanting to use computers as a productivity tool (DoE 2002a). Finally there is a request to integrate computers in all grades within the various learning areas and subjects where possible.

According to the White Paper on e-Education (DoE, 2004), the objective of ICTs in education is to build digital and information literacy so that all learners become confident and competent in using technology to contribute to an innovative and developing South African society. It is therefore important for the government to take into consideration that for the objective to be achieved, there is a fundamental need to equip schools in each of the provinces with the relevant technology. Hence, the White Paper on e-Education clearly states that the success of electronic learning (e-learning) utterly depends on learners having regular access to reliable infrastructure (DoE 2004). It is for this reason that it is imperative that every teacher and learner in the General Education and Training (GET) and Further Education and Training (FET) phases has access to infrastructure that supports ICT (Eastern Cape DoE, 2002).

However, the current profile and distribution of ICTs in school is influenced by various factors in the different provinces. One of these could be due to financial constraints: “in terms of supplying all schools with equipment the government could be more proactive in this area” (Howie et al. 2005: XVIII). The levels at which ICT is integrated varies from one province to

the other, the Western Cape (Khanya); Gauteng (Gauteng Online) and Northern Cape (Connectivity Project) being the ones that are the most well resourced (DoE, 2004). Howie *et al* (2005) state that there are further challenges that the South African education system encounters due to the social pressures for the inclusion of ICT in education, which include:

The workplace increasingly requires employees who are scientifically, technologically and information literate;

- Educating so-called ‘knowledge employees’ requires an emphasis on problem-solving; access to information, evaluation, analysis and decision-making;
- Learners need a flexible approach to education;
- Learners need to update their knowledge; therefore knowing how to access information is critical;
- There are large disparities in abilities and ages of learners, requiring solutions to lifelong learning;
- There are financial pressures, as there is an increase in the number of learners and a decrease in funding; and
- There are not enough facilities (including classrooms) and there are substantial pressures on teacher: learner ratios (Howie *et al.* 2005:8).

The discussion of ICT policies in education leads me to the issue of who is involved in the implementation process. The stakeholders involved within a school setting include learners/students/pupils; hence it would be proper to elicit the learners’ views, as they are part of the teaching and learning process. Harper indicates that “in most cases, students voices continue to be ignored despite the fact that they make up more than 92% of schools, have probably 95% of the technology skills and are 100% of why the schools exist” (2005: 2).

## **2.6 The learners’ voices**

As I have noted at the beginning of the chapter that my main focus is to elicit the “learners’ voices”. At this point, my focus is on how learners’ views have been and still are relatively neglected (Morgan & Morris 1999:3). Similarly, Owston reiterates that, “Students are often

neglected in the school reform literature even though they are the entire reason why schools exist!” (2007:71). Likewise, Arksey and Knight (1999) also state that:

The opinions of children and adolescents have been neglected in some streams of social research on the grounds that children are not competent to understand and describe their world due to cognitive and linguistic immaturity (1999:115).

It is then necessary to take into consideration that, “children are key commentators on their own learning and authors of their own stories” (Smith, Duncan & Marshall 2005:486). Studies about different issues in teaching and learning including teachers’ perceptions on classroom practice have been conducted *but*, “the voice of the pupils is markedly less evident in research and publication, and the legitimacy of pupils to comment on their classroom experience on teaching, or on teachers, still has something of a shadow status” (Morgan & Morris 1999:2). It is for this reason that Smith, Duncan and Marshall indicate that “children’s perspectives are an important source of information about what engages them in learning and why” (2005:473). They further state that, “Even young children, however, are competent in understanding their experiences and are very capable of expressing themselves” (Smith, Duncan & Marshall, 2005:474). Similarly, McCallum, Hargreaves and Gipps (2000) reflect that: “few studies have collected the views of young children on learning and it is suggested that the pupils’ voice is an increasingly important element in furthering our understanding of teaching and learning more generally”. The need for ‘learners’ voices’ is in line with what the new curriculum (OBE) where learners are expected to be active participants in the learning activities. In support of this view, MacCullum *et al.* (2000) maintain that:

...understandings of learning are moving away from a traditional model with the learner as passive to more constructivist ones with the learner actively making sense and meaning of the information through interacting with it, so pupils are seen to have more of a role to play in their own learning (2000:275).

Consequently, the learners’ voices play an important role as such there is a need for acknowledging that their “... perspectives play an important part in framing the activity that takes place in school setting [including seeing them as] active participants in shaping social and educational processes rather than viewed as passive recipients ...” (Deaney, Ruthven, & Hennessy 2003:142).

A recent World Summit held at the Sandton Convention Centre in Sandton, Johannesburg, South Africa foregrounded the silenced voices of children in the media. One of the speakers (Disney 2007) expressed the sentiment that children are not adequately involved in the development and evaluation of television programmes for children. It is for this reason that in the African Charter on Children's Broadcasting there is consideration for the needs and wants of children where it is stated that, "children should be allowed to have a say in the initial stages of production of the programmes being produced for them" (Media & Children 5<sup>th</sup> World Summit 2007). Buckingham expresses a similar sentiment in relation to ICTs in education:

Much of this debate about children's uses of new communications technology has been conducted over the heads of the children themselves. We still know very little about how children perceive, interpret and use these new media ... Children are typically seen here as isolated individuals, who are powerless to resist the negative influences of the media upon them (1999:7 cited in Selwyn 2001:247).

It is clear that there is an extensive need for research that includes 'learners' voices' so as to counter statements, which suggest that, "It is uncommon for children's knowledge and understanding of their own learning to be used to improve teaching and learning" (Smith *et al.* 2005: 474). Instead, there should be statements that acknowledge that "there is growing recognition that children and young people have valuable contributions to make within their schools and communities" (Russell, Byrom & Robinson 2007:3).

## **2.7 Research on learners' perspectives of ICT integration**

Research that has been conducted concerning the learners' perspectives has mostly focused on Primary education and less has been done on Secondary education. Deany, Ruthven and Hennessy (2003) underscore this view and claim that: "few studies have focused specifically on secondary pupils' views on their current classroom use of ICT in teaching and learning" (2003:142). Goodison (2002) also investigated the pupils' perceptions, but at a primary level only. Warschauer, Knobel and Stone's (2004) study, elicits the learners' perspective to a certain extent, but is primarily about technology and equity in schooling and to a lesser extent on how technology was integrated into the curriculum in the schools.

The integration of ICT into the curriculum can benefit learners in two important ways such as valuable hands-on experience as well as a possibility for learners becoming creators of knowledge (Howie, Muller & Paterson, 2005). Hence the main focus of the study is about the learners' perceptions not of general issues, but more specifically on the integration of ICT into the curriculum. In the next section, I discuss the different studies particularly and highlight what learners perceived as of importance in using ICTs for their learning. In Deaney *et al.*'s study, learners' views have been summarised into six themes and these include:

- “Task affected”: which concerns how ICT tools enabled learners to carry out tasks with ease, quickly and reliably, and to high standard for example, fast typing, spell check and neatness
- “Refinement assisted”: which referred to the convenience of moving text and making the necessary changes when writing an essay using ICT
- “Ambience altered”: concerns the computer laboratory environment that is different and more relaxed than in the classroom and encourages more involvement than sitting in the classroom with pen and paper
- “Motivation changed”: deals with altered classroom ambience associated with ICT use raised interest and motivation
- “Learning reshaped”: deals more with the contribution of ICT use to reshaping learning, for example ICT resources had potential to be used not “as just a tool” but “as something to learn with”
- “Teaching displaced”: entails ICT use with a degree of distancing and displacement of teachers and teaching (Deaney *et al.* 2003).

Saye (1997) also conducted a study where students' perspectives were of importance. The findings generally suggest that students use technology for their learning as they indicated that “technology was used in virtually every class” (Saye, 1997:15). This is evident in Saye's (1997) summary of the students' perceptions on the different aspects of computer use in their learning and these include:

- Efficiency, speed, and clarity that educational technology provide students
- Technological affordances that give students more places to go for information than before
- Technological proficiency as preparation for the future world of college and work

- Derivation of students conceptions of technology use from how their teachers use technology
- Technological options that lighten the teachers workload which students perceive as laziness on the part of the teachers.

The next two studies are basically about the perception of learners of ICT within the primary school level and the findings are to a certain level contradictory to each other with respect to the use of word processing. Some of the learners cited in Goodison's (2002) study disagree that word processing allows them to type faster because of lack of typing skills as they put it "... sometimes you can't find the letters on the keyboard" (2002:290). Again, there seems to be "exchange of views" when it comes to which program to use when writing short stories as "one pupil thinks WORD is better ... and another who champions PUBLISHER" (Goodison, 2002:289). On the other hand, one of Selwyn's findings on the perceptions and views of primary school children in using computers includes "the speed and ease of work-processes when using computers" (Selwyn, 2001:245).

Coming back to the findings in Goodison's study, there is an indication that learners use computers at home and that this experience is somehow linked to what they are able to do at school as far as computer use is concerned. Goodison (2002) refers to this as "social learning" (2002:285), which implies that when learners use computers at home with family members, this gives them confidence to use computers at school in the presence of the teacher and other learners. Goodison further indicates that

The transfer of learning in ICT is two-way: from home to school and from school to home, and just as siblings (and parents) play an important role at home, so do classmates at school (2002: 286).

The learners have also indicated that the use of computer programs has elevated their independence (Goodison 2002:287). Selwyn (2001) has grouped the findings and these include:

- *the speed and ease of work-processes when using computers*: [using computers for school work rather than writing with hands using pen and paper] (Selwyn 2001:250).
- *the extending or curtailing of learners' abilities when using computers*: " for some children, the opportunity to produce work above and beyond their conventional capabilities prompted ... enthusiasm for using computers" (Selwyn 2001:253).

- *freedoms and restrictions of the finished product when using computers*: “... children argued with regard to writing stories [and] they considered the creative opportunities and constraints of the computer as very important” (Selwyn 2001:256).
- *concerns over originality and authenticity when using computers*: [There are concerns especially from girls that] “producing written work on a computer severely diminished the perceived right to be identified as the unique creative and individual source of the text” (Marshall 2000, cited in Selwyn 2001:258).

The research that I have discussed above seems to give an indication that learners have a lot to say in using computers for their learning. It is of concern that learners’ voices have been ignored for such a long time and yet the policies put in place are claimed to be for their benefit at the end of the day. Therefore, it is necessary when “further exploring how children are making sense of computers in school it may be possible to suggest ways of more effectively presenting computers to students in classroom settings through both policy and practice” (Selwyn 2001:260).

## **2.8 Opponents to ICTs in the classroom**

There has been hype about the use of computers especially in education. It is for this reason that some researchers have indicated the importance of integration of ICT in teaching and learning. However, Stoll (1999) is adamant that, “You certainly can get an excellent education without a computer. And schools don’t have a duty to provide Internet access. They have a duty to provide an education” (1999:32).

The question now is whether ICT is really a necessity for the betterment of teaching and learning. Similarly, Oppenheimer (2003:7) states that, it’s worth pausing a moment to ask an obvious question: “What does the record on school computing so far really show?” It is common knowledge that most schools worldwide have computers and access to the Internet especially those in developed countries. As a researcher from a developing country, it is important to unravel what impact technology has on the learners as computers are steadily becoming a major part of the education system. As a result of the dominance of computers in these countries’ schools, there are concerns expressed by authors such as Oppenheimer who states that:

“Our schools have now become institutions that foster what could be called a culture of the flickering mind. ... students’ attention span-one of the most important intellectual capacities anyone can possess shows numerous signs of diminishing” (Oppenheimer 2003:xx).

As the objective of ICTs in education is to build digital and information literacy, so that all learners become confident and competent in using technology to contribute to an innovative and developing South African society (DoE 2004), there are obviously concerns about the introduction of computers to the education sector. Bowers (2000) extends his concern to the cultural effects computers might have for societies, other than those who developed the computer technology. He implies that computers have benefits and drawbacks, positives and negative consequences that have to be taken into consideration. Consequently, Bowers is concerned that the use of computers for education undermines the cultures of those who did not create computers for education and claims that computers may “de-legitim[ize] the mythopoetic narratives of morally coherent cultures” (Bowers 2000:2). The concerns of ICT sceptics need to be taken into consideration; hence the next step is to investigate the state of ICT in developing countries and how these countries are affected.

## **2.9 Digital divide**

Selwyn (1997) and Hargreaves (1997 cited in Lewin, Mavers & Somekh 2003) “are among many who believe that technology is likely to increase disadvantage rather than ameliorating it, as a result of an increasing inequality of access, termed the “digital divide” (2003:28). For the same reason, Norris (2001 cited in Rodrigo 2005:53) defines the ‘gap’ as “the “digital divide” represent[ing] any and all technological disparities between groups of people”. Tinio shares the same sentiment as she indicates that:

Given the wide disparities in access to ICTs between rich and poor countries and between different groups within countries, there are serious concerns that the use of ICTs in education will widen existing divisions drawn along economic, social, cultural, geographic, and gender lines (2002:19).

To elaborate on these statements, people from different countries have some kind of access to technology, but it is to a certain extent visibly different from one country to the other for example, in developed and developing countries such as United Kingdom (UK) and South

Africa respectively. The level of the digital divide is referred to by Norris (2001 cited in Rodrigo 2005:53) as the “global divide” where there is divergence of ICT access between industrialised and developing countries (2005:53).

In the case of South Africa there is a digital divide within the country as schools from the previously disadvantaged (black) communities, formerly known as Department of Education and Training schools, certainly do not have equal access compared to the schools with mainly white learners, which were referred to as House of Assembly and Independent schools (Howie, Muller & Paterson 2005). The magic phrase is ‘access’ and therefore the priority should be to address that and try to investigate how it is linked with the ‘state’ of ICTs in developing countries. However, Roode, Speight, Pollock and Webber indicate that it is not only about providing access to ICTs, but also finding the “root” of the problem, which they refer to as “development” (2004:2). They proceed to highlight the different approaches which they refer to as *Technocentric approaches: where governmental, political and technological attempts focus on providing access to digital communication technologies* and *Sociocentric approaches: Where the focus is on people and their developmental needs* (Roode *et al.* 2004:2). According to them, it is the ‘combination’ of these two approaches that needs to be addressed and they refer to it as “socio-techno divide”. (Roode *et al.* 2004: 2) It is therefore imperative for “development” to be the main goal whenever access to ICTs is provided in trying to bridge the gap.

### ***ICT in developing countries***

“Computers have been in schools in western countries for a quarter of a century and there are now few, if any, countries in the world that do not have at least one computer in at least some schools” Cawthera (2002: 5). Since South Africa is one of the developing countries, I agree with the above statement, as it is the case with the schools within my study. Nevertheless, the vast majority of schools in the world [especially in developing countries] do not have any computers [and there is a high possibility that] substantial numbers, perhaps even the majority, of children have not seen and used a computer (Cawthera 2002). How do children then stand a chance in the ‘digital world’? It is for this reason that Hawkins indicates that the “the World Bank initiated the World Links program in response to developing countries’ demand for strategies to prepare their youth to compete in a world increasingly driven by

information, technology and knowledge” (2002:39). Similarly, “the New Partnership for Africa Development (NEPAD) e-school projects aim to equip secondary schools (and later primary schools) in Africa with information and communication technologies (ICTs) to enable educational transformation to meet the demands of the 21<sup>st</sup> Century” (Evoh 2007:2). The preparation of learners to compete in technology dominated world is closely associated with the integration of ICTs in teaching and learning and that warrants “support for teachers’ professional development” (Hawkins 2003:39). As a result of the lack of support for teachers, “most of the world’s teachers have yet to feel comfortable integrating their use into the curriculum ...” Hawkins (2003) further investigates the challenges that developing countries encounter in using ICTs and these include:

- the lack of adequate hardware and software as well as well as unreliable Internet access
- getting computers and keeping them working is a challenge
- poor telecommunication infrastructure
- lack of finances
- ministry of education’s inability in equipping schools without partnering with private sector
- the lack of a clear policy in ministries of education with regard to the use of computers in education
- professional development of teachers (Hawkins 2003:39-42).

## **2.10 Computer access at home and at school**

In general it is common knowledge that learners who have access to computers at home are more advantaged than those who only have access at school (Becker 2000). Although this statement could be challenged, I believe that it is not only access that is important, but also curiosity and willingness to learn using computers anywhere.

“Recent studies of children’s use of computers in the UK suggest that over 60% of children have access to home computers” (Hartley 2007:51). The question now is how these learners use computers at home and how that is linked with what they learn at school. Kennewell and Morgan (2006: 267) claim that “young people use ICT more at home than at school, however,

and there are distinct differences between their approaches to learning, and the resources available to them, at home and at school”. Research has revealed that most learners’ use of computers at home is for playing games and with limited educational purposes (Giacquinta, Bauer, & Levin, 1993; Downes 1999; Livingstone & Bovill 1999 & Hartley 2007). On the other hand, the time factor is what determines the activities that learners get busy with. Kerawalla and Crook (2002) state that “ children perceived more scope for exploration and ‘fiddling about’, compared to the rigid curriculum restraints guiding what happens in school and that time schedules imposed by school could often leave pieces of work unfinished” (2002:753). Furthermore, Murphy and Beggs (2003) reported that boys spent much more time than girls on the computer at home, although most of that time was playing games. Girls spent less time at home on the computer but used it more for homework” (Murphy & Beggs 2003: 79). “Other authors suggest that there are gender differences in how children use computers at home” (Hartley 2007:51). Since there is a connection between gender ICT, and games, it would be proper to investigate the link and the consequences of this combination. When it comes to ICT and games, it is necessary to include the aspect of gender as it plays a rather important role when it comes to teaching and learning. Likewise, (Facer 2006:8) concurs that, “it would be impossible to conclude a review of computer games and learning without highlighting the key issue of gender that inevitably arises”.

Computer games are linked with learning as they develop certain aspects in the players. Teachers Evaluating Educational Multimedia (TEEM) report cited in Facer (2003) reveals that, the outcomes of using games in the classroom and these include:

- **Skills-** this was seen as to be the key area in which games made a contribution to the curriculum, although these skills are not always recognized within the curriculum. Key skills identified were:
- **Communication and working with others-** children playing games were required to communicate with other children playing games, to describe what is taking place, to share resources, to make arguments and debate actions.
- **Problem solving-** the games provide a set of challenges that children must overcome in order to complete the game successfully.
- **Mathematical development (application of number) -** many simulations require budgeting decisions, encouraging financial capability. Further, many games environments require learners to ‘use everyday words to describe position’ (2003:5).

## **2.11 Gender, ICT and games**

The next section briefly reviews the role of gender in the use of ICT and also the effects of games on the use of ICT as well as exploring how the two concepts relate to teaching and learning.

### ***2.11.1 Gender and ICT***

When it comes to computers, it is common knowledge that ‘boys’ tend to dominate in terms of their interest in the technological aspect of computers whereas ‘girls’ tend to be concerned more with the context-driven aspects (Morgall 1993 cited in Murphy & Beggs 2003:81). Similarly, Scheckelhoff (2006) also states that “research continues to reveal that girls are not as attracted to or as skilled with computers as boys” (2006:52). The questions might be why do boys seem to have more interest in computers and more importantly what warrants girls to be less interested? Research has shown that it is about the pupils’ “difference in confidence in their own ICT skills” (Volman, van Eck, Heemskerk & Kuiper 2005:46). Volam *et al.* further indicate that, boys say “more often than girls that they like lessons in which computers are used and experience more control of the computer than girls” (Volman *et al.* 2005: 46). On the other hand, “girls respond more favourably to technology assignments that ask them to use real-world data and situations that need solutions” (Scheckelhoff 2006:55). It would appear that the girls’ interest in computer use is limited to certain activities. Volman *et al.*’s study revealed that girls were more interested in the Image and Global Teenager e-mail programs more than boys” (2005:47). This statement shows that girls are not as interested in being in control but in sharing or working with others and this is referred to as girls being engaged in more “co-operative than competitive programs” (American Association of University Women (AAUW) Educational Foundation, 2000; Fiore, 1999 cited in Volman *et al.* 2005:47). It is then important to make sure that girls are assisted in building more interest and courage to use computers hence Scheckelhoff indicates that, “to support [girls] ... teachers must continue to discuss strategies for engaging them in daily learning experiences that enable them to incorporate meaningful technology” (2006:1).

### 2.11.2 ICT and Games

Williamson and Facer (2004) indicate that “ from policy, industry and educational research perspectives ... the newfound interest and acceptance of computer games is focused primarily on exploiting the potential of games’ interface in schools and that the potential benefits of these interfaces to formal education are manifold” (2004:256). Williamson and Facer (2004) reveal that firstly, children play games in peer groups where they actually take on specific roles as teachers and learners of games-play and secondly, children play games to be regarded as the ‘experts’ of the game as “they invested substantial time, effort and resources in maintaining this status” (2004:260). Chou and Tsai also indicate that “most youth play games for entertainment, for seeking information, for filling time, for escaping the loneliness, for escaping from routines and people, and as a social device” (2007:813). The question is how these games affect learners and what links games have to learning. As far as games and learning is concerned, there are ‘elements’ that make these games more engaging as Mitchell and Savill-Smith (2004) claim. Table 2.4 shows the elements as:

<b>Characteristics of the computer game</b>	<b>How characteristics contribute to players’ engagement</b>
Fun	Enjoyment and pleasure
Play	Intense and passionate involvement
Rules	Structure
Goals	Motivation
Interaction	Doing (i.e. the activity)
Outcomes and feedback	Learning
Adaptive	Flow
Winning	Ego gratification
Conflict/competition/challenge and opposition	Adrenaline
Problem solving	Sparks creativity
Interaction	Social groups
Representation and a story	Emotion

**Table 2.4 The elements that make computer games engaging**

(Adapted by Attewell and Savill-Smith 2003 from Prensky 2001 cited in Mitchell & Savill-Smith 2004)

### ***2.11.3 Computer programs and software***

The use of computers is based on the kind of software that is available and this could also affect the manner that they are used either by teachers or learners in the school context. Similarly, Rodrigo reiterates, “the extent and nature of ICT use in schools is highly dependent on the types of software available to users” (2005:62). What role does educational software then play in teaching and learning? Squires and McDougall (1994) state that “the use of educational software is essentially concerned with three issues which include:

- a) How students’ learning can be improved by using software,
- b) How teachers use software to improve and extend their teaching, and
- c) How teachers and students interact in classrooms in which software is being used (1994:66).

It is for this reason that for each learning activity where computer software is used, there has to be a main goal that is underpinned by a learning theory. Hence, Squires and McDougall state that “a major concern in software selection is to identify the theory of learning underpinning the package, and to decide whether this theory is appropriate for the intended educational tasks (1994:87). They further highlight that there are many computer packages that support different views of learning such as “the acquisition of knowledge in the form of factual information; learning by discovery or by interaction with other students; an active process in which students build their own intellectual structures, refining and developing these with time as they encounter new experiences” (Squires & McDougall 1994:6). If these views of learning were catered for in terms of software it would then be important to ‘attach’ the necessary software with each view of learning. Rodrigo (2005) claims that there are three general categories of ICT use in education and he describes each category as follows:

ICTs as subject matter in themselves	ICTs as support tools for traditional educational practices	ICTs as transformative tools to support student-centered learning practices
<p>Students learn about ICTs</p> <p>ICTs are subject matter in themselves</p> <p>Courses that fall under this category typically include teaching word processing, electronic spreadsheets and presentation tools</p> <p>Students sometimes learn BASIC programming and are taught how to use a database system</p> <p>If Internet connectivity is available, students learn how to use Internet browsers and email</p>	<p>Students use tutorial, drill and practice exercises, and encyclopedias on CD ROM in line with their academic classes</p> <p>Make use of productivity tools and the Internet to complete academic requirements</p>	<p>Software and the Internet are used to engage the learners and enrich and broaden the learning experience</p> <p>Students use computer simulations, laboratory software, math software and similar products</p> <p>They use the Internet to gather and analyze data, to collaborate with distant peers, or to communicate results</p>

**Table 2.5 Categories of ICT use in education** (Adapted from Rodrigo 2005:62)

Having discussed the computer programs and how they are used within the teaching and learning situation, I would then like to highlight the use of the Internet, as it seems to be one of the most popular programs.

### ***2.11.3.1 Common purpose of Internet use***

The most ‘attractive’ aspect of ICT seems to be the Internet and is popular amongst children and adults. Wigley and Clarke, (2000 cited in Livingstone 2003:148) claim that: “recent surveys show that among 7–16-year-olds, 75 percent have used the Internet, a figure double the adult population figure of 38 percent”. How do children exactly utilize Internet? According to Livingstone: “... surveys chart children’s favourite websites, showing that children value this new medium for information, entertainment, relieving boredom and their

preferred activity, communication (chat, email, instant message)” (2003:149). The general use of Internet might be linked with how learners undertake their school projects. The British Market Research Bureau’s Youth Target Group Index (2001 cited in Livingstone 2003:149) showed that the most common uses are studying/homework (73%), email (59%), playing games (38%), chat sites (32%) and hobbies and interests (31%). Similarly, Somekh (cited in Brown & Davies 2004) implies that young people use the Internet for “researching and producing a word-and –image-processed text about it for homework, while chatting to friends using an IRC (Internet relay chat) system such as MSN messaging, listening to downloaded music ...” (2004:57). It is common knowledge that children enjoy using the Internet as they venture into “information seeking” (Bilal 2005). During the process of ‘information seeking’ children seem to develop affective states and Bilal (2005) align these with the following factors:

<b>Joy of using the Web</b>	Most children (87 percent) referred to ease of use over print sources, ability to search by keyword, learning about the topic searched, grandness of information on the Web, availability of graphics, convenience of access, and fun
<b>Frustration</b>	Frustration arose when children retrieved zero hits and when they did not find relevant information. Forty-three percent felt frustrated during the search process. Feeling frustrated was also expressed for slow download of Web sites, screen freezing, and confusing screen display
<b>Confusion</b>	The organization of the retrieved results (categories and sites within categories) was confusing to a few children [Bilal’s summary of the children’s views shows their confusion whilst using the Web]. These children state that they were confused when they don’t find the answer during the search
<b>Motivation</b>	The reasons for most children to be motivated to use the Web include: increase in self-confidence, challenge, discovery, and convenience
<b>Persistence and patience</b>	Children’s motivation in using [the Web] augmented their persistence and patience in locating the desired information. The children’s comments imply that if you keep trying you will eventually get the information you need using the Web

<b>Task preference</b>	When children choose their own topics, they develop interest and tend to be more motivated in seeking information (Gross, 1997 cited in Bilal 2005). [This is due to their] satisfaction with search results, ability to choose the topics and modify them during searching, and challenge in finding information about a topic of interest
<b>Source preference (for example, Internet vs. print sources) and search engine preference</b>	Children preferred search engines that are designed for adult users such as Google, AltaVista, Askjeeves, and Yahoo

**Table 2.6 Children's affective states** (adapted from Bilal 2005:200-203)

## **2.12 Summary**

This chapter has explored the broader aspect of using ICT in education; an overview of what epistemic assumptions teachers hold and how they influence learners' conceptions of knowledge and learning with ICTs; and some of the theories underpinning ICTs in education, specifically, the behaviourist, cognitive and constructivist. The learners' opinions are the main reason for this study and so the previous studies dealing with the same aspect were included in this chapter to try and strengthen the argument for the need for more studies that would elicit the learners' voices. In conclusion, the opponents of ICTs in the classroom; digital divide; ICT in developing countries; computers access at home and at school; gender; ICT and games; computer programs and software and common purpose of Internet use were among the issues that were investigated.

## Chapter 3: Research Design

*There is no single highway that leads us exclusively toward a better understanding of the unknown. Many highways can take us in that direction. They may traverse different terrain, but they all converge on the same destination: the enhancement of human knowledge*  
(Leedy & Ormrod: 2001:100)

### 3.1 Introduction

This chapter starts with an explanation of the research orientation that informs this study, and the research design adopted. It also reveals how the research questions, consisting of the main question with a number of subsidiary questions, relate to the key issues addressed in the study. The research environment and site, which is made up of 12 of the 13 secondary schools within the Grahamstown Circuit, and the participants are described. The research methods, tools and techniques used to collect all the data are discussed in detail. A discussion of the data analysis trustworthiness and ethical issues as well as the research activities conclude the chapter.

### 3.2 Research design

This study is informed by an interpretive paradigm or “lens” (Cohen, Manion & Morrison 2000:3) through which to examine research. According to Terre Blanche and Durrheim (1999:6) “paradigms are all-encompassing systems of interrelated practice and thinking that define for researchers the nature of their enquiry along three dimensions: ontology [which] specifies the nature of reality that is to be studied and what can be known about it; epistemology [which] specifies the nature of the relationship between the researcher (knower) and what can be known [and] methodology [that] specifies how researchers may go about practically studying whatever they believe can be known”. As Cohen, Manion and Morrison note the “central endeavour in the context of the interpretive paradigm is to understand the subjective world of the human experience” (2000: 22). In other words, the researcher undertakes to interpret what the participants share and what they perceive as ‘real’ about their

experiences. Bassey (1995:14) also explains that the purpose of interpretive research is to “describe and interpret the phenomena of the world in attempts to get shared meanings with others” For as Gray observes, “there is no direct, one-to-one relationship between ourselves (subjects) and the world (object)” (2004: 20). Instead there are many different interpretations of the world by the participants, who in this study are secondary school learners in the Grahamstown Circuit.

The interpretivist stance is particularly appropriate in this study as I endeavour to elicit the subjective perceptions of learners’ views on the use of ICTs in teaching and learning. Terre Blanche and Durrheim (1999) highlight that the characteristic of the interpretive approach is when

the researcher believes that the reality to be studied consists of people’s subjective experiences of the external world, she or he may adopt an intersubjective or interactional epistemological stance toward that reality and use methodologies, such as interviewing or participant observation, that rely on a subjective relationship between researcher and subject” (1999:7).

To elicit the learners’ subjective experiences, this exploratory study (Mouton 1996:103) has employed two methodologies namely questionnaires and semi-structured focus group interviews and developed an inductive understanding through the analysis of both the quantitative and qualitative data. Exploratory studies are applicable “in cases where very little previous research has been conducted” and endeavour “to gather new data and to determine whether there are interesting patterns can include both quantitative and qualitative data” (Mouton 1996:102). Dabbs (1982) as cited in Berg (1998:2) differentiates between qualitative and quantitative approaches [by] indicat[ing] that the notion of quality is essential to the nature of things [whilst] quantity is elementally an amount of something.

### **3.3 Aim of research**

In previous studies there seems to be limited attention paid to the secondary school learners’ perceptions of using computers to support their learning. Deany, Ruthven and Hennessy (2003) state that there are a limited number of studies that elicit the pupils’ views in general

and in particular the learners' views on the contribution of ICT to teaching and learning in the secondary school. They underscore that: "few studies have focused specifically on secondary pupils' views on their current classroom use of ICT in teaching and learning" (2003:142). In Chapter 2 I discussed in detail other studies that attempt to elicit the learners' 'voices'. The purpose of this study is to provide the learners a platform to voice their views about the use of computers for learning, what benefits they perceive and what obstacles they have identified. In so doing I aim to ascertain learners' experiences and perceptions of the value of integrating ICT into the curriculum and to establish the extent to which they believe that ICT is meaningfully integrated into the curriculum.

### 3.4 Research questions

The major question that frames this study is: "What are the learners' experiences and perceptions of the value of integrating ICT into the curriculum and the extent to which ICT is meaningfully integrated into the curriculum?"

The subsidiary questions are grouped according to the key issues (Table 3.1).

**Table 3.1 Subsidiary questions and key issues**

<b>Issues</b>	<b>Question(s)</b>
<b>Access to ICT</b>	Where do learners say they have access to computers?
<b>Duration of ICT use</b>	For how long have learners been using computers?
<b>Purpose of using ICT</b>	For what purpose do learners use computers?
<b>Software use</b>	What kinds of computer programs do the learners use?
<b>Use of ICT within learning areas/subjects</b>	In which learning areas or subjects do learners most frequently use computers?
<b>Perceived benefits and drawbacks of ICT</b>	What are the learners' perceptions of the actual or potential benefits of integrating ICT into the curriculum? What are the learners' perceptions of the actual or potential drawbacks of integrating ICT in the curriculum?

### **3.5 Research environment and site**

The study was supposed to be conducted in all 13 secondary schools in the Grahamstown Circuit, but one of the schools opted not to take part in the study. The study was eventually conducted in 12 of the 13 secondary schools in the Grahamstown Circuit. The 12 schools are grouped according to the school categories used until 1994. The main reason is to highlight the disparities that were and still are in existence within all the DET, HOR and HOA departments even though they are now administered by one department of education.

Prior 1994, there were different departments for the different racial groups of schools. The schools with black learners were administered by the Department of Education and Training (DET); the schools with coloured learners were under the House of Representatives (HOR) the schools with mainly white learners were referred to as House of Assembly Schools (Howie, Muller & Paterson 2005). Independent Schools catered for learners who were able to pay the fees, irrespective of their racial group. I have chosen to refer to all these schools by their formerly known category except for the Independent Schools. These are five former Department of Education and Training (FDET) schools, one former House of Representatives (FHOR) school, three former Model-C schools (FMC) and three Independent Schools (IS). The reason for coding the schools was to differentiate between the various schools and make data analysis and reporting easier. Twelve of the schools responded to the call to participate in the study; FDET2 failed to respond after several requests to do so.

### **3.6 Participants**

The researcher asked each of the 12 schools to select ten learners, two from each of grades 8, 9, 10, 11 and 12 to participate in the study. Of the 120 questionnaires sent, 106 were completed resulting in a response rate of 88%. Table 3.2 below shows a true reflection of the exact number of learners who responded to the questionnaires that were sent to the schools.

**Table 3.2 Number of learners from each grade who responded to the questionnaire from each school**

<b>Schools</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	
FDET1			2	2	2	2	1	<b>9</b>
FDET3			2	3	1	2	2	<b>10</b>
FDET4			0	0	0	5	1	<b>6</b>
FDET5			1	2	2	4	0	<b>9</b>
FDET6			2	0	2	2	0	<b>6</b>
FHOR			0	0	0	7	0	<b>7</b>
FMC1	2	1	1	3	2	0	0	<b>9</b>
FMC2			2	2	2	2	2	<b>10</b>
FMC3			2	2	2	2	2	<b>10</b>
IS1			2	2	2	2	2	<b>10</b>
IS2			2	2	2	2	4	<b>12</b>
IS3			2	2	2	2	0	<b>8</b>
<b>TOTAL</b>	<b>2</b>	<b>1</b>	<b>18</b>	<b>20</b>	<b>19</b>	<b>32</b>	<b>14</b>	<b>106</b>

As can be seen from FDET4 school only Grade 11 and 12 learners completed the questionnaire; despite the requests of the researcher for learners from Grades 8 to 12 to be included. At the FHOR school unfortunately only Grade 11 learners completed the questionnaire, skewing the overall responses from Grades 11. An additional anomaly was that the FMC1 school included learners from Grades 6 and 7, which the others did not. As this is an exploratory study (Mouton 1996:103), the researcher decided to include the responses from these schools.

I subsequently conducted a focus group interview at each of the 12 schools which served to clarify some of the questionnaire data. Table 3.3 shows the exact number of respondents in each focus group interviews for all 12 secondary schools. The total number of respondents for the focus group interviews is 83(69%). The interviews range from grades 6 to 12 for boys and girls.

**Table 3.3 Number of respondents in the focus groups**

<b>Schools</b>	<b>Focus group interview</b>	<b>Boys</b>	<b>Girls</b>	<b>Type of school</b>
FDET 1	1	5	2	Boys and girls
FDET 3	2	6	2	Boys and girls
FDET 4	3	3	0	Boys and girls
FDET 5	4	4	2	Boys and girls
FDET 6	5	3	6	Boys and girls
FHOR	6	5	3	Boys and girls
FMC 1	7	10	0	Boys
FMC 2	8	6	2	Boys and girls
FMC 3	9	0	6	Girls
IS 1	10	0	8	Girls
IS 2	11	3	0	Boys and girls
IS 3	12	7	0	Boys
<b>Total</b>		<b>52</b>	<b>31</b>	

There were more boys 52 (63%) than girls 31 (37%) who were part of the focus group interviews. It is also necessary to acknowledge that 8 schools are co-ed, while 4 of the schools are either for boys or girls only. To be more specific, FMC 1 and IS 3 are for boys only whereas FMC 3 and IS 1 are for girls only. I have chosen to draw attention to the gender of the learners from each grade and school. The reason for this is mainly to give a hint at how this may have impacted on the engagement I had with the learners. This is clearly indicated and discussed in Chapter 4 in (Figure 4.21) and referred to earlier in Chapter 2.

### **3.7 Data collection methods**

In this study the data was collected through questionnaires and focus group interviews (semi-structured).

#### ***3.7.1 Questionnaires***

According to Oppenheim “the questionnaire is an important instrument of research, a tool of data collection [and that] its function is measurement” (1992: 100). Likewise, Walker suggests that:

Questionnaires may be considered as a formalized and stylized interview or interview by proxy. The form is the same as it would be in a face to face interview, but in order to remove the interviewer the subject is presented with what essentially is a structured transcript with the responses missing. (1985:91)

Gillham reiterates that “questionnaires are just one range of ways of getting information from people (or answers to our research questions) usually but not always, by asking questions” (2000:2). Cohen and Manion (1994) state that, “the appearance of the questionnaire is vitally important” and “it must look easy and attractive” (1994:96). The design of the questionnaires I used for the survey was simple to suit the targeted audience who were secondary school learners. I made sure that the questions were clear and uncomplicated so that the learners would not be confused. “Clarity of wording and simplicity of design are essential” and “clear instructions should guide respondents” (Cohen & Manion 1994:96). I used a combination of open-ended and closed-ended questions. There were 14 questions altogether, where seven (1, 2, 3, 5, 6, 8 & 10) were closed-ended and seven (7, 9, 11, 12, 13, & 14) were open-ended. The purpose for including the open-ended questions was to elicit the learners’ voices on the use of computers in their learning areas or subjects. Cohen, Manion and Morrison state that: “open-ended questions invite an honest, personal comment from the respondents in addition to ticking numbers and boxes” (2000:255). The closed-ended questions included three (2, 6&8) multiple-choice questions where learners had to choose the appropriate answer(s). Cohen *et al.* (2000) suggest that, “to try to gain some purchase on complexity, the researcher can move towards multiple choice questions, where the range of choices is designed to capture the likely range of responses to given statements” (2000:251). The range of closed-ended

questions also included dichotomous questions (1&3), which were among the first questions of the questionnaire. There are a number of reasons for this, namely to prevent the respondents from being overwhelmed by questions that require them to think right from the outset, and also expecting learners to give a straight answer and lastly to direct learners to which subsequent questions to answer depending on the yes or no response. As Cohen *et al.* explain:

“the dichotomous question is useful, for it compels respondents to ‘come off the fence’ on an issue [and also] useful as a funnelling or sorting device for subsequent questions, for example if you answered “yes” to question X please go to question Y; if you answered “no” to question X, please go to question Z” (2000:250).

Finally, I assumed that learners who say they have used computers before must have used them at home, school or at another location which learners had to specify.

**Questionnaires** (Appendix A) were sent to the schools before the focus group interviews were conducted. The aim of sending questionnaires beforehand was to gather general data from the respondents. Data gathered from the questionnaires helped me identify topics for the focus group interviews. Wellington states that, “the respondent may be more articulate in writing or perhaps more willing to divulge views, especially if anonymity is assured” (2000:106). Hence, Gillham (2000) states as one of the advantages of using questionnaires that

“Respondents can answer in their own time and at their own pace. If they want to think about their answers (or go and check something) then they can do so, [in addition] some people will undoubtedly feel freer in an anonymous style of responding ...” (2000:7).

I developed my focus group interview schedule once I had analysed the questionnaire data as the latter raised issues that needed further investigation or clarification in the focus group interviews.

### **3.7.2 Focus group interviews**

Schurink, Schurink and Poggenpoel (as cited in De Vos 1998) describe a focus group interview as, “ a purposive discussion of a specific topic or related topics taking place between eight to ten individuals with a similar background and common interests” (1998: 314). Berg (1998) further describes focus group interviews as being “extremely dynamic” because the “interactions among and between group members stimulate discussions in which one group member reacts to comments made by another” (1998:124). Moreover, focus group interviews were more relevant for this study as the respondents were teens and Berg (1998) regards “focus groups [as] an excellent means for collecting information from young children and teens...” (1998:123).

I conducted semi-structured **focus group** interviews using the question schedule that I compiled for each interview (Appendix C). Focus group interviews were originally planned to include one learner from each grade 8-12 from each school. Unfortunately due to the learners’ activities the focus groups varied more than I planned, but number of learners varied from three to ten learners in each focus group from each school (see Table 3.3). Their respective schools chose the learners and most were interviewed on the school premises after school hours in order to avoid disrupting their school programme.

The semi-structured focus group interview assisted me in establishing what the learners think of the integration of ICT to their learning and to what extent ICT is integrated into the curriculum. Hall and Higgins’ 2005 study similarly used “a semi-structured interview schedule which was felt could provide something of a framework within which students could express their own views and feelings ... while also providing answers to the research questions” (2005:105). In addition, I hoped that any stumbling blocks of ICT integration in the curriculum would be uncovered and I encouraged the learners to come forward with their collective recommendations for the successful integration of ICT into the curriculum. There were five FDET schools that I conducted focus group interviews in, and they are (FDET1, FDET3, FDET4, FDET5 & FDET6) (see Table 3.3). In four of the five FDET schools I conducted the focus group interviews mainly in isiXhosa and partially in English, (Appendix G), as some of the learners were more conversant in isiXhosa than in English. In order for my

supervisor, examiners and subsequent non-IsiXhosa speaking readers to understand the content of the interviews, I had to translate all the transcripts in English.

### **3.8 Trustworthiness of the research study**

Merriam (2001) states that research results are trustworthy to the extent that there has been some accounting for their validity and reliability...” (2001:198). Cohen *et al.* (2000) define validity as “an important key to effective research [and] a requirement for both quantitative and qualitative/naturalistic research” (2000:105). Furthermore, “in qualitative data validity might be addressed through the honesty, depth, richness and scope of the data achieved, the participants approached, and the extent of triangulation ...” (Cohen *et al.* 2000:105). Merriam (2001) again explains that, “... validity and reliability are concerns that can be approached through careful attention to a study’s conceptualization and the way in which the data were collected, analyzed, and interpreted, and the way in which the findings are presented” (199-200).

I have used the four components of “trustworthiness” as a framework for discussing the trustworthiness of my study.

#### **3.8.1 Credibility**

Terre-Blanche and Durrheim (1999:63) highlight that “credibility of research is established while the research is being undertaken”. In terms of the ‘credibility’ of the interviews that I conducted with the learners, I did not return for the member checking because it would not have been practical for the following reasons:

- For the protection of the learners’ identity, the questionnaires clearly stated that learners should not write down their names.
- During focus group interviews, learners only gave their first names and some of them were not captured during the recording of the interviews.

I instead depended on a peer to examine the transcripts for all the focus group interviews and to check that the transcript was an accurate record as I knew that I needed to guard against imposing my interpretation on the participants’ perspectives. As Maxwell argues: it is most

important “to learn how the participants in your study make sense of what’s going on, rather than pigeonholing their words and actions in your own framework” (1996:90). It is further explained by Henning *et al* (2004) “the role of the researcher in the qualitative analysis refers particularly to awareness of bias and preconceived ideas, since assumptions may hide the evidence of the data” (2004:129).

### **3.8.2 Dependability**

“Reliability refers to the extent to which research findings can be replicated” (Merriam 2001:206). However, it is not the intention of this study to create room for reproduction of the same results but, “wish the readers to concur that, given the data collected, the results make sense-they are consistent and dependable” (Merriam 2001:206). Terre Blanche and Durrheim say that “Dependability refers to the degree to which the reader can be convinced that the findings did indeed occur as the researcher says they did” (1999:64).

For the findings of this study to be dependable the learners’ “voices” were used by directly quoting the learners’ responses and this is reflected in the data analysis process where the exact words of the learners were typed into the Excel spreadsheet – phrase by phrase – so that the category in which these phrases were placed could be doubled checked.

### **3.8.3 Confirmability**

Cohen *et al* (2000) define triangulation as “the use of two or more methods of data collection in the study ...” (2000:112). According to Denzin and Jick (1970; 1983 cited in Arksey and Knight (1999), “triangulation serves two main purposes: *confirmation* and *completeness*” (1999:21). Merriam concurs that, “...in terms of using multiple methods of data collection and analysis, triangulation strengthens reliability as well as internal validity” (2001:207).

In this exploratory study I gathered data through two methodologies namely, questionnaires and semi-structured focus group interviews. The study commenced with the distribution of a questionnaire and I subsequently conducted focus group interviews with the respondents in attempt to get more clarity, and comprehensive understanding, and confirmation and extension of questionnaire data.

### **3.8.4 Transferability**

Smaling (1992) as cited in Terre–Blanche and Durrheim states that, “to create a foundation for transferability and allow other researchers to use the findings in making comparisons with their own work, a researcher report must contain an accurate description of the research process, and ... a detailed description of the research situation and context” (1996: 381). This study has attempted to establish the learners’ perceptions of the value of integrating ICT into curriculum and the extent to which they believe that ICT is meaningfully integrated into the curriculum. The findings for both quantitative and qualitative methods were “supported by the ‘raw’ data from which the finding was derived” (Merriam 2002:22).

Merriam further states that, “a small sample is selected precisely because the researcher wishes to understand the particular in depth, not to find out what is general true to many” (2002:28). It is therefore the purpose of this study to elicit learners’ perceptions and to describe the learners’ perceptions in sufficient detail for others to relate to different contexts (Wisker 2001)

## **3.9 Ethical issues**

I requested permission from the principals of the secondary schools to undertake my research in their schools. A letter was written to the principals of the secondary schools (Appendix B). Creswell (2002 cited in Mertens 2005) explains that:

“other procedures during data collection involve gaining permission of individuals in authority to provide access to study participants at research sites. This often involves writing a letter that identifies the extent of time, the potential impact, and the outcomes for the research” (Mertens 2005:65).

The questionnaires stated clearly that the respondent’s name should not be written so as to protect their identity. As a researcher I have to assure the participant that what he/she says will be treated with confidentiality. Cohen *et al.* (2000:62) argue that, “the ... way of protecting a participant’s right is through the promise of confidentiality”. Likewise, Powney and Watts (1987) strongly recommend that “... the interviewer needs to set the scene,

confirming the purpose of the interview, confidentiality, indicating what is expected from the interviewee” (1987:131). In every focus group interview, I first introduced myself and told my respondents what the session was about, what was expected of them and that what they said would be treated in strict confidence. Furthermore I dealt mostly with young learners in my research and so I made sure that I did not use my powers as an adult to get what I want from them. Brenner *et al.* (1985 as cited in Siedman 1991) argue that interviewing participants who are much younger takes a special type of sensitivity on the part of the interviewer and that the interviewer must know how to connect to children without patronizing them.

The audio tapes will be kept until after the examination process and then destroyed in order to protect the identity of the learners involved in the focus group interviews.

### 3.10 Research activities

The next table reflects when the research activities took place from 2004-2007.

**Table 3.4 Research activities and when they took place**

<b>Activity</b>	<b>Dates</b>
Literature review	February 2004
Development of proposal	February-October 2004
Draft questionnaires, draft focus group interview schedule	April-May 2004
Pilot test questionnaires and interviews	May 2004
Appointments to meet principals and distribute questionnaires	June-October 2004
Analyse questionnaires to prepare the focus group interview schedule	June –October 2004
Compiled final focus group interview questions and conduct focus groups	June 2005-November 2005
Transcribed focus group interviews and relate to questionnaire data	May 2006-November 2006
Write up report	December 2006-September 2007

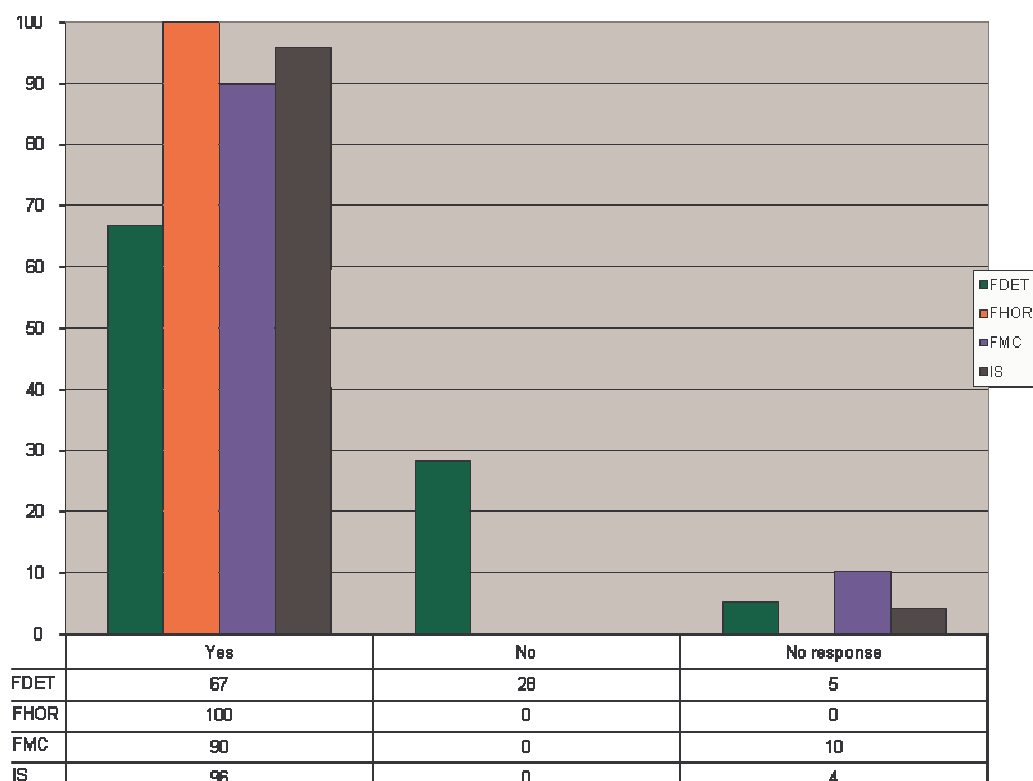
### **3.11 Data analysis**

Wellington states that, “data analysis is an integral part of the whole research process (2000:134). Likewise, Henning, van Rensburg and Smit state that “the analysis process is the ‘heartbeat’ of the research” (2004:103). The data collected was rich and therefore it was necessary for me to interrogate it carefully to identify the common threads or patterns that shape the picture of the research. Bogdan and Biklen argue that “analysis of data involves working with data, organizing it, breaking it down, synthesizing it, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others”(1982:154). There was an overwhelming amount of data from the questionnaires and different themes emerged but some were common in the different schools. For example, there are questions where learners had responses that were common in almost all the school groups.

To make data analysis manageable, all the returned questionnaires were sorted according to the schools four categories namely FDET, FHOR, FMC and IS. These questionnaires were then labelled alphabetically. Since my study is part of a three-part project, it was given number 3 whilst other studies were labelled 1 (Infrastructure) and 2 (Teachers’ perspective) respectively. The next step was to sort each school category in an alphabetic manner according to school names. The whole process worked in such a way that each school had its category type and the number for the order meaning that if the school belonged to the FDET category, it would then be labelled as FDET1/Q3.

#### ***3.11.1 Quantitative data analysis***

For Questions 1, 2, 3,5,6,8 and 10 of the questionnaire, I used MS Excel to capture the responses, calculate the responses and draw graphs. Figure 3.1 illustrates Question 1 on learners’ access to computers.



**Figure 3.1 Example of quantitative data analysis using a graph (MS Excel)**

This graph is intended to illustrate learners’ access to computers.

### 3.11.2 Qualitative data analysis: Questionnaire

I also used *MS Excel* to capture the learners’ responses to the open-ended questions (4, 7, 9,11,12,13, &14) in the questionnaire and to classify their responses into various categories in a similar manner to how qualitative software is used. The kind of coding category that I developed is what Bogdan and Blikien refer to as “Perspectives held by subjects” which include “codes orientated towards ways of thinking all or some subjects share that are not as general as their overall definition of the situation but indicate orientations towards particular aspects of setting” (1992:168). In this study I was interested in the learners’ ways of thinking about how ICTs are used in teaching and learning.

Firstly, I typed in each response verbatim into MS Excel, one phrase or distinguishable “meaning unit” at a time to enable me to categorise the responses into various categories that emerged from the responses. In other words I used a “bottom-up” approach or what is also referred to as “in vivo coding” (Coffey & Atkinson, 1996:32). As I typed in the first phrase or “meaning unit” along with the code for the questionnaire (e.g. FDET1/Q3.4/Q3A). I created a category to summarise the essence of what was being expressed and typed this category into the third column of the spreadsheet (See Figure 3.2). I then typed in the next phrase, and compared its meaning to the first category and if it was different; I added a further category in column 4. This process was repeated for every response to the open-ended questions each Question having a worksheet of its own.

I attempted to identify themes and patterns that emerged from the questionnaire data. The next two figures (3.2 & 3.3) present how the process of the analysis was practised from the labelling of respondents to the classification of responses to various categories.

School/Question/Respondent	COMMENT	No comment	Learning areas	Computer games	Computer literacy	Internet	Communication	Obtaining information	Typing	Homework	Learning	Projects	Research	Printing	e-mail	Essays	Programming	Creating viruses
1	FDET1/Q3.4/Q3A																	
2	FDET1/Q3.4/Q3A																	
3	FDET1/Q3.4/Q3A																	
4	FDET1/Q3.4/Q3B																	
5	FDET1/Q3.4/Q3B																	
6	FDET1/Q3.4/Q3C																	
7	FDET1/Q3.4/Q3C																	
8	FDET1/Q3.4/Q3D																	
9	FDET1/Q3.4/Q3D																	
10	FDET1/Q3.4/Q3E																	
11	FDET1/Q3.4/Q3E																	
12	FDET1/Q3.4/Q3E																	
13	FDET1/Q3.4/Q3F																	
14	FDET1/Q3.4/Q3F																	
15	FDET1/Q3.4/Q3F																	
16	FDET1/Q3.4/Q3G																	
17	FDET1/Q3.4/Q3G																	
18	FDET1/Q3.4/Q3H																	
19	FDET1/Q3.4/Q3I																	
20	FDET3/Q3.4/Q3A																	

Figure 3.2 Example of how respondents were labelled using MExcel

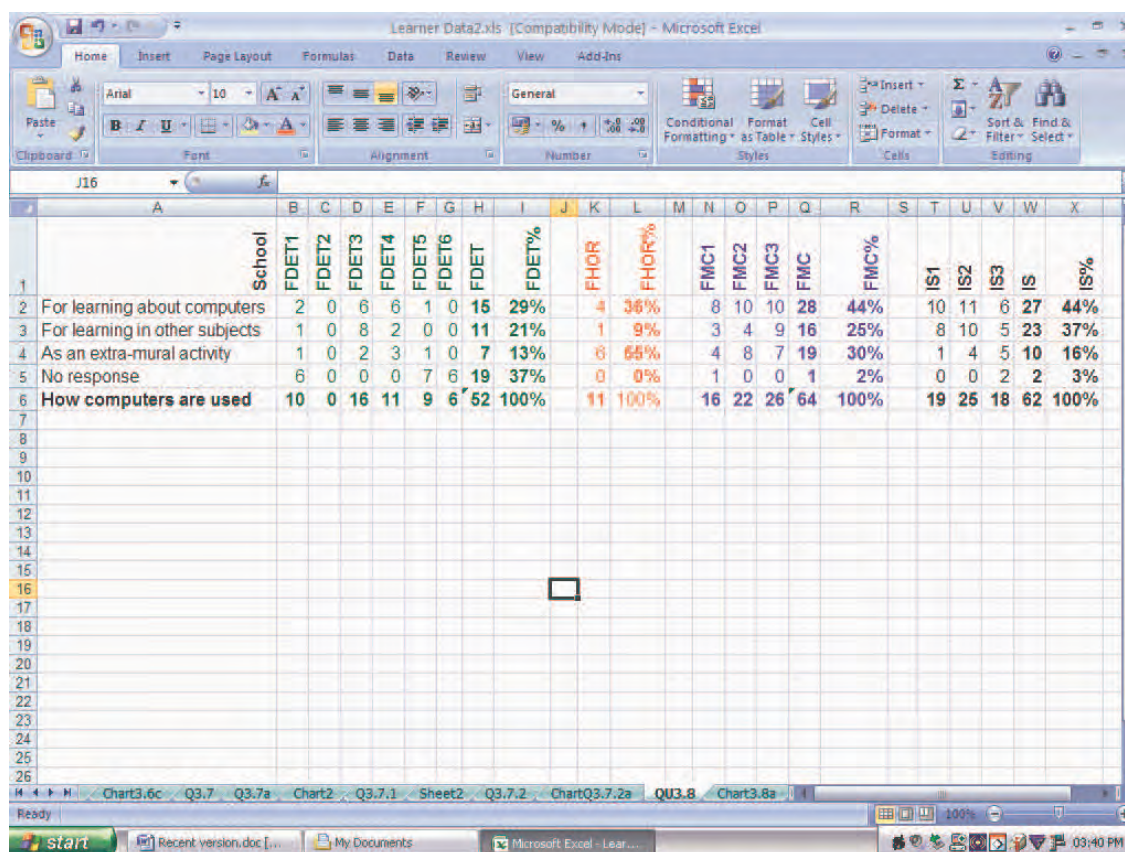


Figure 3.3 Example of various categories of schools

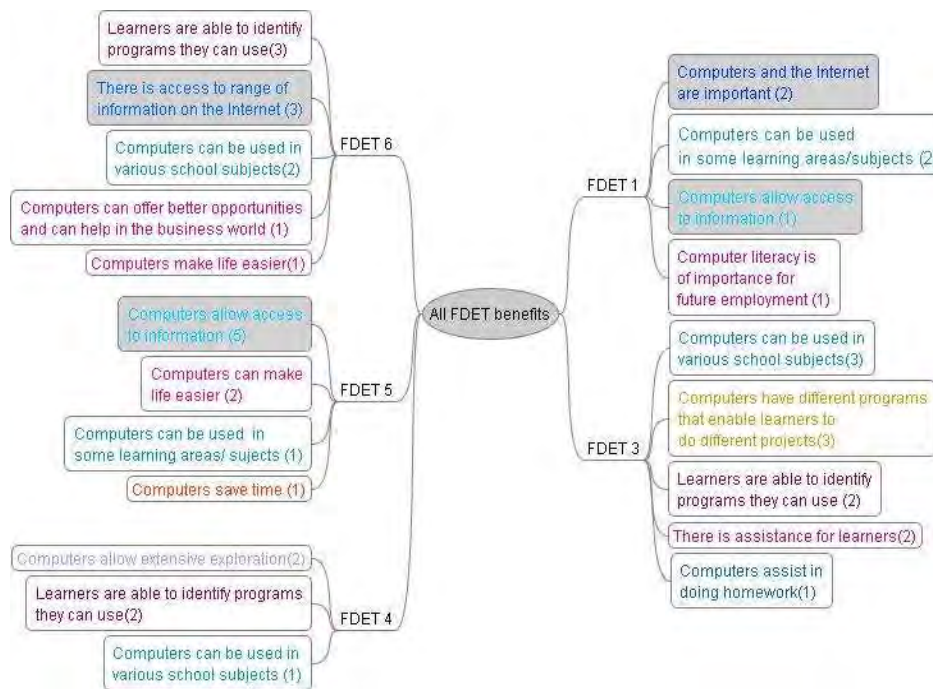
### 3.11.3 Qualitative data analysis: Focus group interviews

The audio taped data from the learners’ focus group interviews was transcribed and analyzed and related to the data from the questionnaires. Kvale (1996:160) refers to transcription as “an interpretative process” and “the translation from oral conversations to written texts”. Henning *et al* argue that “before you begin with an analysis, data are transcribed, which simply means that texts from interviews ... are typed into word-processing documents” (2004:127). I then used *Freemind*<sup>1</sup> Open Source mind mapping software to analyse the focus group interviews (this is illustrated in more detail in Chapter 4).

In Chapter 4 I analyze the data guided by the questions that I asked from the questionnaires. The analysis is presented by tables, graphs, pie charts and discussions based on the learners’

<sup>1</sup> In 2006 and 2007 this program was available at [http://freemind.sourceforge.net/wiki/index.php/Main\\_Page](http://freemind.sourceforge.net/wiki/index.php/Main_Page)

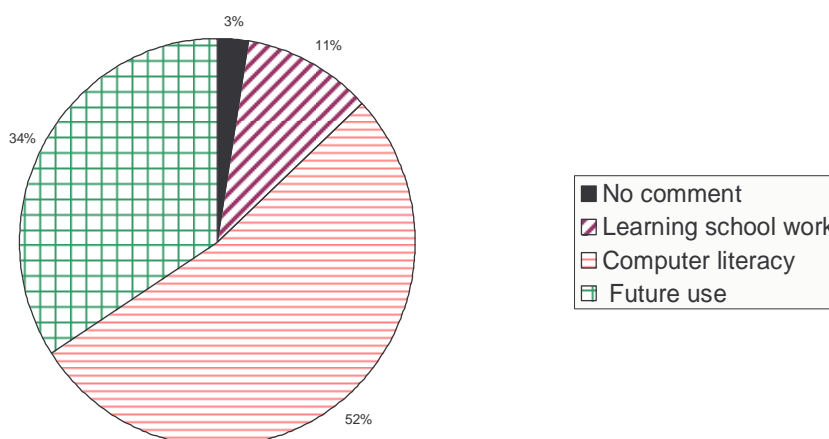
responses on the issues such as access, benefits and drawback/disadvantages of using computers.



**Figure 3.4 Example of data analysis using Freemind Open Source mind mapping software**

I used *Freemind* to categorise how learners from the FDET schools responded to how they perceive the Internet as the source of information. The first step was to identify themes from the learners’ responses and the process took place across the four categories of schools i.e. (FDET, FHOR, FMC & IS). The second step was to develop categories from the themes. I used the same colour of text for the learners’ comments that fell into the same category and also stated how many times it occurred in the same school. The colour coding was intended to help me analyse and for the reader to identify the common categories from the schools of the same category i.e. FDET1, FDET3, FDET4, FDET5, FDET6 (Figure 3.4). The discussion in Chapter 4 for each *Freemind* map is based on the shaded categories so as to limit chances of confusion for the reader.

FMC SCHOOLS LEARNERS



**Figure 3.5 Example of data analysis using a pie chart (MS Excel)**

Figure 3.5 illustrates what the learners think teachers should be asking them to use computers to do and reveals the proportion of each activity. This is Question 12 of the questionnaire and the above chart shows the next step after the process of categorising the learners’ responses on each worksheet for each question. I used the number of comments of the various categories to create a pie chart to graphically represent the FMC schools learners’ perceptions.

**Table 3.5 Example of data analysis using a table**

<b>Negative impact on learners</b>	Computer illiteracy (12)	<b>43%</b>
	Laziness (11)	
	Encourage cheating/plagiarism (6)	
	Distraction (4)	
	Health risk (4)	
	Discourage writing with using pen and paper (4)	
	Relying on it too much (3)	
	Prevent creative thinking (2)	
	Addiction (2)	
	Language used (1)	
	Games (1)	

	Vocab doesn't improve (1)	
	Books neglected (1)	
<b>Hardware</b>	They are slow (5)	<b>28%</b>
	Expensive (5)	
	Number of computers used by learners (5)	
	Complicated (4)	
	Useless without electricity (4)	
	Loss of work (3)	
	Computers get broken (2)	
	Printing problems (2)	
	Need to be upgraded (1)	
	Need for security (1)	
<b>Inaccurate or excessive information on the Internet</b>	More information (2)	<b>5%</b>
	Less time too much information (2)	
	Internet (1)	
	Internet access	
	Have incorrect information (1)	
<b>Impact on teaching and learning</b>	No interaction between teachers and learners (2)	<b>3%</b>
	Not effective compared to a teacher (1)	
	Can't be used during exams (1)	
<b>No comment</b>	No comment	<b>11%</b>
<b>None/Unsure</b>	None (12)	<b>10%</b>

This table particularly summarised the learners' perceptions of the drawbacks or disadvantages of using computers in learning areas/subjects in ranked order. This is Question 13 of the questionnaire and again used the same process of categorising but for this particular table, I actually counted how often each comment was made for each category. I then grouped according to the various categories which are in column two of the above table. The next step was to organise the perceptions in a ranked order and work out the percentage value to obtain an overall pattern of the qualitative responses.

### 3.12 Summary

This chapter highlighted issues such as the orientation of the study, which in this case is the interpretive paradigm, and the exploratory study which made use of questionnaires and focus group interviews. The procedure for each of these different ways of collecting data entailed ethical issues, which are elaborated upon. In trying to ensure that data analysis was trustworthy I had to ask a peer to examine all the transcripts of all the focus group interviews I conducted. I also explained the use of *MSExcel*, *Freemind* and *MSWord tables* in the analysis of the questionnaire data and the interview data respectively. The next chapter provides a detailed analysis of the questionnaire and interview data.

## Chapter 4: Data Presentation and Discussion

*Data presentation and analysis involve making sense out of what people have said, looking for patterns, putting together what is said in another place, and integrating what different people have said*  
(Patton 1990: 347)

### 4.1 Introduction

This chapter deals with the analysis and interpretation of data from the questionnaires and focus group interviews I use the subsidiary research questions as a framework to report on learners' views on their prior use of computers, access to ICT, duration of computer use, purpose of ICT use, software use, integration of ICT within the learning areas or subjects, benefits and drawbacks of using ICT in the curriculum. There are unexpected results as far as access and integration are concerned, and these are discussed in more detail in this chapter.

The matrix in Table 4. 1 provides an overview of how data from the questionnaires and the focus group interviews were use to report on the key research issues. The two questions in brackets indicate the questions that were not reported upon and where they were intended to contribute to the key issues.

**Table 4. 1: Matrix of key research issues and data used to address them**

Key issues	Questionnaire questions	Focus group interview responses
Prior use of computers	Q1, Q3	-
Access to ICT	Q2	-
Duration of ICT use	Q5	-
Purpose of using ICT	Q6, Q4	-
Software use	Q7	-
Use of ICT within learning areas/subjects	Q8,Q9, (Q10), Q12, (Q14)	✓
Perceived benefits and drawbacks of ICT	Q11, Q13	✓

The data presentation and discussion excluded two questions (10 &14) as:

- Most of learners from the four school categories didn't clearly state the number of hours in response to the options in Question 10; the data was not sufficiently useful.
- The last question (Question 14) was not popular with a large number of learners and some didn't respond at all whilst others misunderstood, judging from the responses they gave which were out of context I decided that the data from these questions was not reliable and therefore did not include them in the discussion.

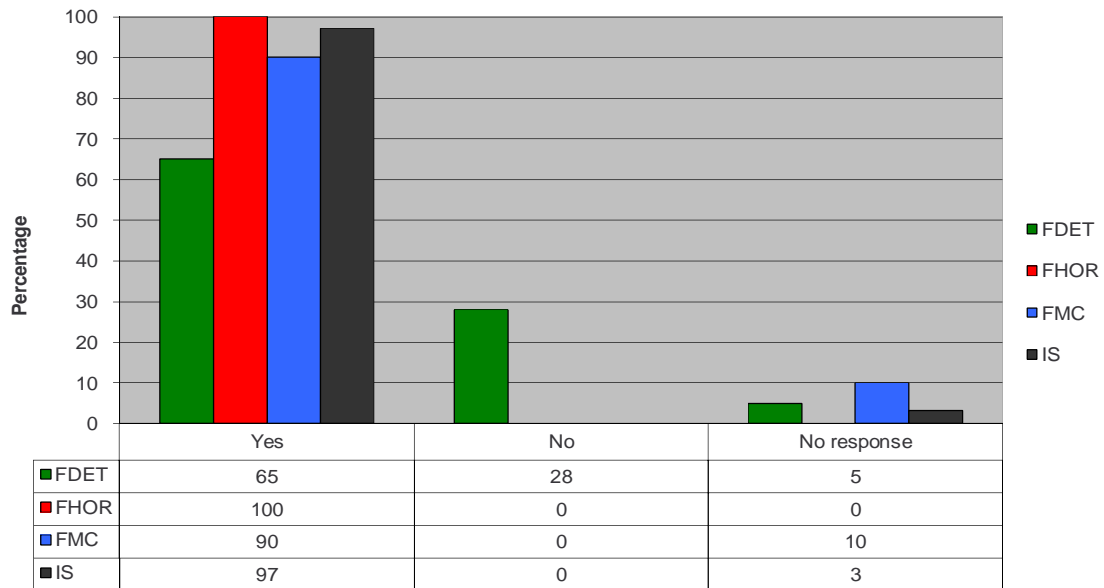
## 4.2 Prior use of computers

The first question posed to the learners in the questionnaire was whether or not they had used computers before. Between 90%-100% of the learners from the four groups of schools responded, with an average response rate of 93% (Table 4. 2).

**Table 4. 2: Response rate to Question 1**

Question 1	FDET N=40	FHOR N=7	FMC N=29	IS N=30	All Schools N=106
Have you used a computer before?	37 93%	7 100%	26 90%	29 97%	<b>99</b> <b>93%</b>

The next graph illustrates the responses to the first question of the questionnaire (Figure 4.1). Learners were expected to indicate whether or not they had used computers before.



**Figure 4.1 Learners’ prior use of computers**

The response from the FHOR school indicates that 100% of these learners have used computers before, but as I have indicated in Table 3.2 only the Grade 11s completed the questionnaires, so this might not be a true reflection of the level of use for all the learners. Ninety percent of the IS learners in this study and 97% percent of the FMC learners indicated that they have used computers before. However, only 65% of the learners from the FDET schools say they have used computers before and they are the only ones who indicated a definitive ‘no’ response (28%), probably indicating that they do not have access to computers as yet.

It is also interesting to note the absence of responses as these may indicate that students do not have adequate access to computers as yet. In particular it is surprising that 10% of the students in the FMC schools did not respond even though they have access to a number of computers at their schools (Brandt 2006). By contrast it is equally surprising that so many of the FDET learners report having used computers before as their schools do not have adequate computer facilities (Brandt 2006).

Questions 3 and 4 were only relevant to FDET schools as they are the ones with limited or no access to computers and so other school categories (FHOR, FMC & IS) did not respond as they already have access to computers. Table 4.3 represents the responses that the FDET schools provided for Question3. Question 4 is discussed later.

**Table 4. 3: FDET schools responses for Q3**

<b>Question 3</b>	<b>School</b>	<b>Yes</b>	<b>No</b>	<b>No responses</b>
<b>Would you like to use a computer?</b>	<b>FDET1</b>	<b>8</b>	<b>0</b>	<b>1</b>
	<b>FDET3</b>	<b>6</b>	<b>0</b>	<b>3</b>
	<b>FDET4</b>	<b>3</b>	<b>0</b>	<b>3</b>
	<b>FDET5</b>	<b>9</b>	<b>0</b>	<b>0</b>
	<b>FDET6</b>	<b>4</b>	<b>0</b>	<b>2</b>
	<b>TOTAL</b>	<b>30</b>	<b>0</b>	<b>9</b>

The learners from the FDET schools indicated that they would like to use computers (30 comments) which suggests that they have limited access to computers. The finding that learners from the FDET schools have limited access to computers is reinforced by other responses to the questionnaire and is congruent with the findings from Brandt (2006).

**4.3 Access to computers**

The second question of the questionnaire, which was conditional on the first, asked learners to indicate where they have access to computers. Because many of the learners are not English first language speakers, the question to the learners was phrased colloquially as “Where have you used a computer?” rather than a more formal question “Where do you have access to a computer?” even though “access” is the underlying concept.

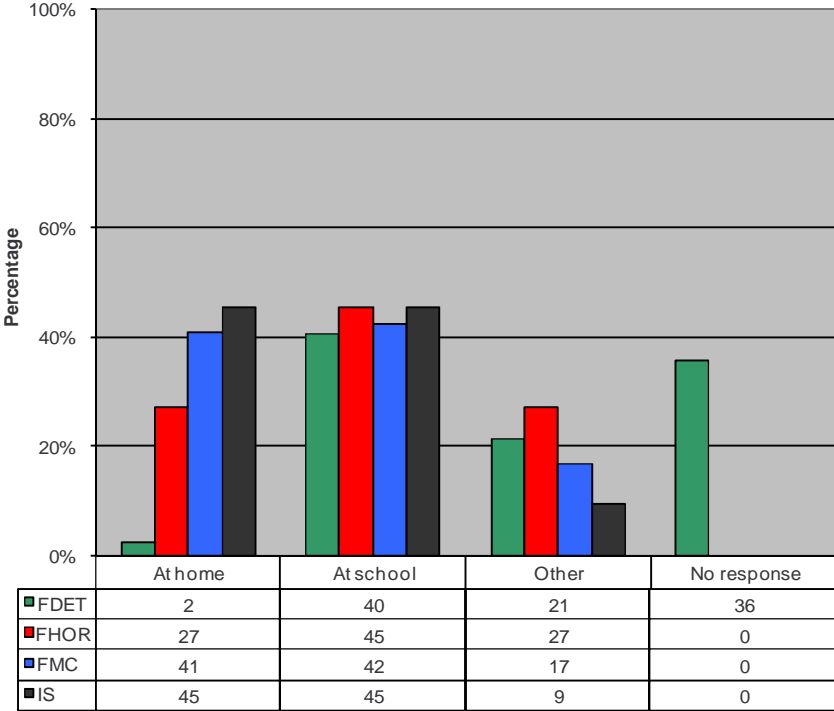
The response to the second question was determined by the first one. If learners answered “yes” in the first question, then it would mean that there would be an indication of whether the computers are used at home, school or another place which they had to specify. If the answer was “no” to Question 1, then there would be no response for this question, as is the case of 36% of the learners from the FDET schools. All learners from the other groups of

schools responded to this question. The total number of responses for all the groups of schools for this question is therefore 91 (86%) (Table 4. 4).

**Table 4. 4: Response rate to Question 2**

Question 2	FDET N=40	FHOR N=7	FMC N=29	IS N=30	<b>All schools N=106</b>
Where have you used a computer?	25 63%	7 100%	29 100%	30 100%	<b>91 86%</b>

There was a 63% response rate for the FDET schools learners whilst it was 100% for all the FHOR, FMC and Independent Schools. Figure 4.2 provides further details on where learners say they have access to computers.



**Figure 4.2 Places where learners use computers**

From the FDET schools only 2% of the learners report having access to computers at home, while 41% and 45% of learners from the FMC and Independent Schools respectively say they have access to computers at home. Twenty seven percent of the FHOR school learners claim they have access to computers at home, 25% more than the FDET schools learners.

Between 40-45% of all learners claim to have access to computers at school. FDET and FHOR schools learners have more access to computers at school than they do at home. However, 36% of the FDET learners did not respond at all, which probably means that these students do not have access to computers either at school or at home. The IS and FMC school learners have almost equal access to computers at home and at school.

When it comes to access to computers in places other than home or school, an interesting reversal of the pattern emerges with only 9% of IS learners reporting “other” access, while 27% of the FHOR learners, 21% of the FDET learners and 17% of the FMC learners report access to computers elsewhere. The “other” places that the FDET and FHOR learners mentioned as places of computer access are: *project, DSG* [Independent school], *Albany Museum, friend’s home, cousin’s house*. The “*project*” does not indicate whether this is an on going project as there is no mention of how often they attend the project session(s). Consequently, this then does not really suggest that these learners have an adequate access to computers outside of the school environment.

#### 4.4 Duration of computer use

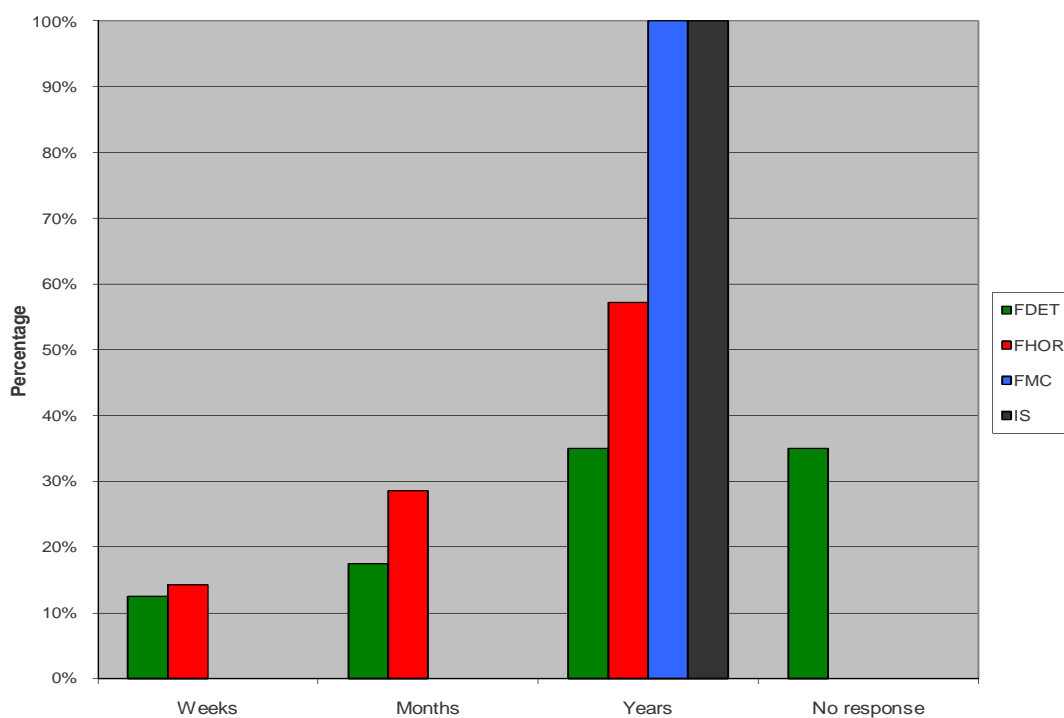
This section endeavours to establish the length of time that the learners from the different groups of schools claim to have been using computers. Table 4. 5 provides the response rate (88%) to the fifth question of the questionnaire, where learners were required to write down the number of weeks, months or years they have been using computers.

**Table 4. 5: Response rate to Question 5**

Question 5	FDET N=40	FHOR N=7	FMC N=29	IS N=30	<b>All schools N=106</b>
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For how long have you been using computers?	27	7	29	30	<b>93</b>
	68%	100%	100%	100%	<b>88%</b>

Again learners from FDET schools seem to have a lower (68%) response rate compared to the FHOR, FMC and Independent Schools. In answering Question 5, some of the learners did what was required, but others merely ticked or circled the chosen period of time, hence my reporting was forced to be per category of time rather than the length of time (Figure 4.3).



**Figure 4.3 Duration of time using ICT**

In the FMC and Independent Schools learners have been using computers for years compared to the other two schools. Once again there is quite a high “No response” (32%) response from the FDET school learners. A possible reason for this is that in all but one of the FDET

schools, FDET learners do not have access to computers at school at all, as established by my colleague in an audit of computer infrastructure in Grahamstown secondary schools (Brandt 2006).

The FHOR results may be misleading because the questionnaires were not completed by learners from all the different grades i.e. Grades 8-12 as was asked. They were completed by the Grade 11 learners only, thus skewing the findings. A total of seven Grade 11 learners completed the questionnaire and therefore it is possible that learners from other grades might have had different opinions and the data might have been different.

#### **4.5 Purpose of computer use**

This section attempts to establish the purpose for which the learners are using ICT from the analysis of Questions 4 and 6. The responses for Q4 for most learners from FDET schools seem to indicate that they would like to use computers for research (Table 4. 6), but in the focus groups they actually give an indication that they mostly use computers for projects, essays and typing.

**Table 4. 6: FDET schools collective responses for Q4**

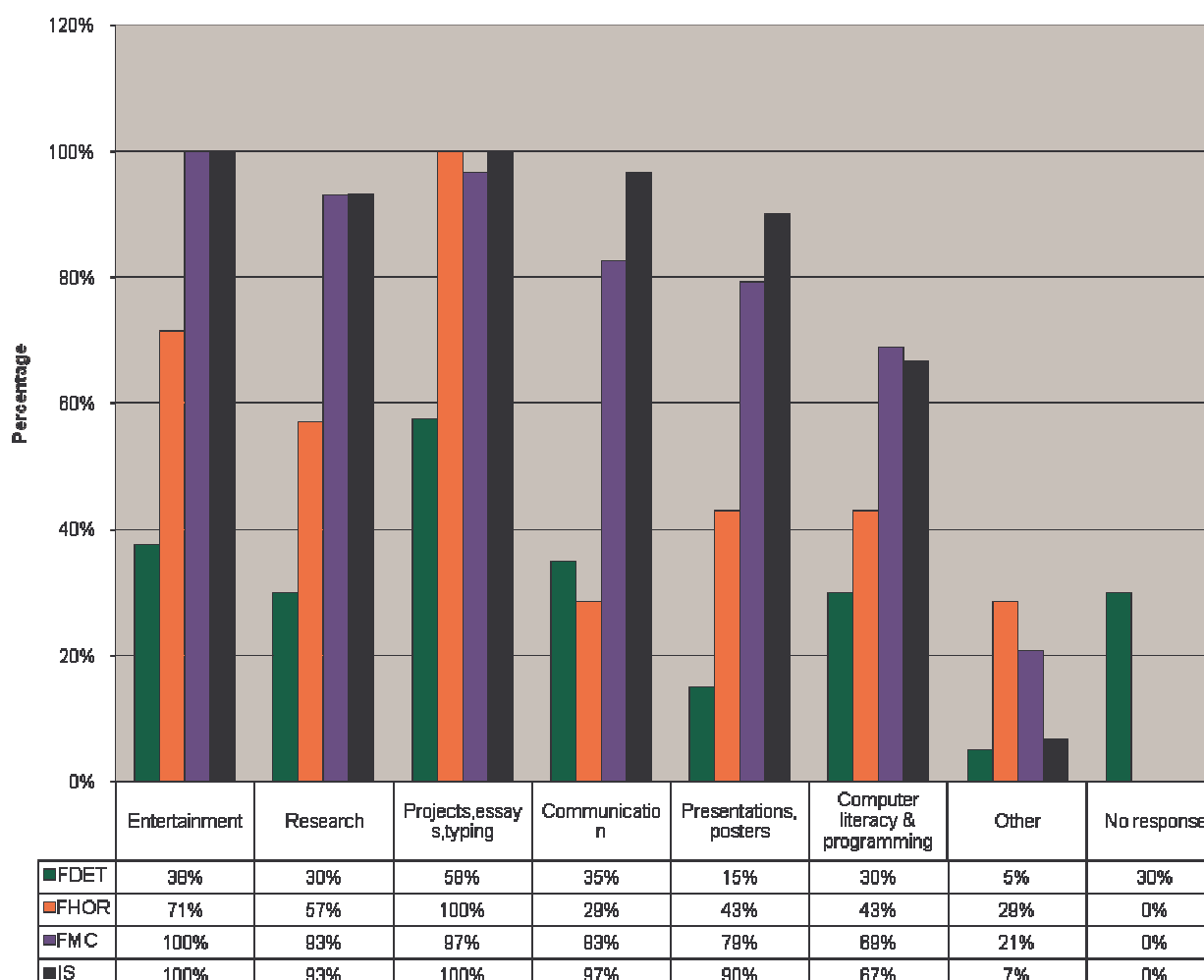
<b>Question</b>	<b>Categories that emerged</b>	<b>Number of times comments occurred</b>
<b>What would you like to use a computer for?</b>	• <b>Research</b>	<b>22</b>
	• <b>Typing projects</b>	<b>13</b>
	• <b>Computer literacy</b>	<b>10</b>
	• <b>Learning subjects</b>	<b>8</b>
	• <b>Entertainment</b>	<b>8</b>
	• <b>No comment</b>	<b>8</b>
	• <b>Communication</b>	<b>4</b>

The sixth question of the questionnaire required learners to choose the appropriate answer by ticking or specifying the other purposes for which they used ICT. The overall response rate was 89% (Table 4. 7).

**Table 4. 7: Response rate to Question 6**

Question 6	FDET N=40	FHOR N=7	FMC N=29	IS N=30	<b>All schools N=107</b>
How have you used computers? (Tick all that are appropriate)	28 70%	7 100%	29 100%	30 100%	<b>94 89%</b>

All the learners from the FHOR, FMC and Independent Schools answered this question, while only 70% of the FDET learners did so, suggesting that at least 30% of these learners don't use computers.



**Figure 4.4 Purpose for using ICT**

The purpose for which learners are using ICT in all groups of schools seems to be mostly for projects, essays and typing (between 58%-100%) and the second most important purpose is entertainment (between 38%-100%) and then only research (between 30%-93%) or communication (between 29%-97%).

A closer analysis of the responses per school groups indicates that the learners at the FDET schools are most likely to use computers for projects, essays and typing (58%), then for entertainment (38%) and then for communication (35%). The FHOR school learners – as represented by the Grade 11 learners – also use computers most frequently for projects, essays and typing, then for entertainment (71%) and then for research (57%). By contrast, the learners at the FMC schools report that they use computers most frequently for entertainment (100%) and then only for projects, essays and typing (97%) and research (93%). The learners from the Independent Schools report equal use of computers for projects, essays and typing and entertainment (100%), followed quite closely by communication (97%) and then research (93%).

In Hokanson and Hooper's (2000) terminology learners are using computers in a representational manner.

#### 4.6 Software use

I also investigated the type of software that the learners say they use most frequently. This was the seventh question of the questionnaire, which required learners to write down the actual names of the programs they are able to use. Table 4. 8 provides the overall response rate and the individual response rates from each of the types of schools.

**Table 4. 8: Response rate to Question 7**

Question 7	FDET N=40	FHOR N=7	FMC N=29	IS N=30	All schools N=106
Which programs can you use?	27 68%	7 100%	28 97%	30 100%	92 87%

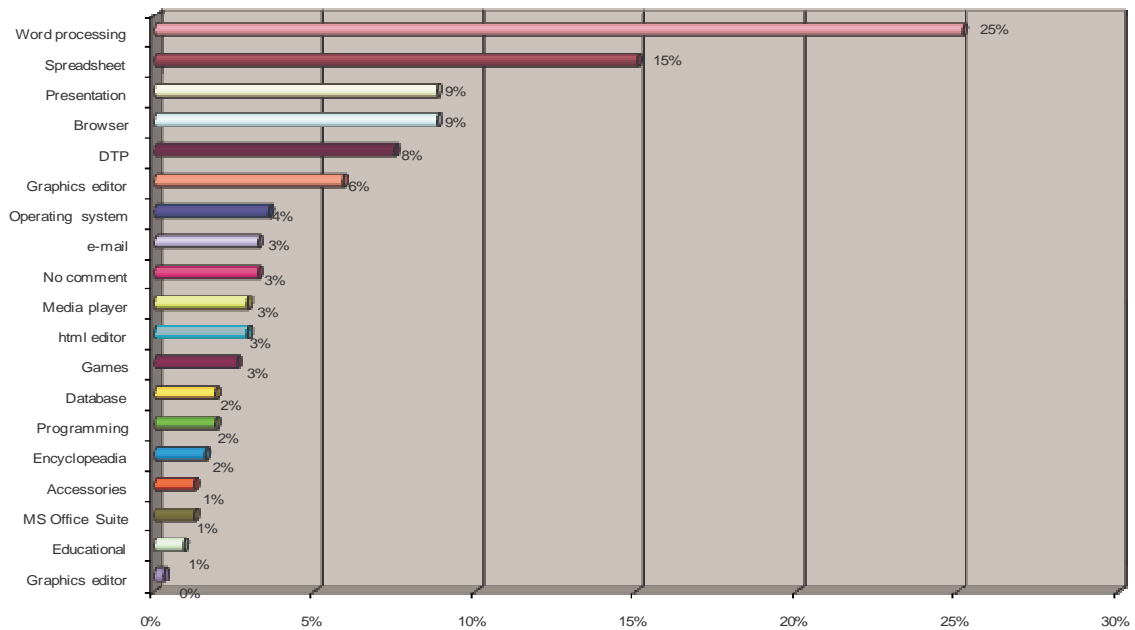
The total number of responses is 87% for all groups of schools. Learners' actual responses were grouped under major software categories, e.g. word processing, spreadsheets, presentation software. Table 4. 9 provides the detail of the responses per school group and per software category.

**Table 4. 9: Software that learners use most frequently**

<b>School group</b>	<b>No comment</b>	<b>Word processing</b>	<b>Spreadsheet</b>	<b>Presentation</b>
<b>FDET</b>	32,5%	66%	7%	3%
<b>FHOR</b>	0%	64%	36%	0%
<b>FMC</b>	1%	32%	21%	46%
<b>IS</b>	0%	37%	36%	27%

The category of software that learners from the different groups use most frequently seems to be word processing. This confirms the previous data on the purpose for which learners use ICT where they claim they use computers for typing, projects and essays. Once again 32, 5% of the learners from the FDET schools did not comment, confirming the limited access they have to computers and their consequent inability to identify computer software.

The next graph illustrates exactly which programs that the learners claim to be able to use (Figure 4.5) with the data from all schools combined to provide an overall pattern of use.



**Figure 4.5 Programs learners can use at all schools**

The most popular program that 25% of the learners from all four schools seem to be using is word processing. The other programs such as spreadsheets are only used by 15% of all learners and presentation software and Internet browsers are both used by 9% of the learners. Surprisingly both email and gaming software were only mentioned by only 3% of all the learners even though they indicated that entertainment and communication were two of the key reasons for using computers. With respect to the learners' previous claim that they used computers for research, it is also surprising that only 2% of learners mentioned the use of computers for using a digital Encyclopaedia and only 9% mentioned the name of a browser that possibly could be used to access information on the Internet.

#### **4.7 Integration of ICTs within learning areas or subjects**

In an attempt to establish to what extent learners were using computers within the curriculum, four questions (Q8, Q9 Q10 and Q12) were posed to the learners in the questionnaire and six

questions (FGQ4- 9 – See Appendix C) posed during the focus group interviews. I endeavoured to establish more specifically to what extent computers are used for merely learning *about* computers (e.g. computer literacy and programming); to what extent computers are used to support the learning of other subjects; and to what extent the use of computers is seen as merely an extra-mural activity (Q8). I then attempted to establish in which specific learning areas or subjects learners were most likely to use computers (Q9). As an indicator of frequency of use of computers, I then endeavoured to ascertain how often learners used computers in these learning areas or subjects (Q10), but unfortunately the learners did not complete the boxes as requested and the data set was therefore not complete and is therefore not referred to in this report. Finally I attempted to elicit learners’ views on the purposes for which they believe teachers should be requiring them to use computers (Q12).

#### **4.7.1 Role of computers in the curriculum**

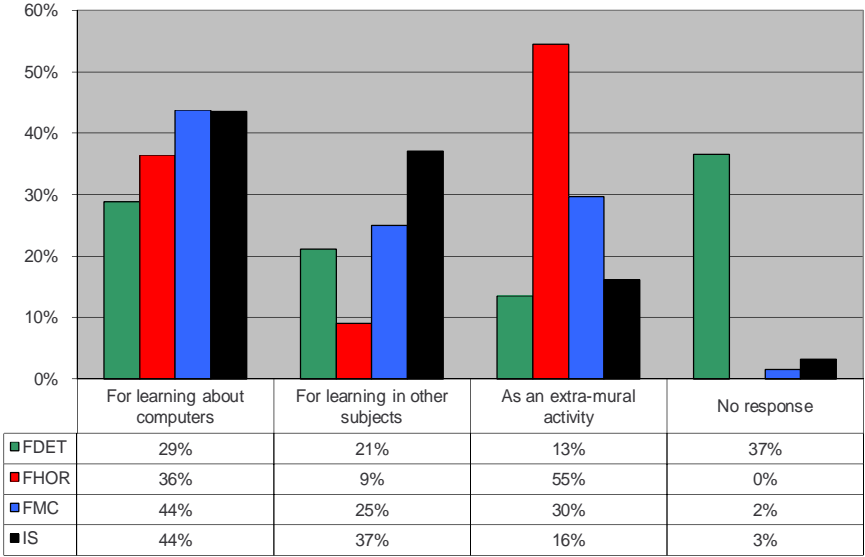
The next section focuses on learners’ perceptions about using computers for learning about computers; for learning other subjects; and as an extra-mural activity. The response rate to Question 8 is provided in Table 4. 10.

**Table 4. 10: Response rate to Question 8**

Question 8	FDET N=40	FHOR N=7	FMC N=29	IS N=30	<b>All schools N-106</b>
In your school computers are used ...	21	7	28	28	<b>84</b>
* For learning about computers	53%	100%	97%	93%	<b>79%</b>
* For learning in other subjects					
* As an extra-mural activity					

The total number of responses to Question 8 was 79%. The high response rate may seem to suggest that there is extensive integration, but a closer analysis of the categories indicates that this is not necessarily so. Figure 4.6 reflects how the learners report that they integrate ICT within the curriculum. They had to tick from the stated three categories namely, for learning about computers; for learning other subjects; and/or as an extra-mural activity. This

categorisation was an attempt to identify to what extent computers were used as an isolated subject or integrated within the curriculum.



**Figure 4 .6 Extent of integration of computers within the curriculum**

Those learners who have the opportunity to use ICT seemed to use it mostly for learning ‘*about*’ computers in other words as an isolated subject. Forty-four percent of the FMC and Independent Schools, 36% of the FHOR and 29% of the FDET learners report using ICT for computer literacy or programming. However, as Lim (2002) suggests, “ICT does not exist in isolation: it is interwoven with the rest of the tools and participants in the learning environment” (2002:411). Thirty seven percent of the Independent Schools’ learners claimed to use computers for learning other subjects, while only 21% and 25% of learners from the FDET and FMC schools respectively, report using ICTs for learning other subjects. This suggests that there is limited integration of ICT within other learning areas or subjects. Thirty seven percent of learners from the FDET schools did not respond, so it would appear that they don’t have sufficient opportunity to use ICTs, which is probably due to their inadequate access to computers mentioned earlier.

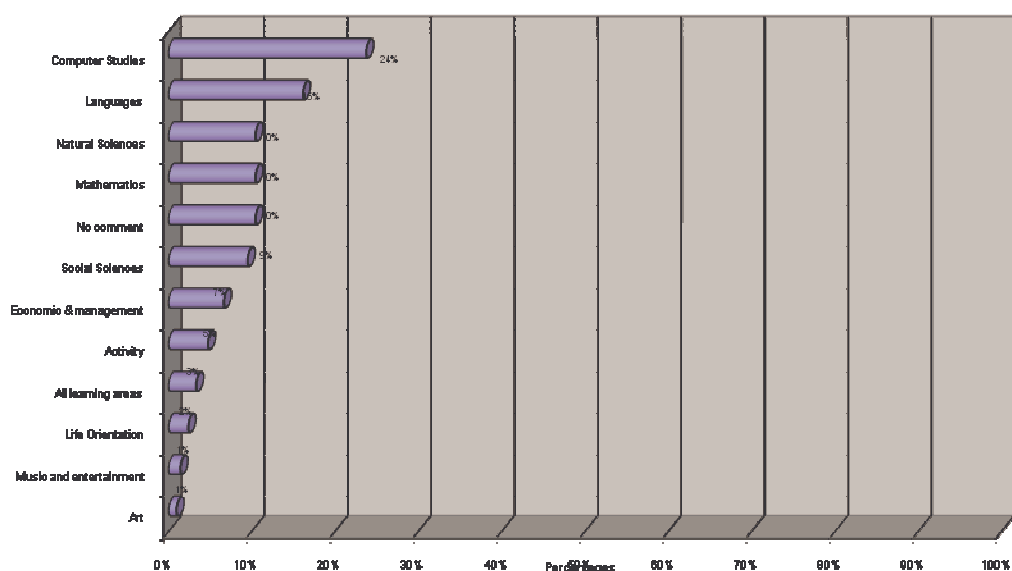
#### 4.7.2 Learning subjects or subjects in which learners use computers most frequently

The other important aspect that I investigated was the variety of learning areas or subjects in which the learners say they use ICT. This was the ninth question of the questionnaire where learners were expected to write down the different learning areas or subjects in which they use ICT to learn. The overall percentage of responses for this question is 74% (Table 4. 11).

**Table 4. 11: Learning areas/subjects in which learners use computers**

Question 9	FDET N=40	FHOR N=7	FMC N=29	IS N=30	All schools N=106
In which learning areas/subjects do you use computers?	22 55%	6 86%	24 83%	26 87%	<b>78</b> <b>74%</b>

The next graph illustrates the use of computers within the different learning areas or subjects as indicated by learners from all the different groups of schools i.e. FDET, FMC, FHOR and IS (Figure 4.7).



**Figure 4.7 ICT use in learning areas or subjects for all schools – Questionnaire data**

The graph shows that while ICT is not exclusively used in learning areas as Computer Studies, it seems to be the one in which ICT is mostly used for learning (24%). This probably means that learners are being taught more *about* computers than using computers *within* other learning areas. It seems that only 16% of learners use ICT for learning languages while only 3% of learners claim that they use ICT for learning in all the learning areas.

Use of computers in other subject areas is also minimal with learners overall reporting only 10% use in the Natural Sciences and Mathematics and only 9% in the Social Sciences and 7% in the Economics and management subjects. This suggests that there is fairly limited integration of ICT in all learning areas or subjects.

#### **4.7.3 Learners views on what teachers should ask them to do with computers**

In an attempt to establish what learners thought were valuable uses of ICTs in the curriculum, I endeavoured to address the question: What do learners think teachers should be asking them to use computers to do? The overall high response rate (92%) indicates that learners have definite opinions on this matter (Table 4. 12).

**Table 4. 12: Response rate to Question 12**

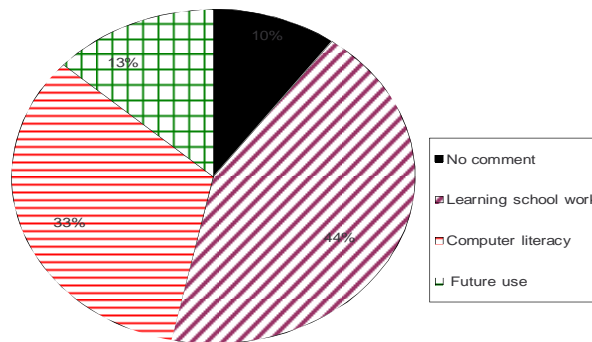
Question 12	FDET N=40	FHOR N=7	FMC N=29	IS N=30	<b>All schools N=106</b>
Why do you think teachers should give learners work to do on computers?	33 83%	7 100%	28 97%	29 97%	<b>97 92%</b>

Once again the FDET schools have the lowest response rate as they probably have insufficient experience of using ICTs in the curriculum to know for what activities they would like a teacher to ask them to use ICTs. The next table illustrates the answers given by learners to Question 12. Their responses have been grouped according to the most commonly occurring to the least frequently occurring theme (Table 4.13)

**Table 4. 13: Themes from Question 12**

Theme	Number of responses
Computer literacy	51
Future use	15
Neat and tidy work	8
Used worldwide	7
Easy and accessible	6
Skills development	5
More knowledge	5
Research	5
Learning more interesting	5
Typing and designing	4
Modern technology	3
Quick	3
Like to work on computers	2
Learn subjects using computers	2
Used in the business world	2
Cope with school work	1
Communication	1
More understanding	1
Projects and assignments	1
Better concentration	1
Willing to learn individually	1
Updated	1

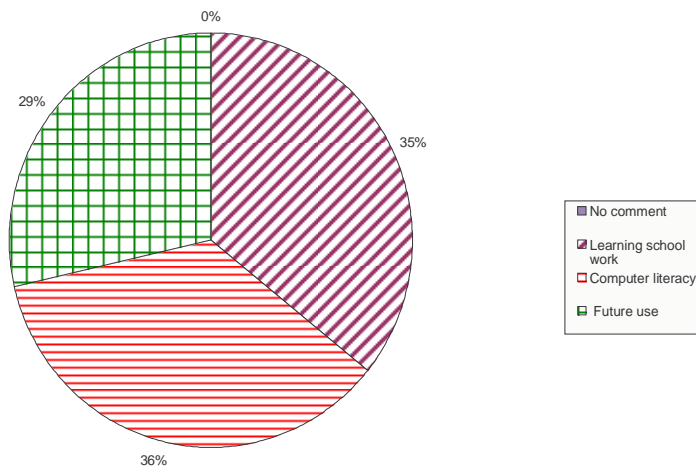
Across all four schools the most frequently suggested purpose for using computers was to develop computer literacy skills. In order to highlight the differences, the responses to Question 12 have been analysed according to the type of school. Figure 4.8 graphically illustrates the FDET learners' perceptions of what their teachers should be asking them to use computers for.



**Figure 4.8 FDET schools learners' views on teacher requested ICT activities**

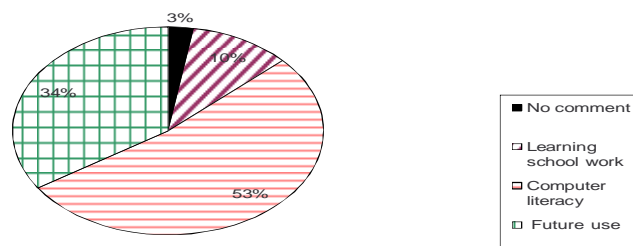
Forty four percent of the FDET learners seem to think that computers should be for learning schoolwork and 33% seem to see computer literacy as another important aspect. Once again 10% of the learners did not respond and this might be an indication of limited knowledge they might have about computers. Only 13% of the learners think computers might be good for future use. The availability of a sufficient number of computers and ability to use computers might assist learners in perceiving ICT use differently.

The next data from the FHOR school learners might be misleading as the questionnaires were only completed by seven Grade 11's (Figure 4.9).



**Figure 4.9 FHOR school learners' views on teacher requested ICT activities**

Thirty six percent and thirty five percent of FHOR learners prefer to use computers for becoming computer literate and learning schoolwork respectively. Only 29% of the learners seem to think computers would assist them in the future. Figure 4.10 shows what the FMC schools' learners think they should be asked to do on computers.

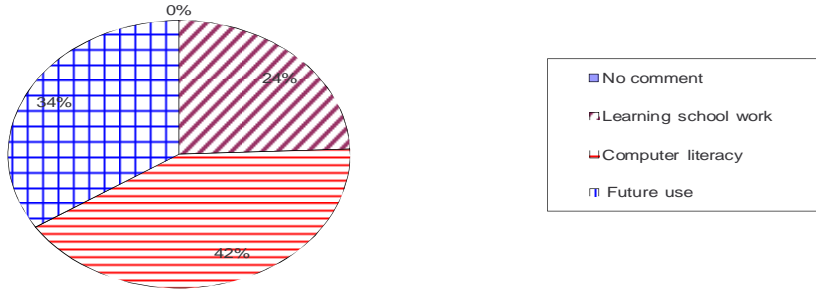


**Figure 4.10 FMC schools learners' views on teacher requested ICT activities**

The most popular response (52%) from the FMC school learners was about being computer literate. A response rate of (34%) suggests that learners believe that computers are also important for future use. Only 11% of the learners would like to use computers for learning

schoolwork and 3% of the learners did not comment. These results might be due to the fact that most learners of these schools are exposed to computers and have first hand experience of using computers hence most of them view computer literacy as the most important aspect. The concern is that only 11% of the learners would like to use computers for learning school work and so the assumption is that these learners are not encouraged to do so. It would therefore be of importance for teachers to use computers for teaching in the different learning areas so that learners see the value of using computers for schoolwork.

Figure 4.11 reflects the perceptions Independent Schools’ learners have about what the teachers should request them to do on computers. The response rate for this question is 100%.



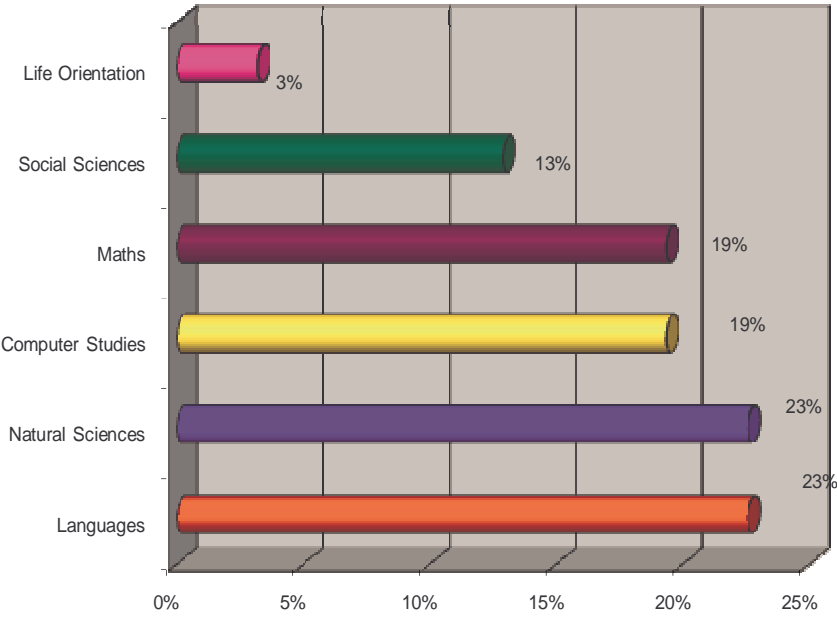
**Figure 4.11 Independent Schools learners’ views on teacher requested ICT activities**

There are 42% of the learners from Independent Schools who seem to think computer literacy is important. The future use of computers seems to be supported by 34% of the learners compared to the 24% who seem to consider using computers for learning school work to be valuable. These results might be due to the fact that most learners in these schools have first hand experience of using computers hence most of them view computer literacy as the most important aspect.

The issue of ICT integration in the curriculum was revisited in the focus group interviews, indicating a similar pattern of limited computer use within learning areas/subjects. In answer to a series of questions in the focus group interviews (Questions 4-9), using Excel to help me

capture and group their responses I was able to establish that overall learners use computers predominantly for the language learning areas or subjects and for Natural Science.

The next graph illustrates the data from all 12 focus group interviews conducted at the 5 FDET, 3 FMC, 3 IS and 1 FHOR schools indicating how learners overall say they use computers for learning the different learning areas (Figure 4.12).



**Figure 4.12 ICT use in learning areas or subjects for all schools – Interview data**

According to the focus group interviews, 23% of the learners seem to use computers for learning both Languages and Natural Sciences. This is the highest percentage and this perhaps shows the subjects in which ICT integration is occurring most frequently in schools. Unlike with the questionnaire data, Computer Studies seem to be rated alongside Mathematics as 19% of the learners say that they use ICT for also learning each of these two learning areas. Only 3% of the learners use ICT in Life Orientation which is similar to what the questionnaire data revealed. These findings across all four types of schools clearly indicates that there is some degree of ICT integration within all learning areas, but that it varies between 3%-25% for the various learning areas.

The next section addresses the question of the value of using ICT in learning areas or subjects.

**4.8 Benefits of ICTs as perceived by learners**

This section consolidates the learners’ perceptions of the actual or potential benefits of integrating ICTs into the curriculum and draws on data from the questionnaires and the focus group interviews. Question 11 was an open question where learners had to state why they think it is worthwhile to use computers in learning areas or subjects. Table 4. 14 provides the overall response rate (92%) to this question, which suggests that learners had a lot to say and are quite knowledgeable of the benefits of integration of ICT into the curriculum, irrespective of their access to computers on a regular basis.

**Table 4. 14: Response rate to Question 11**

Question 11	FDET N=40	FHOR N=7	FMC N=29	IS N=30	All schools N=106
What are the learners’ perceptions of the actual or potential benefits of integrating ICT into the curriculum?	33 83%	7 100%	28 97%	30 100%	98 92%

I have used Hawkrigde’s (1990) categories to attempt to analyse the perceptions that the learners seem to have about the actual or potential benefits of integrating ICT into the curriculum. Table 4. 15 shows the rate of response from all the schools in each category.

**Table 4. 15: Learners’ perceptions of the actual or potential benefits of integrating ICT into the curriculum**

School Group	No comment	Social	Catalytic	Pedagogic	Vocational
<b>FDET</b>	14%	28%	36%	14%	8%
<b>FHOR</b>	0%	13%	31%	6%	50%

<b>FMC</b>	5%	40%	36%	12%	7%
<b>IS</b>	0%	24%	21%	1%	54%

Fifty four percent of the learners in Independent Schools followed by 50% in the FHOR school seem to think that computers are a good foundation for them to find satisfactory employment when they leave school. However, neither learners from the FDET schools (8%) nor the FMC schools (7%) seemed to consider that the use of ICTs at school had any vocational benefits.

Forty percent of the learners' comments from FMC had to do with the awareness of learners of how computers work and this, according to Hawkrige (1990) is the use of computers for a Social Rationale. The FDET and Independent Schools' learners shared a view on the social value of ICTs with scores of 28% and 24% respectively. The FHOR school learners were not as enthusiastic about the social value of ICTs as the other groups of learners with only 13% of their comments indicting issues related to Hawkrige's (1990) Social Rationale.

While the data could possibly be analysed in different ways, it would seem that 36% of the comments that both FDET and FMC learners made had to do with using ICT to "move away from rigid curricula, rote-learning and teacher-centred lessons by giving more control to the learner" (p3) – in Hawkrige's words - the Catalytic Rationale. The comments from the FHOR school learners and those from the Independent Schools indicated that they seemed to be less convinced about the value of ICTs to encourage educational changes with 31% and 21% respectively.

Perhaps the most surprising of all was that less than 15% of the comments from all the groups of schools had to do with the use of computers within the curriculum, what Hawkrige (1990) refers to as the Pedagogic Rationale. This seems to indicate that learners are not convinced about computers as a pedagogic tool which is congruent with the rest of the findings that reveal the limited integration of ICT is within the curriculum.

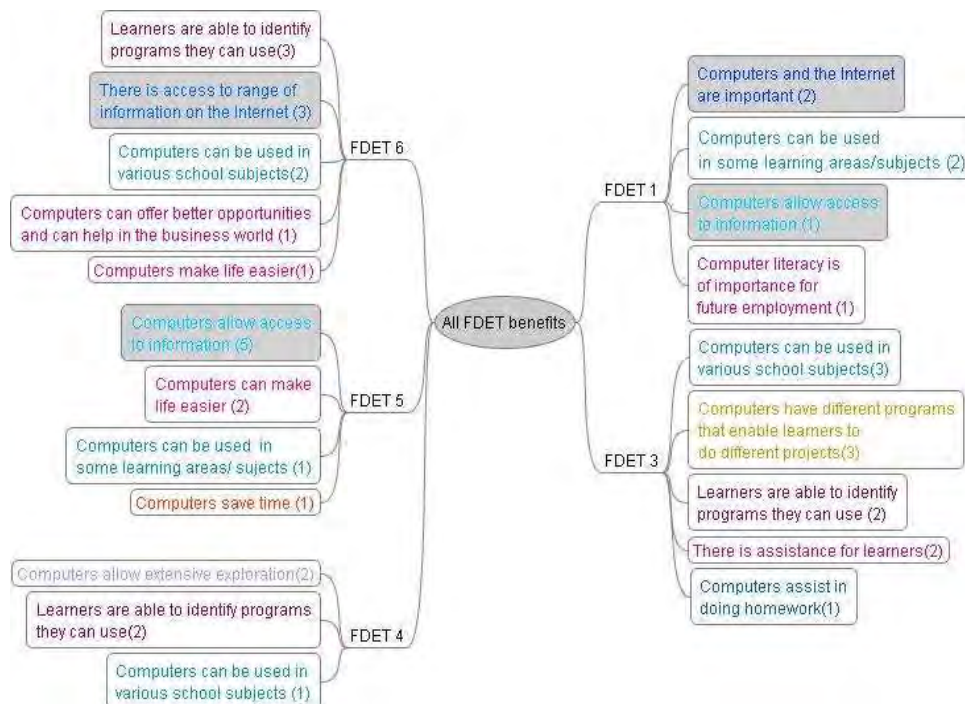
The following mind maps and tables are drawn from the responses during the focus group interviews and focuses on the benefits of computers as perceived by learners from 5 FDET schools, 1 FHOR school, 3 FMC schools and 3 Independent Schools.

### 4.8.1 Benefits for the FDET schools

The discussion of the FDET learners’ perceptions of the benefits of ICTs is supported by the mind-maps (Figures 4.13 – 4.16) that were used to group emerging themes from the focus group interview transcripts. Figures 4.13 - 4.16 are intended to be a set of figures differentiated by grey shading to indicate the current category of benefits for the particular group of schools being discussed – in this case the FDET schools. The category of benefits are arranged from those most frequently occurring comments to the category of comments made least often.

#### 4.8.1.1 Value of the Internet to access information

The most frequently occurring comment centres on the value of having Internet access. Learners from FDET 1 (3 comments) and FDET 5 (5 comments) both strongly agree that computers allow access to information. This is echoed by FDET 6 learners who are of the view that computers allow access to a range of information on the Internet (3 comments) (Figure 4.13).

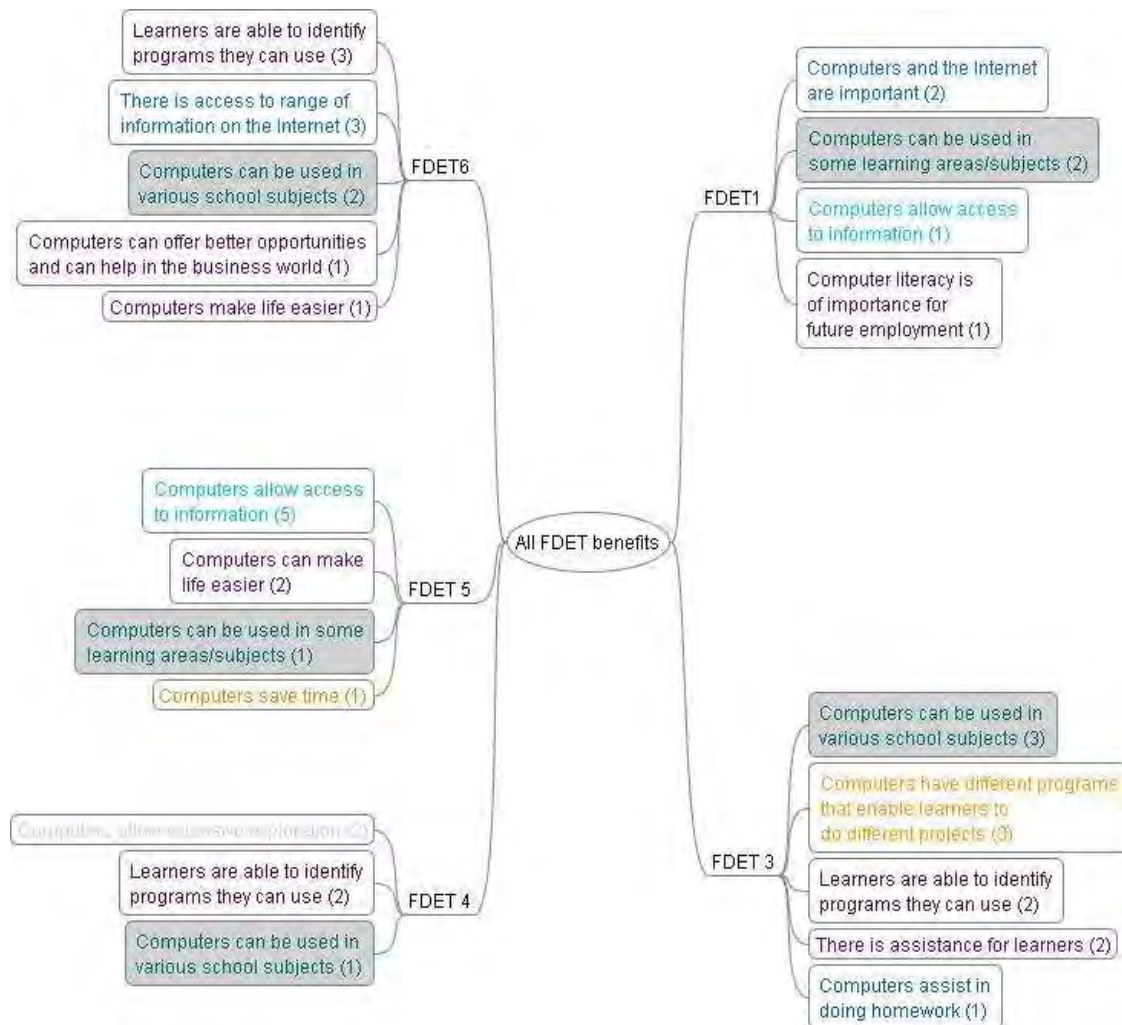


### **Figure 4.13 FDET Benefits mind-map: Use of ICT for information access**

The comments that these learners have made show that they perceive computers, and specifically the Internet, as a source of information they don't have the opportunity to access in other ways. Learners seem to know the value of the Internet and how it can assist them in their learning even those learners who do not have access to computers. However, these learners seem to have a very general concept of "information" as they don't really specify what type of information they will have access to when using computers. Learners from the FDET schools had something to say about the "information", "*Sometimes most of the information we get from the library is from newspapers and sometimes things like short story books and you feel that the information is not enough at least computers have more information*" (FDET 5), "*You can use search engines from the Internet to find information*" (FDET 4), "*Like the Internet there are sites that you can look at and get the information that you need, like ja it depends on what you are looking for*" (FDET6)".

#### ***4.8.1.2 Value of using ICTs within the curriculum***

The second most frequently recorded comment, and one that was made by every FDET school, albeit in slightly different ways, was about the value of the use of ICTs within the curriculum. The learners from the FDET schools seem to perceive computers as being a tool that can be used for the various school subjects/ learning areas. This is shown by the number of responses (9 comments) from the five FDET schools. Of the 9 comments 3 are from FDET 3; FDET 1 and FDET 6 provide two comments each; while the FDET 4 and FDET 5 provide only 1 comment each (Figure 4.14).



**Figure 4.14 FDET Benefits mind-map: Use of ICT within curriculum**

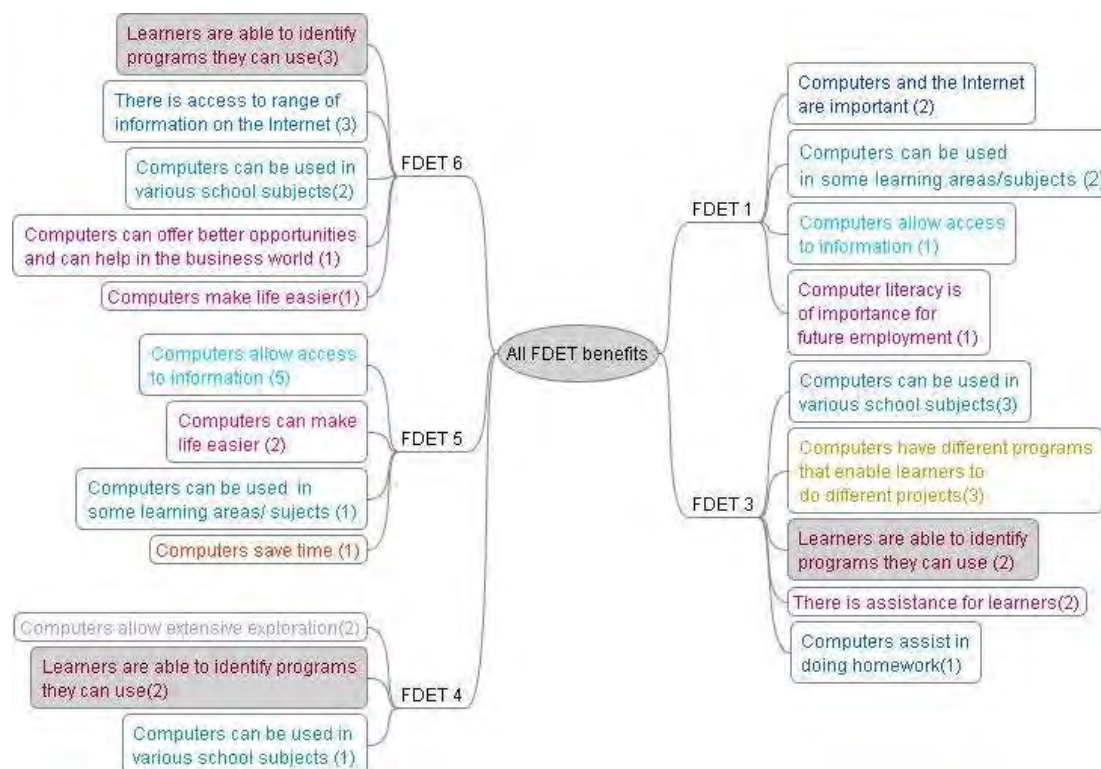
A possible explanation for the response from FDET 3 school is that it currently has computers that are, to a certain extent, used by the learners for learning the various school subjects/ learning areas. For FDET 1 and FDET 6 schools, there are 2 comments for each, even though the majority of their learners do not have access to computers. Some of the learners, whom I interviewed from the FDET 6 school, have had the opportunity to work on computers somewhere else but not at their present school. Understandably, the schools with only 1 comment each are the schools where learners have no access to computers at all.

While FDET learners overall have limited access to computers, those who have access comment specifically about the value of integrating computers into their subjects or learning areas. Even the learners who do not have access to computers see the value of using them within the curriculum. In the light of these comments, it would seem that the learners see the value of integrating ICT within the curriculum, whether they currently have access to ICTs or

not. This is confirmed by one of the learners from FDET6 who said, “*I think computers have lots of information that our schools do not have and we also do not have facilities for doing physics experiments. Like if you use a computer you see with your own eyes the whole process and be able to recall it during exams but if you are told by someone else that this and that is like this, you will never recall that when it is exam time. Maybe we would benefit more on computers*”.

#### 4.8.1.3 Value of software knowledge and skills

The third most frequently occurring comment is about software knowledge and skills. In Figure 4.15 three of the FDET schools FDET 3, FDET 4 and FDET 6, learners seem to have knowledge about the computer programs they can use (7 comments).



**Figure 4.15 FDET Benefits mind-map: Use of computer programs**

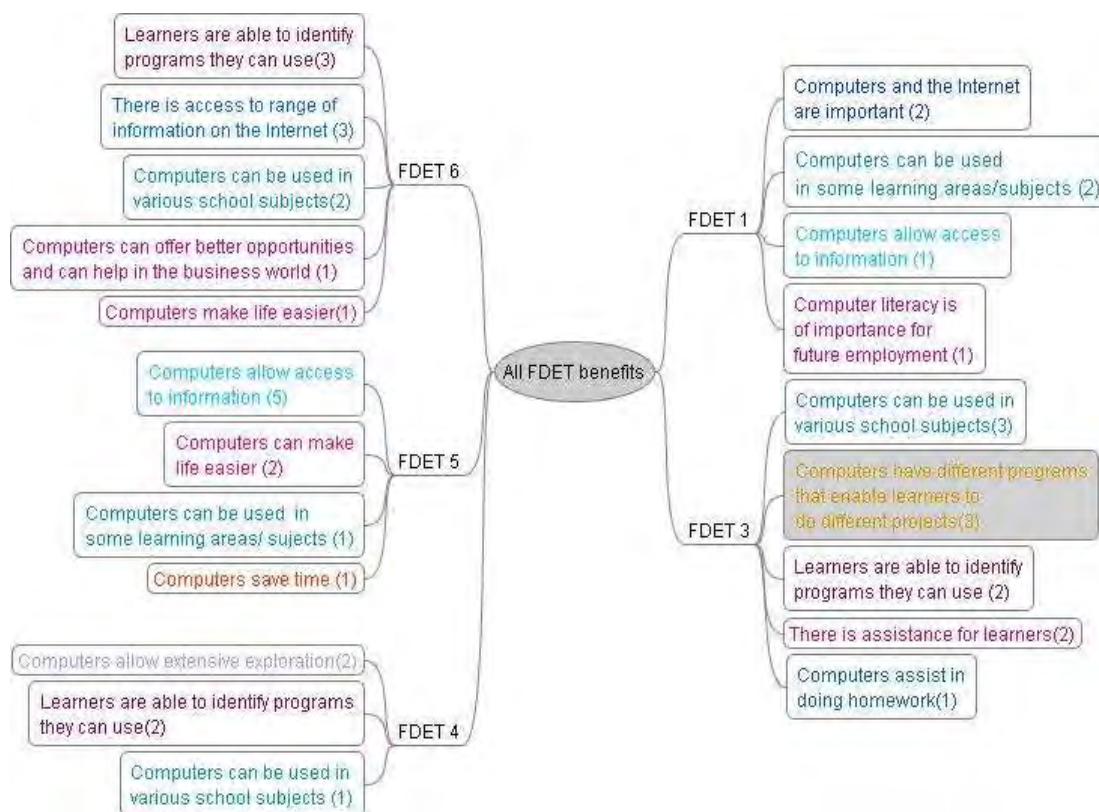
Surprisingly, the school with the most comments (3 comments) is FDET 6, even though they don't have computers at all at their school. A possible explanation for this is that the three comments only mention one program (*MS Word*), which means that they have only been exposed to 'representational' (Hokanson & Hooper 2000) use of computers. FDET 3 and

FDET 4 both provide 2 comments each, while the other two FDET 1 and FDET 5 schools did not comment at all. Learners from FDET 3 mention *Microsoft Publisher* and *Dream Weaver* whilst FDET 4 learners mention *Microsoft Word* and search engines from the Internet as programs they can use. During the focus group interviews, learners from FDET 3 did not only mention the programs they can use, but could link them to how they use them. For example, one of the learners said, “*Dreamweaver is a program that we use to design our websites*”. The absence of comments from FDET 1 and FDET 5 suggests that the learners from these schools have no access to computers hence they are unable to identify computer programs.

From the questionnaire data (Question 7), learners from FDET 3 could clearly distinguish between the different computer programs they can use for their learning. They specifically mentioned *Dreamweaver*, *Paint*, *Microsoft Word*, *MS Power point*, *Macromedia Fireworks*, *Track Programs* and *MS Excel*. This is somewhat in contrast to the interviews where only three learners indicated specific knowledge and skills about the use of computer programs. Five learners have shown no knowledge of how to utilise computer programs for their learning. Learners might be expressing their willingness to integrate ICT within the curriculum but, it is clear that possibly their limited knowledge about the computer programs, could be a barrier for them to use computers for their learning.

#### ***4.8.1.4 Value of using ICTs for projects***

The fourth category of comments is about how the different computer programs enable learners to undertake different projects. The 3 comments were provided by the FDET 3 school learners only (Figure 4.16).



**Figure 4.16 FDET Benefits mind-map: How computer programs are used**

A possible explanation for this is that the FDET 3 school learners are the only learners in the FDET schools who have access to computers at school. These learners are able to name and use different computer programs for different purposes. During the focus group interviews, the FDET 3 school learners demonstrated extensive knowledge and explanations about the programs they use for their projects. For example, one learner proudly said to me:

*“For me, there is a new program that I use without asking for anybody’s assistance and that makes me happy because I can work on my own and do my work without bothering anybody”.*

This particular learner was referring to *Microsoft Publisher*.

It is clear from these comments that specific explanations of how to use computers for projects only emerges once learners have access to computers. It is therefore of importance that learners be exposed to the different programs to be able to identify and more importantly to use them so that they can see them as ‘tools’ that can assist them in undertaking the different learning activities.

## 4.8.2 Benefits for the FHOR school

There is only one FHOR school and therefore there will be no comparison as it is the case with other schools.

### 4.8.2.1 Value of using ICTs within the curriculum

The most frequently mentioned comments deal with the use of ICTs within the curriculum as well as the identification of the different programs that the learners can use, with 4 comments for each.



**Figure 4.17 Benefits mind-map: Use of ICT within curriculum & programs used**

A possible reason for this might be that these learners are only familiar with those programs that they use for their specific subjects. For example during the focus group interviews one of the learners mentioned a program that his teacher introduced to them. He specifically said: “There’s another program that our *technology* teacher introduced to us. It’s a program like you complete a circuit board you take a battery connect it with wires to the bulb then try to light it then you have a battery and connect it to the bulb and make a switch and connect it to the bulb and then light goes on” (FHOR L1). This is most likely to be *Crocodile Clips*, but the learner clearly does not know the name of the software even though he clearly understood its function.

Of the 7 learners who completed the questionnaires, 3 mention that they have used computers as an extra mural activity whilst another 3 state that they use computers for learning subjects such as English, Maths, Afrikaans and History and one learner states that he/she doesn’t use computers in any of the subjects.

These findings do not provide a consistent picture across the focus group interviews and questionnaire data. Possible reasons for this might be that the questionnaires were completed by the grade 11s only whilst the interviews were conducted with learners ranging from grades 8 to 11.

**4.8.2.2 Value of using ICTs for information access**

The comments that two learners have made show that they perceive computers as a valuable source of information.



**Figure 4.18 Benefits mind-map: Use of ICT for information access**

Learners seem to recognise the value of the Internet and how it can assist them in their learning. During the focus group interviews one of the learners specifically said that: *“Sometimes like some stuff you get from the Internet is like some terms you haven’t heard before and like sometimes is like helpful like there are some terms on the Internet that people don’t like usually use”* (FHOR L2).

**4.8.2.3 Value of using ICTs for recreational purposes**

Learners from the FHOR school seem to perceive computers as a ‘tool’ that can also be used for recreational purposes.



**Figure 4.19 Benefits mind-map: Using ICTs for recreational purposes**

A possible reason for this maybe that these learners have access to computers both at home and at school [though limited] and they can use them for learning and other purposes. During the focus group interviews learners mentioned that “*Music like downloading music to cds and playing games*” [FHOR L 1], “*We use computers at home [because] the software that they [the school] use it sucks*” [FHOR L 2].

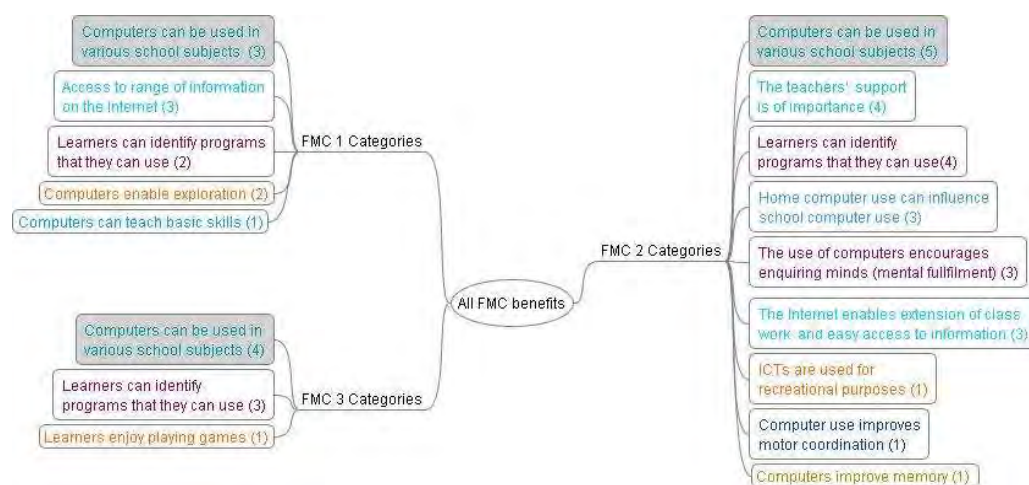
The questionnaire data correlates quite well with the focus group interviews comments as 5 of the 7 learners who completed the questionnaires have mentioned that they use computers for entertainment.

### 4.8.3 Benefits for the FMC schools

The next discussion is based on the learners’ perceptions of the benefits of ICT and the different themes that emerged from the focus group interviews. The mind-maps have been used to support the discussion of these themes and so Figures 4.20-4.24 indicate the benefits for FMC schools.

#### 4.8.3.1 Value of using ICTs within the curriculum

The most frequently occurring comment from the three FMC schools deals with the use of ICTs within the curriculum. Learners from all the FMC schools seem to recognize computers as being an important tool to be used for their learning, as 12 comments directly involve computer use in various school subjects. Of the twelve comments 5 are from the FMC 2 school; 4 are from FMC 3 and 3 are from FMC 1 (Figure 4.20).

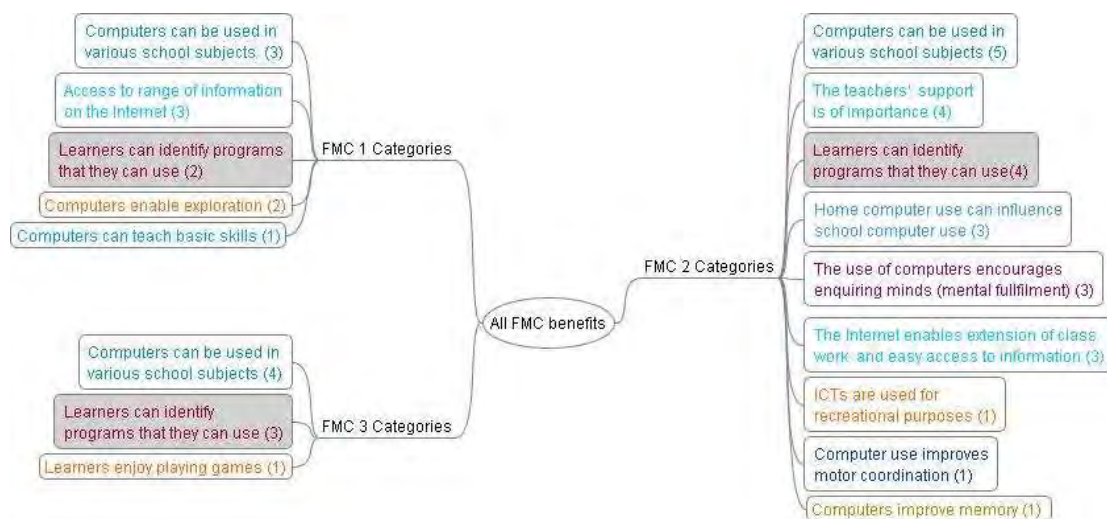


**Figure 4.20 Benefits mind-map: Use of ICT within curriculum**

Learners from all the FMC schools have access to computers and have the opportunity to use them to support the various learning areas or subjects. The FMC 2 learners made the most comments and a possible reason for this might be that these learners have positive attitudes towards the use of computers within the curriculum, as was evident in their optimistic responses during the focus group interviews. In these focus group interviews most of the learners mentioned Information Technology, Computer Science, Computer Literacy, as the main subjects that allow them to use computers, and International Computer Driving License (ICDL) which is a curriculum for computer literacy. The learners claimed that the skills they acquire are then integrated in other learning areas or subjects. These comments give the impression that learners from the FMC schools are willing to integrate ICT within the curriculum. One learner from FMC2 said, “*most of the textbooks that we use are a bit outdated so if you do research on the Internet when you use computers you get more recent material on that subject that you are trying to get information out*”.

**4.8.3.2 Value of software knowledge and skills**

The second most frequently occurring comment centres on FMC learners’ software knowledge and skills. The FMC 2 school made 4 comments, FMC 3 made 3 comments and FMC 1 made 2 comments (Figure 4.21).



**Figure 4.21 Benefits mind-map: Use of computer programs**

It was rather disappointing to discover that learners from the FMC 3, even though they have 62 working computers (Brandt 2006) in their school, are not adequately exposed to the use of computers hence they were unable to mention the range of programs available to them. This is to some extent in contrast with what the learners from the FMC3 had to say on the questionnaire data, as all ten learners who responded were able to identify programs they can use. Another possibility is that the learners who completed the questionnaire were not the same learners who participated in the focus group interviews as explained in Chapter 3. During the focus group interviews, the learners from FMC 3 stated that in some of the subjects where they use computers, there is high level of confusion. For example, the learners claimed that those who do *CAMI Maths* say that they come to the lab wanting to know answers, but instead they leave more confused. The shallow knowledge that learners have about computers might be a source of minimal computer use within the curriculum. A possible reason for this might be that the learners do not get the necessary support they need in using computers, as was mentioned in the focus-group interview. Another possibility might be that there is a ‘belief’ around ‘girls and computers’; where girls are perceived as not being ‘good’ at using computers leading to the loss of interest in attaining satisfactory knowledge and skills. Scheckelhoff states “Research continues to reveal that girls are not as attracted to, or as skilled with, computers as boys ...” (2006:54).

On the other hand learners from FMC 1 were able to list various programs and how they can use some of them. These programs are *Microsoft Excel*, *Microsoft Word*, *Encarta*, *Microsoft Publisher*, and *Microsoft PowerPoint*. During the focus group interviews when I asked how they use these programs, one of the learners specifically said, “*Like Power Point for presentations and word processing we use Word*” (FMC 1 L1).

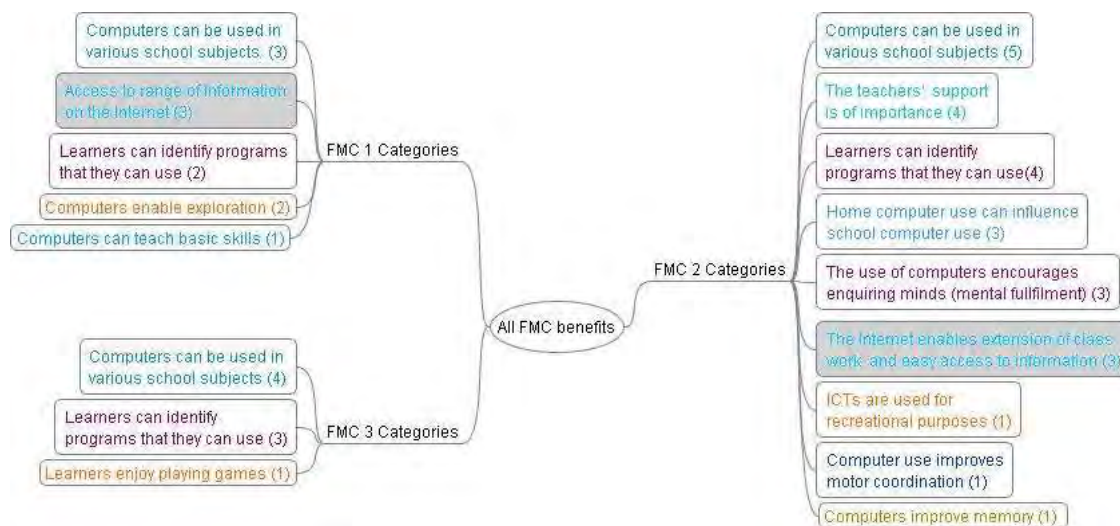
Likewise learners from FMC 2 clearly show the depth of knowledge they seem to have, as they are capable of identifying programs that are easy or complicated to use. During the focus group interviews, one learner claimed that, “*excel is much easier but power point is sometimes difficult*” (FMC 2 L1).

These findings do not provide a consistent picture across the FMC schools. At two of the FMC schools learners seem to show eagerness to integrate ICT within the curriculum, as most

of them are able to use the computer programs for their learning, while at the third FMC school, the learners display a rather superficial grasp of which programs they could use for what purpose.

#### 4.8.3.3 Value of the Internet to access information

The third most frequently recorded comment concerns the value of Internet access. Learners from FMC 1 and FMC 2 made 3 comments each, but the issue was not raised at all by the learners at FMC 3 (Figure 4.22).



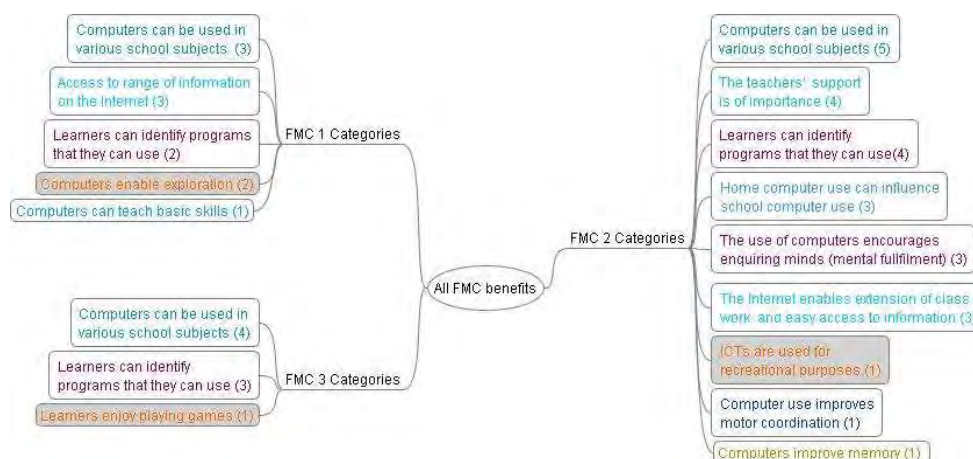
**Figure 4.22 Benefits mind-map: Use of ICT for information access**

Learners from FMC 1 and FMC 2 both perceived computers as the source of information and seemed to know the value of the Internet and how it can assist them in their learning. FMC 3 learners did not comment at all and a possible explanation might be the lack of interest or skills in using computers to find information. Again, this is in contrast with what FMC 3 learners recorded in the questionnaires (Question 6), where nine out of ten learners at FMC 3 indicated that they have used computers for research. Once again, the lack of consistency between the questionnaire and the interview findings could be attributed to the different groups responding to the questionnaires and interviews.

In general FMC schools' learners seem to have a very general notion of 'information', as they do not specifically reveal the kind of information that is at their disposal for learning purposes on the Internet. During the focus group interviews one learner from the FMC 1 mentioned that there is “*general knowledge from the Internet*” (FMC1 L2). It has been my experience that many learners erroneously think that the Internet provides access to almost anything that they would search for. As one learner said, “*Basically you can find anything*” (FMC1 L3).

#### 4.8.3.4 Using ICTs for recreational purposes

The fourth most frequently occurring comment concerns the use of ICTs for exploration and recreational purposes. Two comments were made by the FMC 1; FMC 2 and FMC 3 made one comment each (Figure 4.23).



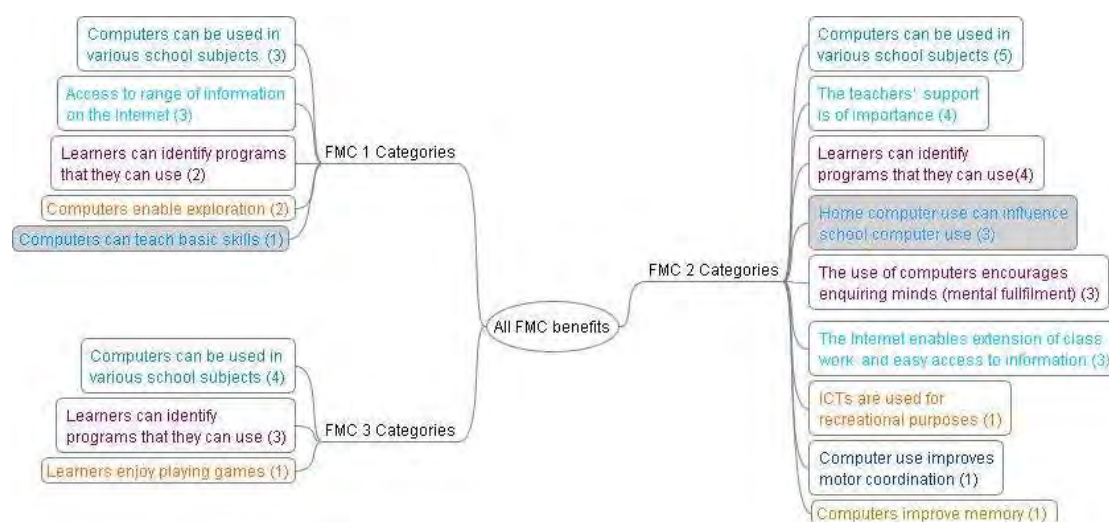
**Figure 4.23 Benefits mind-map: Using ICTs for recreational purposes**

Learners from all FMC schools seem to perceive computers as a 'tool' that can also be used for recreational purposes. A possible reason for this maybe that these learners have access to computers both at home and at school and that they can use them for learning and other purposes. During the focus group interviews one learner from FMC 1 mentioned that, “... *because you get bored of using what you normally use, you need to explore*” (FMC1 L4). It would seem that learners aspire to use computers in a more informal manner where they can explore according to their specific interest. As a learner from FMC 2 stated that, “*At home you fool around the computer using the Internet [to] look for stuff, you can download music*” (FMC2 L3). Likewise, learners from the FMC 3 seem to be comfortable with using computers

for recreational purposes as they mentioned during the focus group interviews that, “... it’s like we are comfortable with computers because some of us love computer games and like you know I think it’s because it’s brighter ...” (FMC3 L1) This view is consistent with the data from the questionnaire, which indicated that all 29 learners from the three FMC schools have used computers for entertainment (Question 6).

#### 4.8.3.5 How basic computer skills can influence school computer use

The fifth most frequently documented comment centres on how basic computer skills can influence school computer use. The FMC 2 learners provided three comments whilst the FMC 1 learners made only one comment (Figure 4.24).



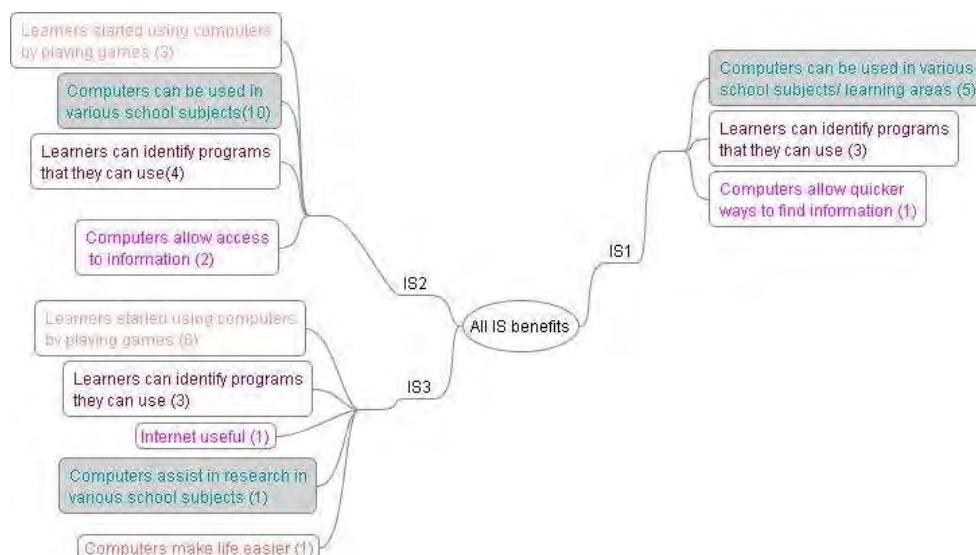
**Figure 4.24 Benefits mind-map: How basic computer skills can influence school computer use**

Once again learners from the FMC 3 did not comment at all. A possible reason for these learners not responding might be their minimal use of computers. On the other hand, learners from FMC 1 and FMC 2 both link basic computer skills with school work. For example, during the focus groups, one learner from the FMC 1 claimed that “... at school they don’t have to teach you basic stuff ... you have a foundation how to get there so you have a basic you don’t have to start from scratch” (FMC1 L5). One learner from the FMC 2 added that, “Using computers at home improves your skills at school because you get the opportunity to practise” (FMC2 L4). Data from the questionnaires (Question 2) reinforces the above view

because 26 of the 29 learners clearly indicated that they have used computers both at home and at school.

#### 4.8.4 Benefits for the Independent Schools

The most frequently occurring comment deals with the use of ICTs within the curriculum. Learners from all the Independent Schools (IS) seem to be aware of computers as being a key tool to be used for their learning, because 16 of the comments made specifically deal with computer use in various school subjects. Of the sixteen comments 10 are from IS 2; 5 are from IS 1 and 1 from IS 3 (Figure 4.25).



**Figure 4.25: Benefits mind-map: Use of ICT within curriculum**

Since learners from IS 2 & IS 3 have access to 170 and 235 (Brandt 2006) working computers respectively, there is a strong possibility of using them in the various school subjects/learning areas. Learners from IS 2 and IS 3 made comments during the focus group interviews that imply that they actually use computers in most of the subjects in the curriculum. For example, three learners from IS 2 specifically stated that, “I ... spend most of my time doing physics research (IS Learner 1), “I think geography is probably the most [appropriate]”, “But it’s also English and Afrikaans essays ... (IS Learner 2)” “I have an accounting project coming up so I’ll probably use it” “we go to the labs because there is a Xhosa program on there and you do grammar and all those kinds of things on the computer”, I think subjects like ... [not

*clear on audio recording] and chemistry*". "I do computers as a subject" [Computer Science] (IS Learner 3). Similarly, in response to the questionnaire, they mentioned the same subjects as above, but included others, such as Music, History, Biology, and Art. In the same way, learners from IS 3 also made comments during the focus group interviews as they specifically said: "We've got like different types of programs for each subject like multimedia programs, multimedia science it's got all the different sections that you need and there's summaries ja of all sections (IS L4). Learners from IS 3 said they use computers for "most" subjects, but on the questionnaires they specifically mentioned subjects such as Afrikaans, Biology, Computer Science, English, French, Geography, History, Information Technology, Life Orientation, Music and Science. A possible reason for this disparity might be related to advantages of using questionnaires because learners took answered at their own pace without the presence of the researcher; and also had time to think about their responses as I have discussed in Chapter 3. Also, the time that they had with the questionnaires might have given them the opportunity to think extensively about the questions and maybe changed some of the answers compared to the instant answers that were required during the focus group interviews.

During the focus group interviews, learners from IS 1 mentioned only five subjects in which they use computers (Geography, English, History, Maths and IT), but listed ten subjects (Maths, IT, Geography, Science, History, L.O. [Life Orientation], English, Afrikaans, Computer Studies and Art) in their responses to Question 9 of the questionnaire. A possible reason for this discrepancy in responses might be that I was obliged to interview different learners from those who completed the questionnaires. Table 4. 16 presents in tabulated form, the different subjects within which learners from IS 1, IS 2 and IS 3 said they use computers in response to the questionnaire and during the interviews.

**Table 4. 16: Questionnaire and Interviews data on the use of ICT in subjects for IS 1, IS 2 & IS 3**

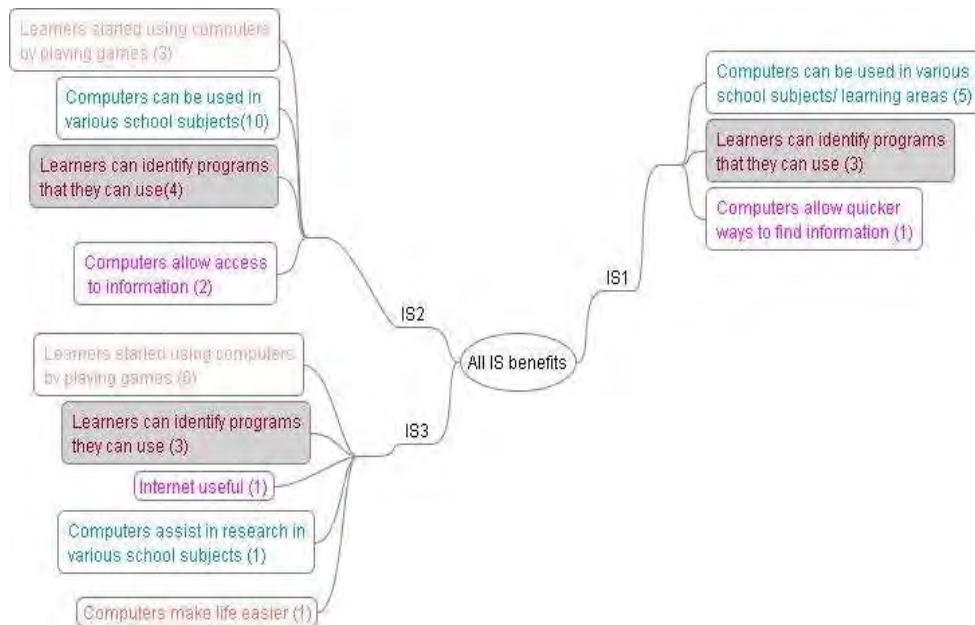
Subjects	IS 1		IS 2		IS 3		TOTAL
	Q	I	Q		I	Q	
Accounting				✓	✓		2
Afrikaans	✓	✓	✓	✓	✓	✓	6
Art	✓		✓				2
Biology	✓		✓			✓	3
Chemistry				✓	✓		2

Computer Science	✓	✓	✓	✓	✓	✓	6
English	✓	✓	✓	✓	✓	✓	6
French						✓	1
Geography	✓	✓	✓	✓	✓	✓	6
History	✓	✓	✓			✓	4
Information Technology	✓					✓	2
Life Orientation	✓					✓	2
Maths	✓		✓	✓	✓		4
Music			✓			✓	2
Science	✓		✓	✓	✓	✓	5
Xhosa			✓	✓	✓		3

These comments indicate the scope of ICT integration within the various school subjects. All learners from all IS schools indicate using computers in the languages subjects (English and Afrikaans), and Geography and Computer Science. The purposes for which they use computers (e.g. essays, grammar exercises, research) are elaborated upon in the next section.

#### ***4.8.4.1 Programs that learners can use***

The second most frequently occurring comment centres around programs that the learners can use. Learners from IS 2 made four comments whilst IS 1 and IS 3 learners made three comments each (Figure 4.26).



**Figure 4.26: Benefits mind-map: Use of computer programs**

Learners from IS 1, IS 2 and IS 3 have identified programs that they can use and how they use them. During the focus group interviews one learner from IS 1 stated that, “*Word is the most popular one like everyone is using it to write essays and some of us use Excel, I know I use it for like when I draw up a list*” (IS L6). Another learner also from IS 1 stated “*PowerPoint like [for] presentations, slide shows*” (IS L7). Similarly, from IS 2 one learner stated that, “*Mostly using Word to type out essays and to get info for projects*” (IS L8). Another learner stated, “*I used to use it [Encarta] for getting information and then putting it into ... for projects and like for science ....*” (IS L9) Also from IS 3, learners mention that: “*Word, it helped you being more neat in projects and ja*” (IS L10). Another learner added: “*As well as spelling*” (IS L11). One other learner also said: “*[We use PowerPoint for] slide shows and presentations and like that sort of thing*” (IS L12).

Data from the questionnaires (Question 7) illustrate that all thirty learners from the IS schools are able to identify programs they can use. Table 4. 17 clearly shows the variety of programs that learners from the three Independent Schools use for the different requirements and specific tasks.

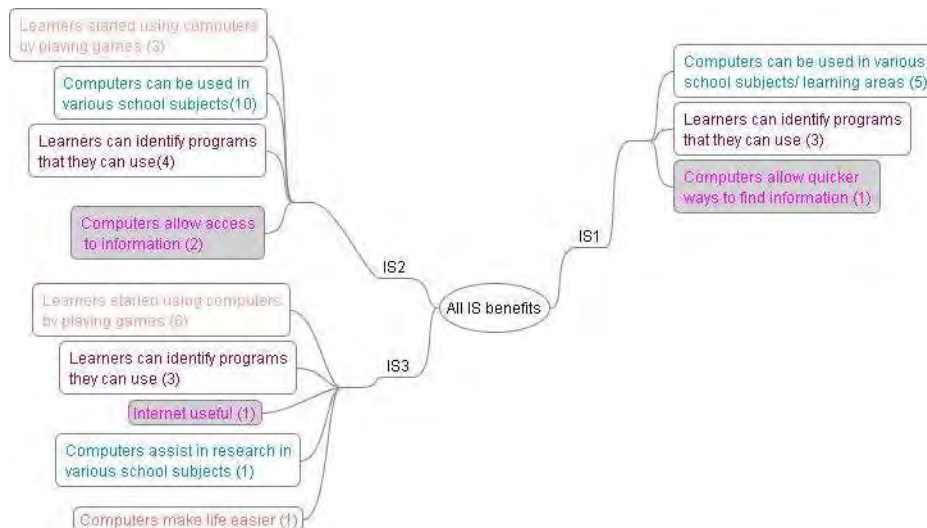
**Table 4. 17: Use of computer programs**

Type of software	IS 1	IS 2	IS 3
Word processing	<i>MS Word</i>	<i>MS Word</i>	<i>MS Word</i>
Design and publish	<i>MSPublisher</i>	<i>MSPublisher</i>	<i>MSPublisher</i>
Database management		<i>MSAccess</i>	
Drawing	<i>Paint</i>	<i>Paint</i>	<i>Paint</i>
Entertainment		<i>Media player</i>	
Communication		<i>MSOutlook</i>	
Spreadsheets	<i>MSExcel</i>	<i>MSExcel</i>	<i>MSExcel</i>
Presentations	<i>MSPowerPoint</i>	<i>MSPowerPoint</i>	<i>MSPowerPoint</i>
Design webpage			<i>MSFrontpage</i>
Encyclopaedia		<i>Encarta</i>	<i>Encarta</i>

According to the data in Table 4. 17, apparently all the Independent Schools' learners are familiar with programs such as *Microsoft Word*, *Microsoft Publisher*, *Microsoft Excel*, *Microsoft PowerPoint* and *Paint*. Learners from IS 2 seem to be using most of the computer programs that are at their disposal. On the other hand, IS 1 and IS 3 learners seem to mostly engage themselves with more [academic or school orientated work] programs. When considering the number of programs that IS learners have acknowledged, IS 1 seems to have a limited number of programs. A possible reason for this might be a 'belief' that girls are perceived as not being 'good' at using computers (Scheckelhoff 2006; Christensen, Knezek & Overall 2005).

#### **4.8.4.2 Value of Internet access**

The third most frequently occurring comment concerns the value of the Internet access. Learners from both IS 1 and IS 2 made 2 comments each (Figure 4.27).

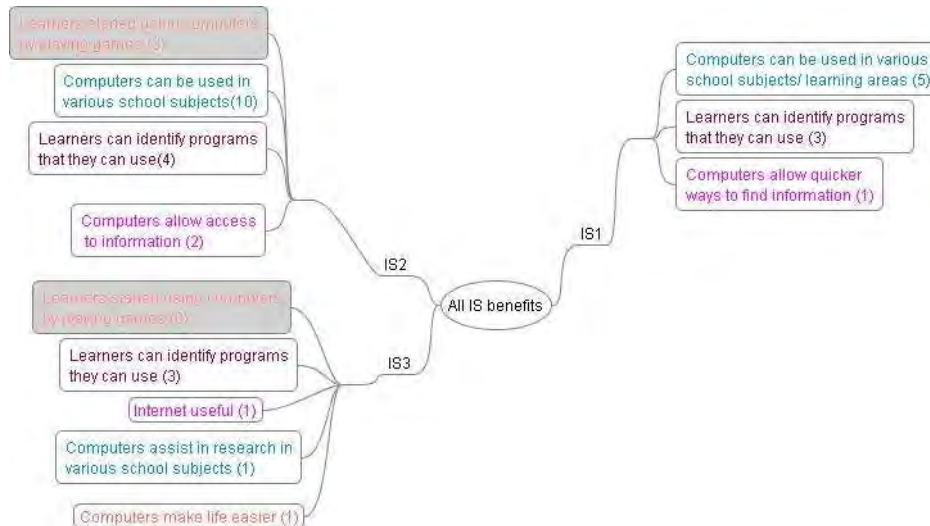


**Figure 4.27 Benefits mind-map: Use of ICT for information access**

Learners from Independent Schools perceive computers as a valuable source of information and seem to be aware of the benefit of the Internet in terms of their learning. They display a fairly general notion of ‘information’ as learners from both IS 1 and IS 2 do not specifically reveal the specific kind of information that is at their disposal on the Internet. Equally, learners from IS 3 only acknowledge the usefulness of the Internet without being specific how the Internet actually helps them. During the focus group interviews, one learner from IS 1 stated that, “*They expose us to easy quicker ways to find information like the Internet*” (IS L13).

#### 4.8.4.3 Use of ICTs for games

The fourth most frequently occurring comment is about the use of ICTs for playing games. This comment was made by learners from the IS 2 & IS 3 only (Figure 4.28).



**Figure 4.28: Benefits mind-map: Use of ICTs for games**

During the focus group interviews learners from the IS 2 and IS 3 claimed that they have been using computers for playing games since they started school. They seem to have used computer games as a foundation for more academic work at a later stage as one learner stated that, “*I started using them [computers] when I was young, so it was mostly games. It was only really when I came to grade 8 that I started using them for work*” (IS L14). Researchers such as Chou and Tsai (2007:813) are of the view that “computer games may enhance the players’ self-confidence ...” It might then be possible that games enhanced IS 2 learners’ confidence to use computers for more academic tasks. Learners plainly show the depth of knowledge they have about computer games because they mention the types of games they played. Learners from both IS 2 and IS 3 specifically mention *Solitaire*, *Minesweeper*, *Delta Force*, *Rugby* and *Racing* as their favourite games. The manner in which the learners from IS 2 and IS 3 talked about games bears testimony to the statement by Chou and Tsai that “playing computer games, allows children, especially boys ... to operate as experts” (2007:814).

It is no surprise that only learners from IS 2 and IS 3 learners were able to talk about the games they played because the interviewees from both schools were boys only. This finding in turn relates to view that when it comes to computers, it is common knowledge that ‘boys’ tend to dominate in terms of their interest in the technological aspect of computers whereas ‘girls’ tend to be concerned more with the context-driven aspects (Morgall 1993 cited in Murphy & Beggs 2003:81).

Although it was learners from IS 2 and IS 3 only who talked about games, the questionnaire data (Question 6) clearly indicated that 30 learners from all ISs have used computers for entertainment.

#### 4.9 Drawbacks/Disadvantages of using computers

The above discussion is based on what the learners perceive as benefits of using computers but that does not mean that they are not aware of the disadvantages of using computers. What I would like to highlight is that learners were able to identify the disadvantages of using computers whether they had access or not. Almost 90% of the comments (Table 4. 18) clearly indicate that access does not necessarily imply benefits but could very well be a drawback.

**Table 4. 18: Response rate to question 13**

Question 13	FDET N=40	FHOR N=7	FMC N=29	IS N=30	All schools N=106
What are the disadvantages of using computers?	18 45%	7 100%	25 86%	29 97%	79 75%

There are 45% learners from the FDET schools who seem to think that there are disadvantages of using computers. Again the FDET responses are the lowest and the reasons might include their limited access to computers whilst they clearly know what they want to use computers for and how they can benefit from using them.

The next data is based on the second last question of the questionnaire and 89% of the learners responded. Learners were expected to state their views on the disadvantages of using

computers in their learning and this is how they responded. Their responses have been categorised and each category has a number of responses and lastly an overall percentage (Table 4. 19).

**Table 4. 19: Disadvantages of using computers in learning areas/subjects**

Negative impact on learners	Computer illiteracy (12)	43%
	Laziness (11)	
	Encourage cheating/plagiarism (6)	
	Distraction (4)	
	Health risk (4)	
	Discourage writing with using pen and paper (4)	
	Relying on it too much (3)	
	Prevent creative thinking (2)	
	Addiction (2)	
	Language used (1)	
	Games (1)	
	Vocab doesn't improve (1)	
	Books neglected (1)	
Hardware	They are slow (5)	28%
	Expensive (5)	
	Number of computers used by learners (5)	
	Complicated (4)	
	Useless without electricity (4)	
	Loss of work (3)	
	Computers get broken (2)	
	Printing problems (2)	
	Need to be upgraded (1)	
	Need for security (1)	
Inaccurate or excessive information on the Internet	More information (2)	5%
	Less time too much information (2)	
	Internet (1)	
	Internet access	
	Have incorrect information (1)	
Impact on teaching and learning	No interaction between teachers and learners (2)	3%
	Not effective compared to a teacher (1)	
	Can't be used during exams (1)	

No comment	No comment	11%
None/Unsure	None (11)	10%
	I don't know (1)	

Most of the learners (43%) seem to think that the disadvantages of using computers directly affect them. They raise their concerns of being negatively affected physically as well as intellectually. Twenty eight percent of the learners are concerned with the functioning of computers, which can place them at a disadvantaged position. Only 3% of the learners seem to think that computers will take over their teachers' role in the classroom. Table 4. 20 shows the number of responses for each group of schools on each category.

**Table 4. 20: Disadvantages of using computers in learning areas/subjects for each group of schools**

School group	Negative impact on learners	Hardware	Inaccurate or excessive information on the Internet	Impact on teaching and learning	No comment	None/Unsure
FDET	9	5	2	1	10	10
FHOR	2	3	3	0	0	0
FMC	21	10	0	2	2	1
IS	20	14	1	1	0	1

Table 4.20 represents the categories that emerged from the responses or comment that were made by learners from the four groups about the disadvantages of using computers. Firstly, learners perceive computers to have a negative impact on their abilities, health and skills. This is evident in their responses where they said, *“learners tend to rely on the information retrieved from computers, and not use their minds sometimes”* ( FDET6 L1), *“because other children which use computers in home get spoilt and their minds cannot concentrate at school* (FDET3 L1), *“books are neglected”*(IS2 L1), *“Plagiarism and lazyness”* (IS3 L1), *“kids like games and they do not work”* (FMC1L1), *“some students might be computer illiterate, so that might bring down their marks”* (FMC3 L1), *“when sitting in front of the computer your back*

*and neck will get sore, and your eyes can get bad from watching the screen 24/7*” (FMC2 L1).

Secondly, learners identify computer hardware as being a disadvantage when it comes to using computers for learning. The following comments highlight the typical comments related to the problems around hardware: “*sometimes the ink is finished and sometimes there’s only one colour ink*” (FHOR L1), “*some learners put the virus to the computer*” (FHOR L2), “*also very expensive, have to keep upgrading them*” (IS1 L1), “*other computers are broken*” (FDET3 L2), “*there are a lot of students and too few computers because computers are expensive*” (FMC2 L2), “*could be faults if you wanted to print something or the computer could be down & not working*”(IS2 L2).

Thirdly, the issue of Internet and the information accessed seems to create problem according to the learners’ comments as they say, “*one would be more disadvantaged in terms of too much information*” (FDET1 L1), “*too complex, far too many areas to search*” (IS1 L2), “*scaffy and incorrect information*” (IS2 L3).

The next area of concern for the learners in using computers is the negative impact that computers might have in terms of the teacher and learner relationship during the teaching and learning process. This is reflected on some of the comments made and these include where they said, “*not as effective in comparison to when a teacher would teach you*” (FMC1 L2), “*it cuts the teacher off from the rest of students, the students will start relying on the computer to start teaching them*” (FMC3 L2), “*the pupils might actually put less effort because of the computer and there would be less interaction between pupils and teachers*” (FMC3 L3). Again, compared to other groups of schools a high rate of FDET learners did not comment suggesting that the FDET learners may not have had sufficient experience with computers to identify disadvantages.

#### **4.10 Summary**

The chapter has explored in depth the findings of the study. The issues of prior use of computers, access to computers, duration of computer use, purpose of ICT use, software use, integration of ICT within the learning areas, benefits and drawbacks/disadvantages of using

computers in the curriculum have been discussed. The results have shown that there is a gap between the different groups of schools in terms of access to computers as FDET schools' learners in particular have constantly implied that through their responses. The learners who participated in the study also revealed that there is limited integration of ICT into the curriculum. Again, these results reveal that learners, while acknowledging the value of ICTs especially being able to find information on the Internet – are not fully integrating ICTs into their learning at school. From the interest in the use of ICTs for entertainment, they may be using ICTs for informal learning activities. The key finding would seem to be that learners see that using ICTs is a way of doing things differently at school. However, it is extremely difficult to judge the learners perceptions over the four school groups as they have different levels of access, knowledge and skills. What is clear however is that those schools with poor ICT provision are at a disadvantage compared to those with sufficient infrastructure, but infrastructure alone does not guarantee integration of ICTs in the curriculum. Learners have shown that they have a voice, as they were able to articulate the potential benefits and drawbacks of using computers within the curriculum.

## **Chapter 5: Conclusion and recommendations**

### **5.1 Chapter overview**

This chapter concludes this study by delineating the limitations of the research and then summarizing the findings in relation to the research questions whilst making recommendations that emanate from the findings.

### **5.2 Limitations of the research**

The limitations of the study stem from the relatively large number of schools that were involved in the project. I believe if I had involved fewer than five schools in the study, I could have conducted more in-depth focus groups and elicited more extensive responses from a fewer number of respondents. Also, insufficient access to computers has resulted in learners providing limited answers to my questions due to their lack of hands-on experience.

### **5.3 Summary of findings and recommendations**

The goal of the study was to elicit the learners' voices on the integration of ICT for learning. In order to address the main question, the following subsidiary questions were posed.

Where do learners say they have access to computers?

For how long have learners been using computers?

For what purpose do learners use computers?

What kinds of computer programs do the learners use?

In which learning areas or subjects do learners most frequently use computers?

What are the learners' perceptions of the actual or potential benefits of integrating ICT into the curriculum?

What are the learners' perceptions of the actual or potential drawbacks of integrating ICT in the curriculum?

### **5.3.1 Learners prior use of computers**

Sixty five percent of learners from the FDET schools indicated that they have used a computer before which is rather surprising as Brandt's (2006) research showed that FDET schools have very poor access to computers. It is therefore no surprise that 28% of the learners claim that they have not used a computer before. The findings from the FDET schools seem to confirm Cawthera's (2002) research that the vast majority of schools do not have any computers. However, in contrast to Cawthera's conclusions that the majority of children have not seen or used computers before, more than two thirds of the learners at the FDET schools in this study report having actually used computers.

The responses from learners in the FHOR, FMC and Independent Schools indicate that 100%, 90% and 97% of learners respectively have used computers before. However, as indicated earlier, the FHOR response might be misleading as it is only Grade 11's who completed the questionnaires and so this might not be a true representation of other learners' responses. There is another surprising finding from the FMC schools where 10% of the learners did not respond at all to this question despite the fact that Brandt (2006) confirms that these learners do have access to computers in their schools.

### **5.3.2 Where do learners say they have access to computers?**

This study has also attempted to uncover the extent of access to computers learners have at home and at school. It was mostly the learners from the FHOR, FMC Independent Schools who indicated that they have access to computers both at home and at school. Access to computers at school for both FHOR and IS learners is rated at 45%, whilst for FMC learners it is 42%. On the other hand, access to computers at home for FHOR learners is rated at 27%, FMC 41% and IS 45%. These learners also indicated that their use of computers at home has allowed them to have more practice and that there was no need for their teachers to teach the basics of ICT use.

Only 2% of the FDET learners indicated that they have access at home. Whilst it could be regarded as a good sign that there is some access to computers for learners in their respective schools, it is also my concern that 36% of the FDET learners did not respond which probably means they do not have access either at home or at school.

The responses above have led me to conclude that a possible reason for FDET learners limited or no access to computers at home is that these learners reside in previously disadvantaged communities. The socio-economic disparities between these groups of schools seem to play a major role in terms of which learners have access to computers in South Africa. The DoE's intervention in providing adequate access to computers in FDET schools is therefore important as the lack of computer access at school might exacerbate the current socio-economic disparities and thereby widen the so-called "digital divide" Norris (2001 cited in Rodrigo 2005).

### **5.3.3 Duration for which learners have been using computers**

The FMC (100%) and IS (100%) are the only groups of schools that indicated that they have been using computers for years, whilst only 57% and 35% of learners at FHOR and FDET schools respectively report years of computer use. Once again, the FHOR response might be skewed as the comments were from seven learners from Grade 11s only. The issue of inadequate access for the FDET schools is reflected again by the 32% of "No response". The duration of computer use is directly linked to the duration of access to computers at schools, at home or elsewhere. The duration of computer use by learners from these schools, confirms Brandt's (2006) identification of the gap between the four groups of schools as far as computer infrastructure is concerned

### **5.3.4 Purpose for which learners use or would like to use computers**

In response to the question about the purpose for which they were using or would like to use computers, learners from all the groups of schools indicated that they use computers mostly for projects, essays and typing. The second most important purpose for using computers is entertainment and then only research. Although 27% of the FHOR, 24% of the FDET, and 18% of both FMC and IS learners indicated that they use computers for entertainment, 13% of learners from the FDET schools did not respond to the question at all. By contrast in response to the question in the questionnaire about possible use of computers even if they had not used computers before the FDET learners said that they would like to use computers for research whilst during focus groups they claim to be using computers mostly for projects, essays and typing. This is an interesting contrast as the FDET learners at least seem to have a perception

that computers are useful for research, but when they actually use computers, they use them for much more mundane activities such as word processing projects and essays.

Drawing from the above responses, I suggest that learners primarily use computers in a 'representational' manner as (Hokanson & Hooper 2000) as they mainly use computers to merely re-present information in another medium. This seems to indicate that computers are not yet being used in a 'generative' manner (Hokanson & Hooper 2000) where learners are able to think creatively whilst using computers. What this suggests is that access alone does not necessarily imply optimal use of computers, but it is the first and necessary step to ICT integration to the curriculum. So while I would recommend that the Department of Education (DoE) prioritizes the equipping of schools with reliable ICT infrastructure that would be accessible to learners, to meet their aim of having all learners ICT capable by 2013 (DoE, 2003:10) the DoE will also need to find ways to encourage teachers not to require only 'representational' use of computers, but 'generative' use as well

### **5.3.5 Kinds of computer programs that learners use or would like to use**

As might be expected from the 'representational' use of computers that the learners reported, the predominant computer program that they use is word processing software. The learners' response to the question about programs they can or would like to use displayed a high rate of using ICT for word processing with the FDET leading with 66% rate of responses, FHOR (64%), FMC (32%) and IS (37%). The FMC and especially the Independent Schools' learners displayed the greatest variety of software that they can use. These include *MSPublisher*, *MSAccess*, *MSOutlook*, *MSExcel*, *MSPowerPoint*, *MSFrontpage*, *Media player* and *Paint*. The finding that two thirds of the FDET schools' learners use computers for word processing and only 7% of them indicated that they can use spreadsheets and only 3% can use ICT for presentation (*e.g. MSPower Point*) shows the limited knowledge learners have about the different types of computers programs. As 24% of the learners from the FDET schools did not comment I conclude that the FDET learners do not have sufficient access to be able to identify the specific software programs. It is therefore important that the DoE encourages teachers to extend the range of computer programs used so that learners have the possibility selecting software that is appropriate for particular needs, rather than perpetuating a narrow conception of what computers can be used for in the curriculum.

Moreover, the use of MSOffice suite might be an indication that teachers expose learners only to that brand of software and perhaps have very limited knowledge on how to obtain Open Source Software. Another possibility might be the business aspect where Microsoft Company might be responsible for the donation of software that in return guarantees fully fledged marketing of their product. There is a need therefore to the DoE to ensure that learners are exposed to freely available Open Source Software (such as OpenOffice) so that learners are not limited by their prior experience of using expensive proprietary software only.

### **5.3.6 Learners' perceptions of the benefits of using ICT's for learning**

The study also attempted to elicit the learners' perceptions of the actual benefits of using ICTs for learning. There are five areas that learners from all the groups of schools perceived as benefits and these include:

Using ICT to access information (Internet)

Using ICTs within the curriculum

Software knowledge and skills

Using ICTs for projects

Using ICTs for recreational purposes (games).

The conclusion that I have come to is that learners from the FDET schools regard computers as the source of information regardless of the fact that they don't have the opportunity to access this information, as they don't have sufficient access to computers or Internet connectivity in their respective schools. What is common to all school groups on information access is that they all have a very loose concept of 'information' as they do not specifically indicate the type of information they will have access to when using computers. Learners from all the schools see the need for ICTs to be used within the curriculum despite the issue of different levels of computer access and varying levels of computer knowledge and skills.

The other common benefit learners perceive is the use of ICTs for recreational purposes, although this was at different levels for the different schools. Learners from FDET, FHOR and FMC schools did not specify the games they can play; whereas the Independent Schools' learners mentioned the different games they played by name. The FHOR and FMC schools' learners both mentioned that they use computers for downloading music. What this seems to indicate is that learners from the Independent Schools, the FHOR and FMC schools are using computers for a range of other purposes than learning, but this might be encouraging them to

become more computer capable which may have potential benefits for the way in which they use computers in the formal learning environment.

I recommend that the DoE equips schools with the sufficient ICT infrastructure so that learners can have sufficient access and use of computers for their learning and be exposed to different kinds of computer software they can use within different learning areas. More importantly, as I have indicated earlier, the learners indicate that they expect to use computers for research and see this as the major benefit and their voices could impact on the policy makers. The learners' voices might encourage policy makers to step back and revisit some of the issues within the curriculum and particularly the way in which learners see that they can use computers to support their learning endeavours.

### **5.3.7 Learners' perceptions of the drawbacks of using ICTs for learning**

Learners from all the different school groups collectively indicated how *ICT use can impact on learners*; as they mention that some learners become lazy, addicted and at times books are neglected; *type of hardware used* particularly refers to the speed of the computers, learner-computer ratio as well as the costs involved with maintenance of the broken machines *inaccurate or excessive information on the Internet* and *ICTs impact on teaching and learning* can be regarded as the potential drawbacks of integrating ICTs in the curriculum.

The above responses have led me to conclude that whilst learners see the need for integrating ICTs in the curriculum, particularly in using computers for research, they are wary of the disadvantages of using computers in the curriculum. Learners have highlighted that computers can negatively impact their health as FMC 2 Learner indicated that "*when sitting in front of the computer your back and neck will get sore and your eyes can get bad from watching the screen 24/7*" whilst FMC 1 Learner indicated that, "*it might be a health risk*". The learners also perceive a computer as a tool that could deny them a skill of creative thinking; development of [no improvement in] language use; less use of the use of fine motor skills [writing using pen and paper] and encourage plagiarism.

The availability of ICT infrastructure as well as its maintenance is the important issue for the learners as they are concerned with problems of a number of computers in their respective schools; the high costs of fixing broken computers as well as upgrading them. Again, in as

much as learners consider the Internet as the source of information, they are also aware how the information can affect them. They acknowledge that the information can be incorrect at times and can also be time consuming, as there is “*too much information*”.

Learners have also shown how they need their teachers whilst using computers for learning. They do not compare their teachers to computers, but want the teachers to be physically there to guide them as Noss and Pachler (1999) indicate that “the teacher needs to spend a great deal of time monitoring, directing and assisting in the learning process” (1999:14). In addition, 3% of the learners view computers as tools that alienate them and provide no interaction between teachers and learners. Ten percent of the learners could not identify the disadvantages or drawbacks of using ICTs and were convinced that there are no disadvantages, whilst 11% of them did not comment at all. The responses above are an indication that learners’ voices need to be heard, as they are aware of how computers can affect their learning negatively as well as positively.

## 5.4 Recommendations and conclusion

The main goal of this research study was to

Establish learners' experiences and perceptions of the value of integrating ICT into the curriculum and the extent to which they believe that ICT is meaningfully integrated into the curriculum.

In short I conclude that while learners seem to value the potential of computers for research, in practice they seem to use computers predominantly for word processing of projects and essays. So although they are using computers within the curriculum, learners do not indicate that their use of computer is meaningfully integrated into the curriculum.

In trying to accomplish the main goal of integrating computers meaningfully into the curriculum, a number of recommendations have been proposed in attempting to address the issues raised by the learners in the study. These include the need for:

The DoE's intervention to address the lack of computer access at school and prioritization of the equipping of schools with reliable ICT infrastructure that would be accessible to learners to meet the DoE's aim of having all learners ICT capable by 2013 (DoE, 2003:10).

The DoE to ensure that learners are exposed to freely available Open Source Software (such as Open Office) so that learners are not limited by their prior experience of using expensive proprietary software.

The DoE and teachers to take note of the gap between policy and classroom practice.

Computers to be used for research as the learners' request and not merely for word processing.

The need for computer literate teachers who are capable of using computers and being of assistance to learners in the process of integrating ICT into the curriculum.

On reflection, there is a need for ICTs to be integrated in the curriculum, but there are factors that affect the progress or deterioration of the process. Sharma (2003) states that, "the successful adoption of ICT for education depends largely on the policies designed to popularize ICTs in the educational sector" (2003:513). It is for this reason that I have continuously mentioned that this study might have an impact on the policy makers. The actual

integration of ICTs in the curriculum would seem to depend on policy informing practice; equipping schools with ICT infrastructure, adequate access for learners, listening to learners more carefully and understanding how they think they can use computers and more importantly, the training of teachers with ICT skills to adequately respond to the learners' needs for integrating ICT into the curriculum. The recommendation for further study would be based on the issue of the gap between policy and practice to actually find out whether there have been amendments on the ICT policy and how it should be implemented in the classroom or extensively integrated within the curriculum.

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# Appendix A: Learner's Questionnaire

ICT in Research Project: Makana District Secondary Schools

## Learner's Questionnaire

Please would you fill in your responses to these questions as honestly as possible. This questionnaire is confidential so please do **NOT** write your name on the questionnaire.

What is the name of your school? .....

Which grade are you in? .....

How old are you? .....

Have you used a computer before?

Yes If yes, go to question 2&5	No If no, go to question 3&4
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Where have you used a computer?

<b>At home</b>	<b>At school</b>	<b>Other: (specify)</b>
<b>Yes</b>		<b>No</b>

Would you like to use a computer?

What would you like to use a computer for?

--

For how long have you been using computers?

... weeks	... moths	... years
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How have you used computers?  
(Tick all that are appropriate)

Entertainment (games, music)	Research (CD-ROMs, Internet)	Projects, Typing up essays
Communication (e-mail, chat) e.g. IRC, MSN, ICQ	Presentations, Posters	Computer literacy & programming
Other: ( <i>Specify</i> )		

Which programs can you use?  
(Write down the names of the programs)

--

In your school computers are used  
(Tick all that are appropriate)

For learning about computers (Computer literacy, Programming)	For learning in other subjects	As an extra-mural activity (e.g. Computer Club)
--	---	--

In which learning areas/subjects do you use computers?

--

How often do you use computers in these learning areas/ subjects?

... hours a week	... hours in cycle	... hours in a term
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Why do you think that it is worthwhile to use computers in learning areas/subjects?

Why do you think teachers should give learners work to do on computers?

What are the disadvantages of using computer?

How do you think computers could be used more extensively in learning areas/subjects?

Thank you for taking the time to answer this questionnaire.

Miss Nombeko Mbane (MEd research student at Rhodes University)

## Appendix B: Letter to the principals

4 June 2004

Headmaster

### Permission to conduct research at your school

One MSc and two MEd students from Rhodes University, Ingrid Brandt, Nikiwe Maholwana-Sotashe and Nombeko Mbane, are involved in a research project partially funded by the National Research Foundation. The research is based upon investigating the integration of information communication technology (ICT) in the school curriculum of all 13 secondary schools in the Makana District. The study hopes to find out what current computer infrastructure exists at each school and to what extent ICT is being used within the curriculum or, if the school does not yet have computers, how they would like to deploy them so that a possible model of computer networking can be suggested.

There are three main questions that are divided amongst the three students:

What models of networked computer technologies can support secondary schools in implementing their vision or need for integrating ICT in the curriculum? [Ingrid Brandt]

To what extent do Makana Secondary School teachers' integrate ICT in the curriculum? [Nikiwe Maholwana-Sotashe]

How does the integration of ICT in the curriculum enhance secondary learners' learning? [Nombeko Mbane]

The data collected from these three questions will be used to answer the broader question of the project that seeks to identify strategies used in the Makana Secondary Schools to integrate ICT in the curriculum. Professor Cheryl Hodgkinson from Rhodes University Education Department will undertake the collation and interpretation of the collective data.

The research method adopted is a **survey** that will require:

A **questionnaire** (Questionnaire 1) to be completed by the *person in charge of the IT equipment* as well as a **follow-up interview** with this person by Ingrid Brandt. Ingrid will also need to have a **look at the network infrastructure** to ascertain technical specifications.

A **questionnaire** (Questionnaire 2) to be completed by at least *two teachers* who have either used or would like to use computers in their teaching as well as a **follow-up interview** with at least *one teacher* by Nikiwe Maholwana–Sotashe.

A **questionnaire** (Questionnaire 3) to be completed by at least *10 learners*, two from each grade to answer a questionnaire that will be sent to you prior the visit of the three students. On the day of their visit Nombeko Mbane will need to conduct **focus group interviews** with a minimum of *5 learners* (one from each grade).

Further negotiations on how and when the research could best proceed will be done on their first visit to your school. It is particularly important that we have access three quiet venues for the tape recording of the interviews.

The findings from this study will be sent to the Department of Education to provide them with information about what needs to be done before ICT implementation and what needs to be done to ensure successful integration of ICT in the Makana District.

Thanking you in anticipation for working together in the interests of improving the quality of education in the Makana District. If you have any further questions about the project, please feel free to e-mail or phone either of the two supervisors, Prof Cheryl Hodgkinson or Dr Alfredo Terzoli. A list of all our contact details is attached for your convenience.

Yours sincerely

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Ingrid Brandt

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Nikiwe Maholwana-Sotashe

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Nombeko Mbane

ICT in Research Project: Makana District Secondary Schools

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## Appendix C: Interview schedule for learners

Thank you for taking time to answer the questionnaires that I sent to you. I have come to you so that we can talk about some of the answers that were not clear to me. This is to give you a chance to say more on what you wrote on the questionnaire maybe the space provided was not enough for you to say everything that you think is important. Now is your chance to do that.

Can everybody tell me which grade he/she is in?

How many learning areas/ subjects do you have at your school?

Which of these learning areas/ subjects have you done projects on?

Where did you get the information to do the projects? Were you allowed to use the computers to find information?

How helpful was the information?

Have you used computers for any other activity at school? (other than projects)

What did you use them for?

Can you tell me more about the programs that you can use? e.g. which program helps you do what in which learning area/subject?

You have mentioned subjects like English and Economics in which you used computers and I would like to know exactly what you did and how you did it?

How much time do you spend using computers? Is there enough time to do the work that you would like to do?

Most of you said that teachers should give you (learners) work to do on computers so that you can learn more about computers and be able to use it for all learning areas. What would you like to learn using computers?

Some of you said that there should be more computers; more training and I would like to know why do you think there is a need for that?

Why do you think computers make learning interesting?

What do you think are the benefits of using computers?

What do you think are the drawbacks of using computers?

## Appendix D: FDET 1 Transcription

Interviewer: Nombeko

Interviewees: \* Mthunzi, Avela, Mimi, Ntombi, Thando, Siphon and Luzuko

\*Not their real names

Nombeko: Can you please introduce yourselves only by first names and the grade you are in.

Interviewees: I'm Mthunzi in grade 11

Avela in grade 11

Mimi in grade 11

Ntombi in grade 11

Thando in grade 11

Siphon in grade 10

Luzuko in grade 9

Nombeko: Which learning areas or subjects have you done projects on?

Thando: What do you mean by projects?

Nombeko: I mean to be given a topic that you would do research on or something, maybe in Science or...

Mthunzi: English, what would you like to do in 2010, that's the only project we were given.

Nombeko: What were you expected to do?

Mthunzi: Like I said, Miss, in 2010 like from now I continue with my schooling until 2010.

Nombeko: So the information you used is from your own perception and you didn't perhaps get it from the library or what?

Mthunzi: No, all the information was from my own thinking.

Nombeko: If you had computers in your school, how would you use them? (Long Pause)

Nombeko: How do you think computers could assist you?

Thando: They could help us in many things in projects that you can get like if you have a project that you need to research on maybe Nelson Mandela or something like that, maybe most people don't have library cards so it's difficult to get hold of relevant books, so computers would give us a better opportunity to search whatever you want. It's difficult to use computers here at school because only few individuals have access.

Nombeko: Used by few individuals?

Thando: Yes

Nombeko: So you want them to be used by everybody here at school.

Thando: Yes

Nombeko: Which computer programs that you know of and can use? (Pause)

Nombeko: There's none that you can use? Have you not heard of any maybe, like what you use when you research?

Interviewees: No

Nombeko: Have you never heard of the Internet?

Thando: I've heard about it.

Nombeko: Yes...

Sipho: I've heard about it but I don't know what it is.

Nombeko: Are you interested to know what it is, if computers could be available and would you like to use it?

Sipho: Yes I would like to use it.

Nombeko: Okay, would you like to say something (referring to another learner).

Thando: No, I just want to say that maybe the Internet is important to have at schools because we can't do research on most of the computers we have at school. There was one time where we had to do something at Rhodes, something in connection with Maths and Physics so there we got most of the things because there is Internet.

Nombeko: Which learning areas do you think would be easier or more understandable when taught with computers?

Avela: It's Science.

Nombeko: Only Science?

Mimi: And Maths.

Nombeko: How can computers assist you in these learning areas? (Pause)

Nombeko: What problems do you have that you think computers would solve for you?

Thando: The problem that we have is that when we are expected to do research we don't know where to start so that's why I say computers would be of great help.

Nombeko: Do you think there are any disadvantages of using computers?

Thando: I don't think there are any disadvantages because most job opportunities are opened to those who are computer literate and we know nothing about computers. It might be at least better if some start using it in grade 11 maybe taught for one year and when you pass grade 12 you have a little bit of knowledge but still needing more skills and more training. So, computers should actually be one of the subjects that we are taught.

Nombeko: At the moment, do teachers use computers to teach you?

Thando: No, they don't.

Nombeko: In all learning areas/subjects?

Thando: There was a period where learners were asked to pay R50 to get computer lessons and a few learners paid but I don't think they were given any lessons.

Nombeko: They paid R50 and did nothing on computers?

Thando: They never even touched the computers.

Nombeko: Okay then thank you for your time.

## Appendix E: FDET 3 transcription

Interviewer: Nombeko

Interviewees: Learners from grade 8-11

\*Not their real names

Nombeko: I would like you to say as much as you can and if you feel that you are unable to express yourself in English on some of the questions, feel free to say it in Xhosa.Ok

Interviewees: Yes

Nombeko: Right, can you start by just saying the first names and grade you are in.

Interviewees: My name is Siya and I'm in grade 11

My name is Themba and I'm in grade 11

My name is Phumla and I'm in grade 10

My name is Nomsa and I'm in grade 9

My name is Xola and I'm in grade 9

My name is Bongani and I'm in grade 8

My name is Sipho and I'm in grade 8

My name is Lizo and I'm in grade 9

Nombeko: Which learning areas are you busy with in each of your grades? Can we start with you?

(Pointing at the first learner on one of the seats).

Lizo: I'm doing all subjects.

Nombeko: Can you name a few?

Lizo: Xhosa, English, Maths, and other subjects

Themba: The most important one for me is English

Lunga: It's Maths for me

Xola: It is Maths and Science for me

Nomsa: Maths, Xhosa, Science, EMS, Arts and Culture, English

Phumla: Maths, Xhosa, English, Biology

Themba :...( text missing).

Siya: My subjects are Maths, Science, Geography, two languages Xhosa and English

Nombeko: Ok, Uhm... from these learning areas that you are doing, which ones have you been able to use computers on?

Siya: Like Science and Biology there's this program, website that we go to and search for information on Biology or systems that are in Biology. For Science we are doing a project now for Science expo so we are using computers to like for printing.

Nombeko: Can you tell me more about this Science project?

Siya: Ja, Uhm... like in 2002 we entered and in 2003 we entered again, so it's a science expo project. You think of a uhm... hypotheses and try to research about the hypotheses and come up with a conclusion so I'm doing a project now this year on music. I can't tell you a lot about the project it is not finished yet.

Nombeko: Ok so you are still busy with it, ok, would anyone like to say something about...

Nomsa: Well none, whenever I have got to do research or I've got a project, I go to the library.

Nombeko: To the library?

Nomsa: Yes

Nombeko: Don't you use computers?

Nomsa: No

Nombeko: Why not?

Nomsa: Because I haven't paid (giggle).

Nombeko: Oh, (giggle) and you?

Lunga: Whenever I have to do research I use computers and when I can't find what I'm looking for I then go to the library.

Nombeko: Is there anyone who assists you when searching for information using computers?

Lunga: I do get assistance sometimes when there are people around

Nombeko: What about you? (referring to another learner)

Bongani: The project that I had I finished it without using computers

Nombeko: What did you use?

Bongani: I asked my uncle to assist me.

Nombeko: Don't you use computers?

Bongani: When I have home work I do use computers.

Sipho: I don't use it (computer) that much, I use it when there is a project but the project that we had, we used grade 12 books and we did not need computers to do it.

Nombeko: What was the project about?

Sipho: It was a project about computers and I did not feel that I had to use computers because all the information was written on the board for us and we had to find other information from the grade 12 books.

Nombeko: I'm interested in the project, can you take me through step by step, and what was it all about?

Sipho: We were expected to explain what the Internet is for and what computer programs are used for.

Nombeko: And you (referring to another learner)

Lizo: I use computers mostly for Maths where we find lots of things.

Nombeko: Like what, can you be more specific?

Lizo: Things like relationships and algebraic expressions.

Nombeko: Last time I was here, you mentioned that the number of computers working is not enough and now I notice that most of the computers have been fixed so, what have you done so far using computers? Now that they have been fixed.

Siya: Uhm... I didn't have a website well I had it first then I deleted it and started a new one because we have more computers. My liking of computers somehow, the computers to me are a short cut to maybe an assignment I didn't do maybe yesterday so I can come here and print or copy and paste something.

Nombeko: (Giggle) and for you?

Themba: For me since the computers have been fixed, I didn't have a website because it had a fault last time so I used computers to make a new one. It took me two days to make a new one. I was so fast. Now I am busy with the Science expo project.

Nombeko: For you? (referring to another learner)

Phumla: I haven't done anything.

Nombeko: Nothing at all?

Phumla: Ja, I had a website before the computers were fixed.

Nombeko: So you haven't done anything now that the computers are fixed.

Nomsa: I'm very happy that computers have been fixed because, before you had to come here (computer lab) and wait for others to finish what they were doing and so we spent a lot of hours here but now I come here and sit in front of an empty computer and do my stuff and yesterday I started doing my website.

Nombeko: For you? (referring to another learner)

Xola: For me, there is a new program that I use without asking for anybody's assistance and that makes me happy because I can work on my own and do my work without bothering anybody.

Nombeko: What is the name of this program that you can now use?

Xola: It is Microsoft Publisher

Nombeko: What have you used it for?

Xola: I am trying to make myself a website.

Nombeko: Can you tell me more about your website, what have you included in it?

Xola: My CV, my life information about me and my family and then my contact details and my own poem.

Nombeko: A poem? I saw this poem of yours and was interested; can you tell me more about it?

Xola: I can't tell you exactly what it is all about except that it is about nature.

Nombeko: I saw that you were also busy with your website (referring to another learner).

Bongani: Yes, I was doing a webpage, Miss Joy teach (es) me how to do a webpage now I'm doing it, I didn't finish it.

Nombeko: Ok, what is in it so far, what have done so far?

Bongani: I've done my life, CV and my family life and still not finished

Nombeko: Ok

Sipho: I'm also busy with my website; I didn't have it last year.

Lizo: I'm also using Microsoft and busy with my website.

Nombeko: So, you are all excited that the computers have been fixed.

Interviewees: Yes

Nombeko: (Giggle) ok, last time someone mentioned something about an HIV project. That was you (referring to the learner)

Nomsa: Yes

Nombeko: Can you tell me more about that?

Nomsa: Well we haven't done it we did it last year eh... last year we did a new one well, it was about communicating with students from Italy telling them about ourselves and asking them questions about them.

Nombeko: Ok, eh... you mentioned something about dream weaver; can you tell me more about that?

Siya: Uhm... dream weaver is program that we use to design our websites so that's the program that I'm using now to design my new website, some people came here to train us about dream weaver. Now we are training other students but we didn't finish so we mostly concentrating on our websites.

Nombeko: Ok now that computers have been fixed, is time enough for you?

Nomsa: Yes definitely

Nombeko: How?

Nomsa: I can come here and do whatever I like then go when I want to go.

Nombeko: Do you think there are any disadvantages or drawbacks, because what you have been talking about so far are the good things about computers. Are there any disadvantages?

Siya: Ja, the one I mentioned, for a shortcut to an assignment you haven't learnt anything because you come to a computer and you copy something and paste then you print, then you take that printed material to your teacher and then the teacher asks you what you have written, you don't know anything and you haven't learnt anything from that project. So, that's one disadvantage.

Nombeko: Any other?

Nomsa: Well, I agree with him, students are being lazy because they can get what they want from computers instead of going to the library and having to dig for information.

Nombeko: Ok, uhm... Do you think computers that are currently working in your school will contribute to your learning?

Nomsa: Yes, absolutely.

Nombeko: How? If I may ask.

Nomsa: Because if you have got a project you would come here and use a free computer and the computers help a lot sometimes.

Siya: Yes, I think it will help a lot because we used to come here and waited for someone using a computer then if you have lots of homework when you have finished here you go home late and you get home you are tired, so that's why I'm saying it is a good thing that we have more computers here.

Nombeko: Would anyone like to say anything more on what we have discussed? (Pause) please feel free to say anything because what you say here will be treated with confidentiality.

Lizo: There are students who have paid for computer literacy and they don't spend much time using computers because the number of computers is still not enough and yet there are so many of us who want to use computers.

Nombeko: Do you think if every learner could pay, how will the school manage?

Nomsa: Well, I think we have to take that money to fix the computers that don't work.

Nombeko: Ok, well if... would you like to say something?

Siya: Ja, I want to say that computers have changed the way I live my life because when I arrived here at (FDET 3), I didn't concentrate much on education then, I cared for using computers, so the time for playing was taken by training for computers. When I come home my mind is on education and when I have homework or a project, computers help me so I will say computers here at school have helped me a lot.

Nombeko: Would you like to say more?

Nomsa: Well, I would really love it if we had computer lessons for the whole school, in our periods if we have time the whole class comes here to the computer centre and taught how to use computers because a lot of people don't have access to computers.

Nombeko: Because of...?

Nomsa: Because you have to pay to use computers and some of us can't afford.

Nombeko: If there's nothing more that you would like to say, I would like to thank you for the information that you have shared with me and I believe it is going to contribute a lot in my work, Thank you.

## Appendix F: FDET 4 transcription

Interviewer: Nombeko

Interviewees: \* Vusi, Mzimkhulu, Langa

\*Not their real names

Nombeko: Can you tell me just your first names and the grades you are busy with?

I'm Vusi doing grade 12

I'm Mzimkhulu doing grade 12

I'm Langa doing grade 12

Nombeko: Which learning areas are you studying here at school?

Vusi: Maths, Biology, Accounting, and 2 languages Xhosa and English.

Nombeko: Which subjects have you done projects on?

Vusi: Accounting, Physics, Biology and Maths

Nombeko: Can you take me through on just one...

Vusi: Project

Nombeko: Ja.

Vusi: I once had to do a Physics project on a (text missing) which I knew nothing about so I went to Rhodes University to find out more about it so I went to the Geology department.

There I got help eh... I got all the information that I needed and did my project and I passed with an A.

Nombeko: Oh! Good for you.

Langa: Uhm... I did an Art project uhm... it was based on sculpture using clay. My first one was on life experiences I symbolised; I used symbols which were books for knowledge uhm... a knife for crime and a bottle of wine for alcohol, ja.

Nombeko: If you had access to computers, do you think that they would assist you in your learning?

Interviewees: Off course.

Nombeko: Can you tell me how?

Vusi: Well, I think the possibilities with computers are not limited well... there's much that you can do with it like when I had my project like if I had access to a computer I would have just searched through a computer.

Mzimkhulu: You can use search engines from the Internet to find information.

Nombeko: Which computer programs that you are able to use?

Mzimkhulu: Microsoft Word.

Nombeko: Only Microsoft Word?

Mzimkhulu: And the Internet as well.

Nombeko: Are there any other ones that you would like to use?

Mzimkhulu: If we knew about them maybe but we only know about the ones that we use here at school.

Nombeko: Okay, but haven't you heard about any other ones maybe...

Mzimkhulu: No (giggle)

Nombeko: Okay, eh... I don't know, it seems like you are the ones who filled in the questionnaires eh... on the questionnaires one learner mentioned that it is the teacher who collects information from the computer. Maybe you wouldn't know anything about that but I would like to know if you use computers on other learning areas.

Langa: No.

Nombeko: Not a single one?

Mzimkhulu: Only computyping.

Nombeko: Computyping

Mzimkhulu: Yes

Nombeko: Would you like to use computers on other learning areas?

Langa: Yes, we would like that very much because uhm... when you use computers you get a lot of information and it's easy like doing projects and all that stuff you can make simple researches.

Nombeko: Okay, do you think that there are any disadvantages of using computers?

Interviewees: No we don't think so.

Mzimkhulu: Except for blinding, that your eyes could be messed, other that that I don't think...

Nombeko: Would you like to add anything?

Langa: I would like the government to supply us with more computers because in our school there's hardly computers that work properly just like here at school many of the computers we have are not working properly but ja we use them and we struggle because most of the people here at school can't use computers because our computer lab is small and has few computers. If there were more computers then everyone here at school would be able to use computers.

Nombeko: Thank you very much for your time.

## Appendix G: FDET5 transcription

Interviewer: Nombeko

Interviwees: \*Mlamli, Babalwa, Zukiswa, Mandla, Siya and Lunga

\*Not their real names

Nombeko: Ok ndicela nizazise nokuba kuqale banina ungachazi ifani yakho, uchaze nje igama negrade oyenzayo.

Interviewees: NdinguMlali kugrade 10

Babalwa grade 10

Zukiswa grade 9

Mandla grade 9

Siya grade 11

Lunga grade 11

Nombeko: Ok eh... zingaphi i-learning areas enizenzayo apha esikolweni?

Lunga: Actually senza i-subjects yi Physics neMaths neBE, neBiology ne-languages isiXhosa neEnglish.

Babalwa: Kwa grade 9 sine learning areas eziyi-9 iTechnology, Arts & Culture, Life Orientation, Human and Social Sciences, Economic and Management Sciences, Maths kunye neLLC that is iEnglish nesiXhosa.

Zukiswa: Nakuthi ziyafana.

Nombeko: Kwezi learning areas okanye isubjects ninazo apha esikolweni, zeziphi enenze i-projects kuzo?

Lunga: Kuthi yi-Biology ne- Physics mhlawunbi siyo-research (a) mhlawmbi ngalo nto. Siye nase library siyokufuna i-information.

Nombeko: Abanye?

Mandla: Kuthi iye ibeyi-Science ne-Technology isikakhulu

Nombeko: Awunandixelela ukuba yeyiphi mhlawumbi i-project eseniyenzile, soze nibe kanti akukho project niyenzileyo.

Mandla: Like kwa-Technology we have to build a house and pha kwa-Science siye sinantsike like nikhethe ba nifuna ukwenza ntoni if nifuna ukwenza imehlo lomntu nenze imehlo lomntu then ni-label (ishe) ke ngoku.

Nombeko: Okay

Zukiswa: (giggling) KwaPhysics thina besenze infact kwiBiology siye safunda ngabantu abapregnant ba kwenzeka ntoni kubo.

Nombeko: Okay, niyifumene phi i-information?

Zukiswa: Siye e-library ngoba asinazo i-computers.

Nombeko: Okay

Siya: Then enye siyifumene ebazalini.

Nombeko: Ukuba mhlawumbi zinokuba khona i-computers apha esikolweni nicinga ukuba zinganceda njani ba manikwazi ukwenza i-research ni-search(e) i-information?

Lunga: Mh... okokuqala, i-computers besi... ngomnye umGqibelo sakhethwa apha esikolweni sokwenza ilantuka i-Physics ne-Maths eSt Andrews qho ngomGqibelo. Besifika sifundiswe ke ngendlela e-operate (a) ngayo i-computer nendlela ofuna ngayo i-information kwi-computer. So if singanazo i-computer apha esikolweni zingasanceda kakhulu loo nto ingasi-assist (a) gqitha.

Nombeko: Akukho nto ufuna ukuyithetha?

Mandla: Hayi, akhonto okwangoku (giggle).

Nombeko: Akhonto ninoyongeza mhlawumbi?

Mlamli: Luninzi ulwazi esinokulufumana kwi-computer.

Nombeko: Like...?

Mlamli: Zikhona izinto esingazaziyo ezifundiswa apha esikolweni kufuneka mhlawumbi sikhangele e-library, sometimes uyakwazi ukuya e-library ufumanise ukuba azikho phaya ezifuneka kulo project unayo. So at least if bana apha esikolweni besinobanazo i-computers at least besizo succeed(a).

Nombeko: Okay

Zukiswa: Sometimes i-information yase- library ayiphelelanga then i-computers zina more information.

Lunga: Sometimes enye i-information yase-library isikakhulu ivela kwi- news papers enye uyifumane kwincwadi ezi kukhona incwadi zamabali amafutshane apho ufumana khona kodwa ubenento yokuba ayiphelelanga. At least i-computer yona ininzi eyayo i-information engangcono.

Nombeko: Ok eh... abantu abafunda u-grade 11 apha ba-mention(e) i-Encarta ne-Encyclopedia. Can you tell me more about that?

Lunga: Mh... actually thina safika unyaka sephela kukho abebeyenza, bakhona abayi-two abangekhoyo apha abayiqale ngo-January, so thina kwabe sekushiyeke i-two weeks so asakwazi ukufakwa ukuba senze nto kwi-encyclopedias.

Nombeko: Ingantoni, Ingantoni? Ndifuna ukwazi.

Lunga: Actually mh... yona it's about if ubhale i-essays zakho ubhale izinto zakho uzifayilishe into ezinjalo.

Nombeko: I-Encarta yona?

Lunga: I-Encarta... that's why ndisithi andazi more andinayo enye i-information nge-Encarta.

Nombeko: Eh... Uba kunokuthiwa ke ngoku nazi i-computers, zeziphi i...computer programs eninozisebenzisa, eninomdla ba niyabawela ukuzisebenzisa?

Siya: At least mhlawumbi ukwazi ukutayipa kwi-computer.

Nombeko: Word processing ewe.

Siya: Noku research (a) i-projects ozifunayo.

(Total silence then giggle)

Nombeko: Azikho mhlawumbi ezinye enizivayo?

Lunga: Actually thina pha kwa-grade 11 besine idea yoku-build(a) i-robot imoto so besizawukwazi ukuthi mhlawumbi sifune i-information kwenye indawo abanye abantu mhlawumbi like i-access kwi-Internet. Sifumane like mhlawumbi indlela esinokuqala ngayo ukuyenza sikwazi ukuyibhala siyenze ibesi-structure so siyithumele kulo mntu asibonise indlela esinokuyenza ngayo.

Nombeko: Okay, eh... nicinga ukuba zeziphi i-learning areas enicinga ukuba zezona zona zona zifuna ukuba manisebenzise i-computer, enicinga ukuba ningazazi bhetele?

Siya: Like into endiyicingayo mhlawumbi yi-Science and then ne-Maths plus ne-Biology. Ngoba like serious zizo ezibangela ukuba sifune i-computer ngoba sifuna i-information more ngazo. Actually asiyifumani like i-information apha esikolweni.

Nombeko: Nicinga ukuba i-computers zizakwenza umahluko emfundweni yenu? If nithi ewe, njani mhlawumbi?

Mlami: At least zingawenza umahluko e-life(ini) yethu at least lukhona ulwazi onolufumana kwi-computers esingakwazi ukulufumana apha esikolweni.

Nombeko: Nicinga ukuba alonelanga olu ninalo ulwazi oluziswa zikitshala nifumane itext books?

Lunga: Actually i-computers ziyakwazi ukuyenza easy sometimes ngoku into mhlawumbi ibonakala inzima. Abantu bebesebenzisa i-computers pha abafana noNyaluza nabafunda eNombulelo zikhona mos i-computers eNombulelo so thina bebesishiya ngoba-fast since bona benazo i-computers kubo ezikolweni so ba sinozifumana at least zingasanceda.

Siya: Enye into inga-save(a) nexesha ngoba xa une-project you would know ba uzakuya e-lab kodwa ngoku kufuneka uye e-library apha elokishini ufike i-information ingaphelelanga, uphind uthathe ixesha ukuya kule ise-town i-library and loo nto ithatha ixesha elininzi.

Nombeko: Mos yonke into inecala elihle nelibi. Konke oku sithetha apha sithetha ngecala elihle le-computers. Anicingi ukuba likhona icala elibi le-computers?

Mlali: Actually ndicinga ukuba i-computers zibangela ukuba singabi zi-creative thinkers. Ndinga ukuba lelona cala libi le-computer elo.

Nombeko: Ukhona umntu o-mention(e) into malunga nombane.

Lunga: Okay ndiyakhumbula ngoku (giggle) ngaphandle kokuba umbane unqabile kwaye ubiza imali eninzi so lonto ithetha ukuba isikolo kufuneka sibhatalele yonke into especially apha esikolweni sometimes umbane uyacima and loo nto ithetha ukuba sizaku-lose(a) i-information.

Nombeko: Ingaba ukhona umntu ofuna ukongeza enye into? Ukuba akakho mandinibulele ngexesha lenu enkosi.

## Appendix H: FDET 6 transcription

Interviewer: Nombeko

Interviewees: \*Not their real names

\*Nomhle, Busi, Ntombi, Monica, Zolani, Zuki, Vuyo, Nomonde, Ziya, Sino

Nombeko: Can you introduce yourself using your first names and the grades you are busy with?

Interviewee: Nomhle grade 10

Busi grade 10

Ntombi grade 12

Monica grade 10

Zolani grade 11

Zuki grade 11

Vuyo grade 12

Nomonde grade 12

Ziya grade 12

Sino grade 10

Nombeko: Can you tell me about the subjects or learning areas that you do in your different grades?

Siya: Physics, Maths, Biology, Economics and Languages, that's what I do.

Ntombi: We do the Languages, Economics, BE (Business Economics) and Accounting.

Nombeko: Which of these subjects or learning areas have you done projects in?

Vuyo: it's Physics for us grade 12's and mostly it is assignments which we would like to have access to computers to get more information in order to write them.

Nombeko: Currently, where do you get information that you use for your assignments?

Vuyo: Just general knowledge and of course our textbooks.

Ziya: We also do research where you are given a topic and then go find out information from encyclopaedia.

Nombeko: Where do you get the encyclopaedia?

Ziya: From the library.

Nombeko: Which one?

Ziya: The one in the township.

Nombeko: is that the only library that you use?

Ziya: no, we also use the public library in town.

Nombeko: Has anyone of you ever touched or worked on a computer before?

Ziya: I have used a computer before.

Nombeko: Can you tell me how you have used it?

Ziya: Uhm... we did intro on computers doing MS Word, Access, just the basics. It was just an introduction and that was it.

Zolani: I was taught how to log on and then to search programs and I did an assignment which I have forgotten what it was about but I know it was in Maths how to do maths using a computer.

Vuyo: I only used computers for fun eh... I use Google and the search for news about the stars.

Ntombi: I did typing, Microsoft, log on and log of and how to send.

Nombeko: How to send what?

Ntombi: Like to type up something and send it to someone else using e-mail.

Nombeko: Which of these computer programs that you have used, do you think would assist you in your learning?

Ntombi: I think it is e-mail and Ms Word.

Nombeko: Why do you think so? How would they assist you?

Ntombi: like if I want to communicate with someone in another country and I don't have means to go there, then I would send that person a message using e-mail.

Ziya: Like the Internet there are sites that you can look at and get the information that you need, like ja it depends on what you are looking for.

Nombeko: Which of you subjects or learning areas do you think you would understand better if you used computers to learn them?

Interviewees: Physical Science (giggle).

Zolani: It is really difficult and I think if we have access to computers things will be much better.

Vuyo: And also in Physics there are experiments which I think we would understand better if we could actually use computer program that would assist us. Currently we do not have any equipment.

Nombeko: if you had computers in your school, would you like your teachers to give you more work to do on computers?

Vuyo: No, because I think we must also use modern ways of searching for information and not lose the current resources we have but use them parallel.

Zolani: You must focus and use your brain and not depend on computers because you have been given a brain so that you can use it so if you do not use it, then what?

Ziya: Ja, I think eh... computers should be used to a certain extent so that your brain does not lose its ability. I have seen some people who were addicted or should I say dependent on computers let's say if they wanted to do accounting calculations they would consult a computer, for Physics they would consult computer. They were unable to use the knowledge they had.

Nombeko: What do you think are the benefits of using computers generally?

Vuyo: You are connected and you become open- minded.

Zolani: I think computers have lots of information that our school do not have and we also do not have facilities for doing Physics experiments. Like if you use a computer you see with your own eyes the whole process and be able to recall it during exams but if you are told by someone else that this is like this. You will never recall that when it comes to exam time. Maybe we would benefit more on computers.

Nombeko: What do you think are the other drawbacks or disadvantages of using computers?  
(Long pause)

Zolani: We will not actually know because we do not have computers we do not use computers. The only thing that we know about computers is that they are useful.

Vuyo: But, for example just generally I think you abuse anything that means you are doing something else, you are not using it for assistance but just abusing.

Nombeko: Would anyone like to add more on what has been said?

Vuyo: The only thing I would say is that I'm interested in pursuing a career on computers but now that I am not exposed to computers and have no knowledge of computers from lower grades. Is it possible for me to do such a course without the basics on computers?

Nombeko: Ingrid, would you like to...

Ingrid: It is possible; you do a four year course... (Text missing).

Zolani: For one to know the basics, how long does it take? Does it take months, years, weeks?

Nombeko: It depends on your ability and exposure to computers and so on who is offering; mostly it would be non-governmental organisations (NGO's) which would have certain amount to spend on a certain number of people for a certain period. So it depends.

Busi: So you (Nombeko) can you say you know a lot about computers?

Nombeko: (Giggle) I wouldn't say I know a lot but I can use it.

Busi: So you can teach computers?

Nombeko: Yes I can.

Busi: How far?

Nombeko: Eh ... how far? (Giggle) Ok, I can teach the basic stuff like most of the things that you have mentioned earlier.

Busi: If you are a slow learner can you cope using a computer?

Nombeko: You will be surprised to know that some people might be regarded as slow learners but when it comes to computers they have the ability to use them because computers are regarded as one of the glamorous things that can catch anyone's interest regardless of your pace of learning. So it is not about being slow or fast learner.

Zolani: Since our school is still developing and trying to improve our matric results, do you think Rhodes University can give us computers to assist in this venture to reach the 50% pass rate, because I think really computers are useful.

Nombeko: You mean access to computers?

Zolani: Yes, to be able to use them for our learning perhaps as groups.

Nombeko: Do you think computers have a significant role in the improvement of your matric results?

Zolani: Yes, I think computers are amongst the other things that could help.

Busi: Can you be wiser than computers?

Ingrid: (giggle) you have to be a man made computers of course you can be wiser, it is just a machine.

Busi: The reason for me to ask is because computers are about information so can't one have more information?

Nombeko: Yes you can because all the information that on the computer has been put there by different people it did not make it up all by itself.

Ntombi: Can I ask her (Busi) like the need for the computers as it has been said like if you have to talk to someone in another country what would you do?

Busi: So is it about e-mail only?

Ntombi: (giggle) it's about e-mail and all other things that can assist you as a person.

Zolani: As you (Nombeko) have said that the information is from different people and the all over and for me to access that information I need to search for it using the internet because the person who put it there might not be able to travel all the way maybe from America just to give me access to that information.

Busi: So I can be wiser than a computer?

Nombeko: Yes you can.

Vuyo: And also computers can make our lives easier just like this (pointing to the recording device) just imagine if you had to use the old model maybe it would have taken much more space but now it is simple. It really makes life easy.

Ziya: And also it helps with filing like in large companies there are many files and they can be loaded onto a computer then when you want that information, like Identity documents for instance so you can get information about you or a certain person, and the finger prints can be matched using computers. So it makes life easy.

Nombeko: Would anyone like to say more?

Vuyo: I would like to ask why you are doing this kind of research.

Nombeko: The project is about the integration of computers within curriculum in secondary schools but I am basically interested in what you as learners have to say about the use of computers and how they affect your learning.

Vuyo: What is actually the aim of doing this?

Nombeko: The main aim is to write up a report that would reflect your own voices as far as integration of computers into the curriculum is concerned. The findings and the recommendations would also be reflected in the report and the whole thing would be given to the education department to see what is really happening or to get some idea of the sample of data we have collected about the integration of computers in teaching and learning.

Zolani: I guess this is not the first school you have done interviews with, so let us say most of the learners see the need for the use of computers and the small percentage does not, do you think the department would consider giving schools computers?

Nombeko: I certainly do not know but hope that our research will actually make a positive impact.

Busi: Can I ask something?

Nombeko: Yes

Busi: If our school does get computers, is it allowed to for teachers to force us to pay for using computers?

Nombeko: Well, I do not think so but I assume it depends on ones school to the other like the reasons for paying.

Busi: When you were in high school, were there any computers in your school?

Nombeko: No, and it did not seem that we could have them in the near future.

Busi: How did you cope?

Nombeko: I coped very well because I was not exposed to computers to think that things could be much better or other schools have computers and mine doesn't. I did not have that kind of thinking; all I knew was that I have to study my books and passed every exam, and never failed a single grade. So I think it is about the changes, I thought you were bringing that up that it's about the changes that occur over time.

Zolani: It also differs from school to school because some people would say they want computers for their schools but when you ask for what then they would say that for their school to be glamorous. They actually do not know why they want computers and when computers are there in their schools they will be stolen, that's how Xhosa people operate (giggle).

Ziya: No, I do not agree with you it has nothing to do with being Xhosa or what.

Nombeko: It is not about being Xhosa, what it's about firstly is the values that are instilled in you as an individual and how these are enhanced at school and how to respect school property and its value knowing exactly why you needed that kind of property in the first place.

Nomhle: Computers are offered at Rhodes so if I'm interested in them then I can go and study.

Nombeko: Yes you can after you have passed grade 12 and study computer science.

Vuyo: How many points are needed to do computer science?

Ingrid: You do not need any points to do computer science, you just need enough marks to get into the university and do computers science and if you have not done it before and you are not going to cope for the first year then they put you on what they call a computer science bridging and they teach you very basic computer skills and then if you get 65% or something you can move to computer science (one) and then you continue to third year and get a degree in that.

Busi: So Rhodes University does not have computers that are kept somewhere not used, that can be used by other people who are not Rhodes students.

Nombeko: No, there are not, because computers are placed or installed in computer labs for all registered students to use.

Busi: You know, during Scifest Rhodes University lets us use computers and I would like to know if I cannot just go to Rhodes and use the computers.

Nombeko: You mean as a T.E.M. student?

Busi: Yes

Nombeko: No you cannot, unless your teacher has made some kind of arrangement with somebody at Rhodes, who has authority to bring visitors and let them use computers in one of the labs.

Busi: If one has never touched a computer before and at a later stage in life would like to use it, is it possible?

Nombeko: Yes it is possible if you can get someone to teach you the basics for example, there are teachers, grown ups like me or even older who get into computer training programmes like Khula project where mostly Maths and Science teachers get involved with. Most of these teachers have never touched a computer before. What I'm trying to say is that it is never too late even I, started using computers only in year 2000.

Vusi: How has the knowledge you have about computers helped you with your education up to this level where you are now?

Nombeko: By the way I am also a teacher so I would say as a teacher, the access that I have at Rhodes since year 2000 has helped me a lot because all my planning is typed and most of the activities for my learners are either with pictures from the Internet. I also think it is an advantage for my learners being in a farm school to have a teacher like me because some of them actually had the opportunity to use computers at Rhodes.

Zolani: Earlier on, you said that you went to a school that had no computers?

Nombeko: Yes almost all schools in the township did not have computers at that time.

Zolani: So, do you think your learners are interested or see the need for computers?

Nombeko: I would say so because they are interested in how I have designed some of their activity sheets and I tell them how.

Sino: At Rhodes, are there computer lessons offered to the public?

Nombeko: No that I know of.

(Pause)

Busi: In your research so far, is it mostly black or white learners who would like to use computers?

Nombeko: So far I could not say but would suggest that you patiently wait for my thesis and see my findings.

Busi: I mean as you see it now.

Nombeko: At the moment I'm not at liberty to do that...

Zolani: It's a secret (giggle)

Busi: The last time I used computers was in grade 6 and the only thing I remember clearly is the games.

Nombeko: Would anyone like to comment on that?

Ziya: I think if she cannot remember most of the things she was taught is totally her fault so like one must not learn to forget so I think that's the problem she has...

Busi: So you want to tell me if I ask you about what happened on the 2<sup>nd</sup> of March whilst you were doing grade 6, would you be able to respond to that?

Ziya: Yes I would if I knew that answer then what would prevent me from knowing it now. If I did not know it then and my teacher did not explain it to me then I would not know.

Busi: So you want to tell me you could remember as far as grade 1?

Ziya: Let me give you a perfect example like we just did in Biology angiosperms physiology and gymnosperms and I remember that from grade 6 it's just that there is more knowledge but it is built on what I already know.

Busi: So what you are saying is that it is not that you did not have any information you just added more on what you already have.

Ziya: When you were in grade 6 you were given information that was at the level of your ability at that stage so now you are given at a broader scale.

Vuyo: So, what I would like to say is that a human brain can store so if you know a theory and you understand it, no matter you did it in grade 1 if  $1+1=2$ , it will always be like that.

Zolani: Again I think that anything that is glamorous would be easy to remember like maybe in her spare time she played games and obviously she was relaxed and enjoying because games are fun so I would understand why she only remembers games she played.

Sino: Is it possible for the government like on the Internet to get rid of pornography?

Nombeko: I don't think so because like in schools maybe there is a rule that certain books are not to be used by learners of that particular school but I promise you there would be one or two learners who will be reading the prohibited material. That would not be principal's fault that such material is available at the school. So what I'm trying to say is that there are ways to

prevent children to view pornographic sites if the school can but if you are not within such an environment then you could have access to such information.

Sino: Is it illegal for someone to create such a website?

Ingrid: If it's child pornography ja.

Zolani: Can't the government have like a restricted area to prevent such people who create child pornography from exposing it to the public and maybe eh... why doesn't the government use its facilities to trace these people because it can trace other things.

Nombeko: Well, I think that entails a lot of factors like some people who claim that they have freedom to write what they like and maybe you could say that the government (seeing that you are making it the government's responsibility)... (interrupted)

Vuyo: We refer to it as the 'headmaster' that's why (giggle).

Nombeko: Maybe to prevent kids from accessing those sites but it is the very same... (interrupted)

Interviewees: It is the children who go out of their way to access these sites.

Ziya: I think teachers also have a role in the learners not having access to computers because where I was schooling in King Williamstown almost all schools have computers and like our school we did the intro in January 2003 and it was like in March when classes stopped and like the teacher who was teaching us was not sure about it, she was still learning and as she was teaching us it was a learning process for her and that was it. The computers were there for some of us to do our projects and stuff but computer classes stopped so I think teachers ja, because for I think computers are there then there should be someone to teach them to us.

Busi: To me it seems that since these teachers had little or no knowledge about computers, they didn't want to be embarrassed because you were young and obviously you would learn fast and maybe outsmart them.

Sino: Are computer viruses created by people or just occur?

Ingrid: They are created by people.

Vuyo: What I would like to know is that if you are using a computer, is there a possibility for someone somewhere else to view what you are busy with?

Nombeko: Eh... if you are about to enter any site there is a message that would pop up on your screen telling you whether the site is secured or not.

Vuyo: So if you are busy with your stuff (giggle) everybody can see it?

Nombeko: No, not if you are busy with MS-Word documents you do your own thing save it and it is for your eyes only if you choose to do so. Can we go back to the idea where teachers

did not make use of computers available at school? What do you think is the possible reason for that?

Ziya: Well, I think maybe teachers lack eh... maybe she was never taught to use it so as to be able to teach us but there were 31 teachers and I don't think there wasn't just one who would sacrifice maybe after school to conduct computer classes if all her periods are full during contact time.

Zolani: There is no teacher that would do that for free they want to get paid. I don't think anyone would on his/her spare time teach computer classes and secondly there are teachers who have these skills but don't want to share with others so that's where the problem is.

Nombeko: If there is nothing more to say, I would like to thank you for your time, input and cooperation.

## Appendix I: FHOR transcription

Interviewer: Nombeko

Interviewees:

Themba grade 11

Lunga grade 11

Linda grade 8

Busi grade 9

John grade 10

Mary grade 10

Vuyo grade 8

Cecil grade 9

Nombeko: How many learning areas or subjects do you have here at your school?

Vuyo: In grade 8 we have 9 learning areas

Cecil: Same with us.

Nombeko: Which of these learning areas or subjects have you done projects on?

Themba: Almost all of the subjects.

Nombeko: Can you speak about 2 or 3 of them?

Themba: Like wise in grade 11 we have done a project in BE [Business Economics] and History these two.

Nombeko: What about the grade 8's?

Linda: We've done our projects in Science and LO [Life Orientation].

Nombeko: Science and LO?

Linda: Yes

Nombeko: Eh... the grade 9's?

Cecil: Biology, LO, Natural Science, English, HSS [Human & Social Sciences].

Nombeko: Can you speak about one project and give me the details?

Vuyo: I'll speak for grade 8's. It was a project we were given like to solve, the problem was with our family members who keep on coming into our rooms like removing our possessions taking things that we don't want them to take. We wanted to make like a logic like an alarm system and the alarm system was used like must have two inputs like for instance when you open the door it goes on. So we, we used a cardboard and some wires and batteries and the

hooter. We connected in the cardboard and opened a space for a door in the handle and when you opened the door the alarm goes on and when open the window it goes on.

Themba: In BE it was stuff like to choose from like a variety of topics like business in South Africa like the JSE [Johannesburg Stock Exchange] the economy of the country stuff like that.

Nombeko: Okay, uhm... which of these projects did you have to use computers on?

John: In grade 10 Biology and Physics we did solvents and for Biology we like did it on species... (text missing).

Nombeko: Was the information you got from computers helpful?

Mary: Yes it was very much helpful.

Nombeko: What was the most challenging project you had to do using computers?

Vuyo: I'll speak for myself, I didn't find anything challenging because you just, everything you do like surfing into the Internet so I didn't find anything challenging.

Nombeko: Have you used computers for any other activity other than for schoolwork?

Vuyo: Music like downloading music to CDs and playing games.

Nombeko: Anything else?

John: Ja we use it for cartoons

Nombeko: To make cartoons?

John: Not make cartoons like dialogue in cartoons you know what I'm sayin (giggles) like cartoons.

Nombeko: I'm not actually getting you.

John: It's like when you see like in magazines or like comics. You surf the Internet and read.

Nombeko: All right, do you use that information for... languages or what?

John: Sometimes like some stuff you get from the Internet is like, some terms you haven't heard before and like sometimes is like there are some terms on the Internet that people don't like usually use.

Nombeko: Can you tell me about the computer programs that you can use?

Cecil: Encyclopaedia

Vuyo: There's another program that our technology teacher introduced to us. It's a program like you complete a circuit board you take a battery connect it to the bulb they try to light it then you have a battery and connect it to the bulb and make a switch and connect it to the bulb and then the light goes on.

Nombeko: Can you remember the name of the program that you used?

Vuyo: No I can't.

Nombeko: Is it only...that program?

John: Excell, MS Word, Internet almost everything.

Nombeko: How much time do you spend using computers here at school?

Vuyo: (giggle) for the grade 8s you wait until you get the period to use computers.

Nombeko: How long is that period?

Vuyo: 45 minutes.

Mary: Like for the grade 10s in our class we get computers as a subject because we do Maths and Physics so CAT [Computer Applications Technology] is one of our subjects we also get... (text missing) periods

Themba: We don't get to use computers at all.

Nombeko: So for grade 11s nothing.

Cecil: And the grade 9s.

Themba: We use it at home.

John: There are like classes after school.

Nombeko: Are there more learners who use this opportunity of having afternoon classes?

Themba: No.

Nombeko: What seems to be a problem?

Vuyo: The problem is that we are going home after school.

Themba: The software that they use, it sucks

Nombeko: What would you prefer then?

Themba: XP 2000

John: We do have XPs but there's like a risk in using XPs because most of the learners will like damage the computers you know what I'm saying.

Themba: How can you damage a computer when using XP?

John: The afternoon lab is like the downstairs lab and there's like no teacher to supervise some learners might take... like (interrupted)

Cecil: Advantage (giggles).

Nombeko: Do you think teachers should give you more work to do on computers?

Themba: Yes a lot more.

Nombeko: What would you like to do on computers that you are not able to do now?

Cecil: Learn how to operate a computer.

Linda: Learn how to type notes on MS Word.

Lunga: Yeah like teaching us how to like create a web for like business like creating our own for our own businesses.

Nombeko: What do you think are the disadvantages of using computers?

John: In the Internet like you get access to everything like pornography and stuff so it could be legalised that sites are made more safer on the Internet.

Nombeko: Are there other disadvantages?

Lunga: The eyes.

Mary: The syndromes you get from using computers like the injuries of the way you sit and the chat rooms on the Internet people get rude and they say funny stuff.

Nombeko: Would you like to say more than what I've questioned you about?

(Pause and whispering)

Nombeko: Maybe on how you can use computers more.

John: More use of computers in subjects like in all grades

Nombeko: From grade 8 to...

John: Grade 12 yes

Nombeko: So it's only for grade 10?

Themba: Ja

Mary: It's like it goes with the subjects you choose because like some children in our class chose Maths so those subjects go with computers as a subject.

Nombeko: Which subject or learning area do you think will be easier for you if you used computers?

Themba: Accounting and English

Nombeko: Accounting and English? What seems to be the problem now that you don't use computers?

Themba: In English notes, the type of words we get.

Nombeko: So it's actually the vocab that is used so you will get more by using computers?

John: For poetry and stuff.

Nombeko: For poetry?

John: Like finding out what theme it is about and stuff (giggles).

Nombeko: And for Accounting?

(Pause)

Lunga: It would be easier.

Nombeko: What is difficult now?

Lunga: Nothing much.

Nombeko: Nothing much but you would like to use computers.

Okay then thank you for your time.

## Appendix J: FMC 1 transcription

Interviewer: Nombeko

Interviewees: \* John, Bonga, Jerry, Paul, Brad, Luke, Nick, Donald & Peter

\*Not real names

Nombeko: Can everybody tell me the first names and grade you are doing?

Interviewees: John in grade 9

Bonga in grade 6

Jerry in grade 8

Paul in grade 11

Brad in grade 10

Luke in grade 7

Nick in grade 7

Donald in grade 6

Peter in grade 9

Nombeko: Those of you who have filled in the questionnaires, you have all indicated that you have used computers at home and at school. Do you think that if you use computers at home, is that giving you some sort of a platform or ability to use computers at school?

Interviewees: Yes definitely.

Nombeko: How?

John: Basically first of all at school they don't have to teach you the basic stuff how to click and hold a mouse etc. So basically when you start off you basically know what to do so you have a foundation how to get there so you have a basic you don't have to start from scratch.

Nombeko: Which learning areas or subjects have you done projects on? I'm sure there's a lot.

Interviewees: Science, Maths, English, History, Geography and Art.

Nombeko: Did you use computers on some of them or on all of them?

Interviewees: Most of them.

Nombeko: Can anyone tell me about project that you used computers on?

John: Basically we did something on career guidance. That is s programme at school that's basically on how to choose our careers, what criteria you have to live up to certain people like lawyers etc. Ja, we did something like that in Life Orientation in grade 9.

Nombeko: Uhm... you have mentioned quite a lot of programs that you can use. I'd like to know which programs have you used, (pause) computer programs.

Interviewees: Microsoft Excel, Microsoft Word, Encarta, Microsoft Publisher, and Acrobat.

Nombeko: How do you use these programs?

John: Easy, well basically we get taught how to use them by our teachers.

Brad: Like Power Point for presentations, Word processing we use for word.

Nombeko: Gathering from the questionnaires, I've seen that you mention Computer Science, Life Orientation, Science and History as subjects that you use computers in. What about other subjects like English and Maths?

Nick: No, not Maths (giggle) you can't use computers for Maths.

Donald: You can use computers for Maths you can. You can use it for graphs and add things. We have a program in the computer lab there so that we can do Maths.

Nombeko: Which program is that?

Donald: It's called the 'cruncher'.

Nombeko: The 'cruncher' aha...

Donald: You can put numbers in and add horizontally and vertically, things like that depending on what you need to do.

John: The school advertises some Maths programs that they sell to us basically the... (text missing).

Nombeko: Ok, do you think that if you were given more time to use computers would that be effective for your learning?

Donald: Ja, because you get bored of using what you normally use, you need to explore and not use one thing over and over again.

Nombeko: One of you on the questionnaires mentioned that computers should be available in public places where most people would have access. Do you think that would have a contribution?

John: Yes, it would if it's for free like there are cafes.

Brad: Use them for free and abuse them (giggle).

Nombeko: You have indicated that computers enhance knowledge and I'd like to know how they do that and what type of knowledge?

Brad: General knowledge from the Internet and basically you can find anything because ja it covers...

Jeremy: You can manipulate the computer to suit your needs so you can get what you need so to improve your knowledge how you need it.

Nombeko: Do you think using computers will improve your learning?

Interviewees: Definitely yes.

Nombeko: How so?

John (giggle) Getting all the information I mean eh... you basically focus on it and you're reading it so as you are reading it you are taking down knowledge so and like www too you don't have to leave your home and go to the library to find out. I mean if you have a project due tomorrow or anything you can get at least some basic knowledge, like compile something out of it you see.

Nombeko: What do you think are the disadvantages of using computers?

Interviewees: (Giggle) Addictive everyday computer games.

Jeremy: Restrict yourself to one source and don't get a wide variety. If you use computers a lot then you only learn about what programs on the computer tell you, you get different people and different things and different ideas so you don't really get a wide variety that much just using a computer.

John: And most probably games (giggles) you can easily get addicted I mean sometimes you're doing work on the computer and decide to have a quick ten minutes rest play a game and you play it too loud, you can abuse it if you are one of those people who stick to one game.

Brad: Ja and also you keep upgrading your computer it costs a lot of money.

Nombeko: Ok then that's about it, thank you for your time.

## Appendix K: FMC 2 transcription

Interviewer: Nombeko

Interviewees: \* Anna, Connie, Steve, Mark, Andy, Kobus, Jan and Amos

Nombeko: Can we start by introducing ourselves; anybody can start just your first name and the grade you are in?

Ek is Anna in graad 11

Connie graad 10

Steve graad 10

Mark graad 11

Andy graad 9

Kobus graad 9

Jan graad 8

Amos graad 8

Nombeko: You have all indicated that you have used computers at home and at school and I'd like to know if that has given you sort of a platform or more knowledge on how to use computers here at school?

Mark: The use of computers at home are much better than the way we use them at school because at home you fool around computer using the Internet look for stuff you can download music whatever but at school you have to do something you have to learn Excel or Word uhm... for other outside school activities you do a specific thing like research on a specific subject not just... you cant fool around but do what you actually have in class.

Anna: My learning is at home, it's like a platform to basics but when you come to school you've got certain skills that you advance and try to excel on that.

Connie: The main thing that you actually learn the basics depends on the programs the computer use so I'd say the computer at home is just like formal basic of what you do at school.

Kobus: And also what you learn at school you can use at home for example, using Excel you can use to help your mother and father to... (text missing) so uhm... using computers at home improves your skills at school because you get the opportunity to practice.

Nombeko: Which learning areas have you done projects on so far?

Mark: All of them (giggle) it depends on what you going to research on because if you research on something simple you don't use computers unless you want to type it out but when you want to research in depth then you go to the Internet and use programs like Encarta and download programs. So computers are much more luxurious than going to the library, it's much easier.

Anna: I'd definitely say going to depth you just want to know more uhm... you're doing research on something.

Nombeko: You mentioned quite a lot of programs that you can use; can you elaborate more on one or two? What do you use them for?

Mark: Word is probably the most common because you type a letter, your write ups but then it's also there's a lot of stuff you don't know about there. You don't use it like programs that are simple but then there are some more complicated programs I don't know about. Excel is much easier for me but Power Point is sometimes difficult. Access is difficult sometimes but ja we all learn them at school and go and practise at home increase knowledge by fooling around and discovering things basically.

Anna: And also we had an advanced certificate in computers study for basic components of computer it's just uhm... so that when we compete internationally we would be on the same level as people in Europe maybe.

Teacher: What's that certificate?

Mark & Anna: ICDL.

Nombeko: My next question is based on that, I have noticed that most of you mentioned Information Technology, Computer Science, Computer Literacy, ICDL as the main subjects that allow you to use computers. What about other learning areas or subjects?

Anna: Well... uhm... they've created a program uhm... for primary school that helps them in Maths, in spelling and all sorts of things but they haven't developed one for uhm... high school so we haven't got like programs that help us actually we're just doing it ourselves.

Mark: We've got we've got programs like you have to buy them yourself all that stuff like Master Maths that you can use computers on and then but then at school they don't have programs about Maths on the computers itself for the little children that help them with spelling and Maths uhm... (text missing) high school.

Connie: If you want to use computers uhm... in other subjects you have to be uhm... like if you want to draw a chart for Biology or English or something they don't give you the time to do it here at school.

Kobus: Also there's a lot of websites on the Internet that help you with English especially if you have Shakespeare plays that you study, there's lots of notes on the Internet that can actually help you more than what you learn in class.

Nombeko: Ok, what you are saying is, you would like to use computers to learn other subjects?

Mark: Yes, we can actually after school we've got a specific timetable to, you can't just come here if you've got English unless the whole class has permission to come here but that hasn't happened before not as far as I know.

Kobus: And also most of the textbooks that we use are a bit outdated so if you do research on the Internet when you use computers you get more recent material on that subject that you are trying to get information out.

Nombeko: One of you said that computers should be available in all classes where subjects are given. By that you mean, do you want computers installed in each classroom?

Mark: It would be much nicer but not possible at school. It's too expensive and ja it would be a nuisance because if I've got a computer in front of me in English I won't do English. I'll go to the Internet if I can or play games or download music without them knowing, so I'm not gonna concentrate so if I've got a book in front of me, there's nothing much I can do except maybe draw pictures but that's a consolation.

Teacher: You see he wants to get at that each and one of them must have a laptop (giggle).

Connie: If the teacher wasn't I mean if the teacher is in front of the class and the computers facing that way (opposite) so she can't see what you're doing so you might as well play games instead of listening to what she's saying.

Mark: Well we've got computers here if all the computers are in one line she doesn't know what are we doing in the computers sometimes she's gonna catch us on the master computer but if you download music she takes the music programs off but we still play it for ourselves.

Nombeko: Most of you believe that computers develop skills. What kind of skills? Can you take me through?

Mark: Hand eye coordination, not literary but your fingers are much, when you start with computers your fingers are really bad but then after a while playing around, your fingers become quicker and type sms easier and you play with little stuff like working with a needle and you're much more precise.

Kobus: Also improves your memory, you don't learn that in Microsoft Word you have to go to format font to change the font of text so you start to remember where things are and that improves your memory over than in general.

Anna: Also we try to get that state like before the computer you see when you're doing something you say I wonder what will happen if I do this, you see, so...

Mark: Or you see something new, you want to try it out then you see when something pops up you say oh...

Connie: We develop our own world.

Nombeko: What do you think are the disadvantages of using computers?

Mark: Sites that are not authorized and you get yourself into nonsense if you copyright, there uhm... that's the biggest problem, I think because most children go to porn sites which are a big problem. They go to Yahoo or wherever they can download music and that's against the law in South Africa so...

Connie: Or physically I mean physically about your body and stuff if you don't sit up straight in front of a computer, your back is gonna give you problems or your eyes would start you know you'll have to get glasses or contacts or something because of the screens so it depends on which way you go.

Mark: And some people with academic subjects like Science and other stuff, go completely to waste because they spend too much time in front of a computer so they don't study, they don't have a social life and that's especially on the academic side it's huge... (text missing) at school it's nice to play with computers but 20 years after that you're gonna be spiteful you're gonna be not spiteful(giggle).

Connie: Sorry

Mark: You are gonna be sorry ja.

Kobus: And also you get addicted to sitting in front of a computer if you do it more often it's bad for your health, you have to get out sometimes out of the room outside.

Connie: Also like you tend to get lazy, computers they... (text missing) book.

Mark: And there's something we don't know or we don't see, is radiation that it gives out I mean I don't know how many brain cells we're burning everyday we're sitting in this

computer room so I mean that's bad as well and it might affect you in the longer due. That's probably the worst.

Nombeko: Is there anything more that you would like to say?

Mark: Computers should be actually cheaper (giggle).

Nikiwe: Can I ask a question? I just see a clever class here some learners that can be able to manage themselves in the computer room. Do you think there's still a need for teachers to be there?

Anna: Oh yes, especially for the people who doesn't know anything about computers we can't teach them so at this stage the teacher knows more than we do so obviously...

Mark: The only reason why we can work on computers is because somebody taught us and I've started with Future Kids down at the bottom and I think it was in standard 4 that we started and that's 4 years ago and if you do same stuff for 4 years over and over you just learn something new every year you are bound to improve at home by fooling around well I've improved the most by going on to my computer and just playing and just discovering things you remember those things because you found them and that's how is studying.

Anna: When I came here in grade 6 and I've never used a computer before but after 3 lessons I was like gee this teacher is good hey I didn't know anything about a computer but look at me now like I don't need anyone to like look at me when I do stuff I just do it and curiosity also, I think a teacher knows this much I think, so I think we really need someone there to monitor.

Kobus: Also teachers have experience in what they do so, they actually physically show you what to do. The computer can only give you text and some notes and tell you, you have to do this and that and the teacher can show you and by showing, you can remember things well.

Nombeko: Okay, if there's nothing more to say, thank you for your time.

## Appendix L: FMC 3 transcription

Interviewer: Nombeko

Interviewers: Grade 8-11 learners

\*Not real names

Nombeko: Can you tell me about the projects you have done eh... that you used computers on? Take me through just one or two.

Linda: We had one about heritage we had to say something about heritage day eh... what you inherited ... we had to plant...and type up our observations.

Jane: In grade 10 we had a project about the heart disease

Lumka: The grade 11's we had a science project we had to have experiments and after that type up a report and some entered the Science Festival with those projects.

Nombeko: In the questionnaires you only mention Maths as a subject or learning area that you use computers on for your learning.

Cindy: They offer CAMI eh... we don't do projects in Maths well...the grade 10's not yet.  
(From the first interview) Those who do CAMI maths said that they come to the lab wanting to know answers but instead they get out more confused.

Brenda: Well the grade 8's ...projects some of us type it up but it's not compulsory to use it so some of us use it.

Jane: In a way we use it for other subjects like Encarta to search information.

Lumka: And also typing tutor to improve your speed.

Nombeko: On the questionnaires someone mentioned something about computers being the learners' comfort zone. What do you mean by that?

Linda: Seeing as we all like...it's like we are comfortable with computers because some of us love computer games and like you know I think it's because it's brighter ... like Encarta when you're searching for something you just type it up and search for it... it's an easy way to get...

Jane: Also...

Nombeko: Do you think if you had to communicate using computers to your teachers through e-mail do you think that would make a difference in your learning?

Linda: Not really... I don't think it would make such a difference or easier for everyone...

Lumka: It's also a disadvantage because sometimes you just have lots of questions to ask and you know like when you are... at times you forget some things and...

Linda: You need somebody there to explain some things.

Lumka: You need someone to ja exactly physically not a computer especially with Maths.

Nombeko: Are there any other drawbacks of using computers?

Linda: You get like lazy but not really lazy it's like you know when you write stuff down it's much more easier it's not easy as such but you... when you are sitting there and it comes out...

Lumka: And you also find...

Nombeko: Which learning areas or subjects do you think you would understand better if you used computers?

Pam: Science it's science because it's like it has got this complicated language and if it could be less complicated and a simple language used it would be much better.

Ok thank you for your time and participation.

## Appendix M: IS 1 transcription

Interviewer: Nombeko

Interviewees: Thandeka, Michelle, Jimimah, Debbie, Kirsten, Carmen, Canon, Georgia, Bella, Sarah

Nombeko: Can we start by stating the grades that you are in and maybe your first names?

I'm Thandeka and I'm in grade 9

I'm Michelle in grade 8

I'm Jimimah in grade 8

I'm Debbie in grade 11

I'm Kirsten in grade 11

I'm Carmen in grade 12

I'm Canon in grade 12

I'm Georgia in grade 9

I'm Bella in grade 10

I'm Sarah in grade 10

Nombeko: Which learning areas are for the grade 8's and 9's?

Carmen: That we use computers on? Uhm... geography and... you mean subjects?

Nombeko: Ja

Carmen: Geography, English, History uhm... we use it for all the research.

Nombeko: What research have you done so far?

Canon: Well you mean like an essay and finding information look it up the Internet like music for (text missing) and for those other subjects ja.

Nombeko: And for grade 10 and 11's?

Debbie: We mainly just use it for essays and if you do computer science then obviously you use computers a lot.

Bella: In Biology we do research like a topic and write it up on Word and we also use it for IT

Nombeko: Can you tell me more about IT?

Bella: It teaches you how to use excel, word and power point

Georgia: Only when you have ICDL

Nombeko: What is ICDL?

Georgia: I don't know what it stands for

Carmen: International computers drivers' license

Nombeko: On the questionnaires you mentioned that you use computers both at home and at school, do you think that using computers at home has given you some kind of assistance?

Kirsten: Well yes, yes it definitely has given assistance in research

Nombeko: From the response you gave me on the final question of the questionnaire, you have mentioned that there is not much time or enough time spent in using computers in all learning areas

Georgia: (text missing) computer room the Internet takes a long so it's a mission

Nombeko: You then find it difficult to use computers?

Sarah: No, it's only that there's not much access when you've only one in the whole house, we can go to the computer room

Nombeko: How much time per week do you spend in the computer lab?

Debbie: About ten minutes (giggle) I only use the computer to if I have an essay that I don't feel like writing by hand (giggle) then I'll go to research stuff but it's not that often , I don't really like computers though (giggle)

Michelle: We have like a maths lesson in the computer room where people make shapes every week

Nombeko: Not for any other learning areas? Just maths?

Michelle: Well sometimes for researching and stuff like geography, history...

Nombeko: What is it really that you do in maths?

Michelle: We like make shapes or do graph (text missing)

Nombeko: What other research have you done?

Carmen: For what subject?

Nombeko: Any subject

Jimimah: Ja well we have

Nombeko: Can anyone take me through on just one?

Sarah: Encarta, it's like you get information with it

Georgia: And for English if you need a book you go to Google

Nombeko: Right, what would you like to spend time doing on computers?

Debbie: As little as possible (giggle) they always do their own thing and delete all my work (giggle) I'm not a fan

Nombeko: So you don't like using them?

Debbie: I prefer not to, I don't mind and I'd rather not. I'm not like one of those people that go and spend like 2hours playing games

Carmen: I do it makes life easier

Nombeko: Ok, most of you have mentioned that you use computers to search information to search information, what kinds of information have you come across?

Canon: Like for... that really depends on what your title is, like for geography we had to do a project on Coega like the various stages (text missing)

Nombeko: You also have indicated that there are programs that you can use. Could you say more on that?

Carmen: Well I think it's mainly Word and some of us use Excel, I know I use if for like when I draw up a list I use Excel. Word is the most popular one like everyone is using it to write essays on

Kirsten: And power point

Nombeko: What do you use power point for?

Kirsten: Like presentations, slide shows

Nombeko: T what extent do you think computers help you at school?

Sarah: They expose us to easy quicker ways to find information like the Internet

Carmen: It also exposes to greater scope of information whereas in the textbook you are limited to just like a certain section but when you go to the Internet it's like ja just wider

Canon: (text missing) set of books we like we have a teacher explaining certain things (text missing) get different people's views on it that really helped a lot because people can put tings more simply than (text missing)

Kirsten: Like with essays you can have you can get information from all different sources and put it on one page and then make your essay from all of those sources ...(text missing) one person's point of view in one page

Nombeko: Someone mentioned computer studies?

Carmen: That was probably me

Nombeko: Can you tell me more about that?

Carmen: Ok, I did computer science for half a year beginning of grade 10 and we used Delphi mainly and I just (giggle) you know I just couldn't understand a thing so uhm... I changed to biology so that was basically my experience with computers (giggle)

Debbie: Lots of boys do computer science

Canon: They are usually quite clever (giggle)

Nombeko: Ok, Is there anything that you would like to say more?

Cheryl: Can I pop up a question from the back here the peanut gallery eh ... I'm very pleased to hear that there are people who don't like computers, uhm... What are some of the disadvantages? We talked about all the advantages of using computers are there some things that are disadvantages the drawbacks on using computers?

Debbie: I always find that like people always have to continue be getting their computers upgraded because you get the latest but in month's time it's you know it's old and...you have to do it again extend it.

Kirsten: And also you get used to writing essays quickly and you're like thinking you just think and write and you can always go back and change whereas in exams you can't do that. You actually got to learn to process your thoughts before you write them down you've got to do it quickly.

Cheryl: That is a really interesting point.

Kirsten: You've got like to time yourself you learn to write by hand if you do everything on the computer.

Bella: (text missing)

Sarah: When a printer doesn't work and you need to... (text missing).

Canon: ... (text missing) expensive.

Carmen: And like plagiarism is like eh... like quite a big problem 'cause people just co... just paste and copy so easy.

Cheryl: Ja, ja these are very interesting points you're coming up with because I think you are some of the first people coming through schooling with computers as major part of your schooling I mean like us oldies I mean computers haven't been even created.

Debbie: We've had computers in classes since we were like in grade four or something.

Cheryl: So it's something you're familiar with?

Debbie: Ja

Cheryl: Now some of you mentioned that there wasn't enough time if you were to need to use computers what would you want different in the environment? Would you want computers in

your rooms? Would you want computers in your boarding houses? Where would you... what would you want differently that would actually make your lives easier?

Carmen: I think definitely more computers in the house, at the moment we've only got one. Some houses have got three like we need a lot more I think at least ten in the house.

Canon: And more than one printer... (text missing) (giggle).

Cheryl: Alright enough questions from the peanut gallery.

Nombeko: Ok, if there's nothing else thank you for your cooperation.

## Appendix N: IS 2 transcription

Interviewer: Nombeko

Interviewees: Kyle –Grade 12

Beki – Grade 11

James – Grade 9

Nombeko: When you first started using computers, way back many years now, what were you using them for?

Kyle: I started using them when I was young, so it was mostly games. It was only really when I came to say Grade 8 that I started using them for work.

Nombeko: When you say games, what kind of games were they? Ordinary ones that come on Windows?

Kyle: Ja, Solitaire, I like Solitaire.

Nombeko: Beki?

Beki: When I started using computers I was using them mainly for games and stuff. My main games were Minesweeper and Solitaire and some other DOS games.

Nombeko: When did you first start?

Beki: About 1995, 1996.

Nombeko: How old were you then?

Beki: I was about five or six.

Nombeko: Sorry Kyle, I didn't ask you. How old were you when you first started using computers?

Kyle: I must have been about nine or ten.

Nombeko: And James was games your first experience too?

James: Ja, in grade one and two we used to use our Apple computers and we used to play those...I don't know... I can't remember what games were on then, but then when they opened the new IT centre in grade four and we started playing more higher grade games like Delta Force and those kinds of games. In grade five we started using computers for writing stories and stuff, just learning how to type and right from grade five we used to have a computer lesson and we used to do a programme called "Type Quick". It was to learn how to type, that's basically it.

Nombeko: How good was your speed?

James: Not too good.

Nombeko: Do you think it helped you?

James: Ja.

Nombeko: What did it help you with?

James: Getting to know the keyboard, learning where they are.

Nombeko: Kyle, now that you are at the senior school, well, you are virtually out of the senior school, what are you using computers for mostly?

Kyle: Mostly using Word to type out essays and to get info for projects. So far I managed to recently hand in a geography project about diamonds. So I did find quite a lot of info on that.

Nombeko: And when you are looking for information, what kind of programmes are you using to do that?

Kyle: Search engines like “Yahoo” and “Google” and “Encarta”. Mostly those.

Nombeko: So you have “Encarta” on the server here at the school.

Kyle: Yes

Nombeko: So it’s between Word and the Internet, is that basically covering what you are doing, what you are using computers for.

Kyle: Ja, I don’t do computers as a subject, so I don’t really go into all that stuff.

Nombeko: I’m particularly interested in how you are using it for other subjects, but I’ll get back to you on that one. Beki?

Beki: I do computers as a subject so I spend quite a bit of time at the IT centre, typing programmes and stuff. But then, most of the time I’m doing ITLU, I’m doing research and typing essays as well, like Kyle said. Last year I used to spend most of my time doing physics research because we used to do notebook inspections for physics, so we had to get some information and put into our book and produce it and get a mark for that.

Nombeko: And what kind of programmes were you using to do that? The same as Kyle, search engines?

Beki: Mainly Encarta, but then I use search engines especially.

Nombeko: Which is your favourite one?

Beki: Probably Ananzi and Google.

Nombeko: James?

James: I used to use it for getting information and then putting it into ... for projects and like for science, where I get information and put it into our books, because we also have book

inspections. So we're just, not just doing work like in the book, but getting extra information. For search engines I basically use OSG (?) is quite a good one and Google.

Nombeko: OSG is actually quite fun- it sometimes puts in answers that I think are pretty more understandable for younger people than some of the others, such as, you mentioned, Google for example. Some of you mentioned, it might not have been you, on the questionnaires that you felt that using the Internet could make people lazy, because people were just cutting and pasting information. Do you think that's a fair comment Kyle?

Kyle: I think it's very fair. I'm sure there are a lot of people, especially at senior school, who do that. They just think that because they leave their homework for the last night, and then they just go and cut and paste.

Beki: I think the Internet may make them lazy in a sense that they probably don't get out there and do as much research as they should be doing, maybe in the library, and the library is quite good because it helps you develop your reading, but I mean, the Internet is good in the respect that it helps you learn how to use a computer. I don't think the Internet is the real cause of copying and pasting.

Nombeko: What do you think the real reason is?

Beki: I just think that maybe people don't know how to do their work.

Nombeko: So it's a resource that's there, but it's actually people's laziness that's making them use it. Interesting point. James, how do you feel about that, does the Internet make people lazy, or are we lazy and the Internet is just giving us a way not to do the work?

James: I think people are lazy and they use the Internet, but I also think that the Internet has got a lot of advantages so, I don't really think... it's a big issue that people just copy and paste, I don't agree with that. Ja, I think people are lazy and just don't...

Nombeko: Kyle, with subjects, you mentioned earlier on about a geography project. If you had to take a quick snapshot of this year and think back, which learning area or subject have you used a computer in the most? Is geography the subject in which you've used the computer most often, or is there another subject maybe demanding computer work?

Kyle: No, I think geography is probably the most, because it was quite a big project. But it's also English and Afrikaans essays that we have to type out. I've actually just done my Afrikaans essay. Ja, I'd say those three subjects, English, Afrikaans and Geography.

Nombeko: But you do use it in other subjects as well?

Kyle: Physics, not so much, we don't really have notebook inspections in matric. I do accounting- I have an accounting project coming up so I'll probably use it in that.

Nombeko: And for accounting, what project would you be using?

Kyle: I think it's also written out work...

Nombeko: Oh, like an essay. So you're not using something like Pastel?

Kyle: No.

Nombeko: And your subjects Beki, which one do you think uses computers the most?

Beki: Well, besides computers, I think probably my favourites take up most of the time, because usually I'm doing extra research if I maybe don't understand something, and then I'd say English, maybe typing something out, because we get a lot of stuff.

James: Once a week and sometimes more often, for Xhosa, we go to the labs because there is a Xhosa programme on there and you do grammar and all those kinds of things on the computer, so there's actually a programme on the computer. And then, we also get like, recently we had to do like a programme, like a grade nine portfolio and you had to do brochures of your holiday place and ja, we had to do that all in Xhosa, so ja, Xhosa's quite a big one and then basically it's pretty general. Every now and then you go to the IT centre to do that. You do, like for most subjects you have to do something.

Nombeko: Kyle, do you think you could be using computers more effectively in the subject areas, you mentioned now, the geography project. Are there other areas where you are sitting in the class and you're thinking I could actually do this on a computer; because it would be very useful if I had a computer to do this... are there instances where you think you could be using computers more often in learning areas?

Kyle: I think subjects like geography and chemistry, where you write out notes, I think a computer would be quite nice, just to type it out there, it would be nice and neat and quite easy to work on.

Beki: Mainly in maths it would be a good one. Because I think a lot of the time you can do drawings on the computer. Maths is sort of applied so if you can use that to make... Because maths is mainly different sciences or like symbols and stuff, it would get you using the keyboard a lot more than it would for any other subject.

Nombeko: You would just have to learn some special characters.

Beki: Which would show you how to use other parts of word.

James: I think if you had computers in the classroom, it would save quite a lot of time. Say you have to write it down and then type onto a computer anyway, so it would save quite a lot of time because you would find other time then you would generally... So ja, it would save time.

Nombeko: Kyle, if you had the power to decide on how computers should be used at Kingswood, you have the power, you have been designated to be the decision maker on this aspect, what would you recommend, not just to the headmaster, but to the governing body. How do you think computers should be best used at Kingswood?

Kyle: I would say make like certain hours, work hours and not some others, not as much, but like gaming hours, fun hours. Maybe one or two a day. Here at school we are not allowed playing games. We were allowed but then things just got out of hand so ja, I think a lot of people miss games here, especially at our school.

Nombeko: And when you're talking games, are you also talking about things like downloading music and all those kinds of things, or do you mean just games?

Kyle: I think you can download music on our computers, or we have music on it at least, so ja, I'd say...

Beki: I think maybe computers would be more effective in the hostels. At the moment we don't have computers in the hostels and when IT is closed, you can't look up something late on the computers because it's just not available.

Nombeko: Good point.

Beki: Maybe by doing that it will make people more willing to use a computer in other aspects of school life and maybe diversity from just a single subject to a broader band of subjects.

James: I think Beki's point is quite a good one. Also, the grade 8's and 9's aren't allowed to go onto computers after five o'clock and sometimes our sport only ends at five o'clock so I can't actually get on to a computer and I think it's a matric privilege to go during prep, to the IT centre, I think maybe if there was someone monitoring the computers,... or even having them in the hostels. But then also, have a few computers in the classroom.

Nombeko: So it seems as though, if I'm understanding your comments here, is that you feel you would be using the computer more, but there are some things that are hindering. Perhaps, are there some other things that you feel are hindering, the fact that you've mentioned already, the fact that you've only got the IT centre and you don't have computers in the hostels is one issue. Are there other issues? Timing you've mentioned as one, are there other issues from your perspective, things that are hindering you from using a computer as you would like to?

Kyle: As I don't do computers as a subject, during the morning, say when I have a free period, there might not be a lab open as there are classes are in there, and we don't have any computers in the hostels and stuff like that, do I think it's hard to find time to go into labs.

Nombeko: So, if for example, you had a couple of computers in each of the hostels, would you be allowed to go back to the hostel during your free period.

Kyle: Ja.

Nombeko: So that would be a possibility. Interesting point building in Beki's idea. Are there other hindrances Beki, in terms of your need to use computers more?

Beki: Not really. Maybe it's just the fact that we don't get as many projects as the matrics do, when you actually start using computers a lot, it's not something you progress into, you are able to find that time when all of a sudden you have to find that time, so that is obviously a problem.

Nombeko: Do you think the teachers are aware of that issue? Do you think they know that?

Beki: I think they are aware that we don't have time. I think part of that is because the school's sports programme and stuff. Most of the teachers are aware of it, so I think that's another reason it hinders them from actually giving us these projects to do because they feel it might be too much because if more than one person gives them a major project to do I think, ja, it will sort of build up and people will end up not being able to do their work.

Nombeko: But you make a point well I think, that is a skill that you develop over a while, and just to try and learn it all in matric is rather a hard one. Any other additional points James?

James: No. It's basically just time.

Nombeko: The timing. Yes, I think your point there is that the time you have available, you can't use it. There is actually a real problem.

James: There is a reason why we do get logged off at that time, because people just want to check their mail so ja, I suppose you've got to earn it.

Nombeko: But those are some of the issues that are hindering you in using computers?

James: Ja.

Nombeko: Is there anything else you would like to tell me about computers at your school, something that is of concern to you, or something that might be interesting, that I perhaps haven't asked yet? Any ideas you've had about computers that I haven't perhaps asked about tonight?

Beki: I think what would be nice probably is to get, try and get more people into the IT centre, like maybe what Kyle said, by introducing games or something or certain courses you could do, that would actually benefit you after school. Besides your normal subjects, like extra courses that might benefit you in the future if you had those things. People are getting into the IT centre and they can actually do more work and in that way, maybe be better off in a sense.

Nombeko: Can you give me an example of something perhaps?

Beki: Maybe like a secretarial course or something. I know they offer an ICDL course as well, which was a very good thing. Maybe other general courses like that would help you to polish up on a certain programme. It would be nice if there was someone there who was able to offer those things to the students.

Nombeko: Like making your own webpage or possibly specific programmes that you may not have used. Even at university people have a need sometimes to have specialist courses. All of us don't use the programme, even Word or Excel, or PowerPoint, we don't even use them to the extent that we could and sometimes especially new ones have so many features you actually need somebody to show you because otherwise you may stumble upon it by accident.

## Appendix O: IS 3 transcription

Interviewer: Nombeko

Interviewees:

\*Not their real names

Charlie grade 11

Kenny grade 11

Martin grade 10

Charles grade 10

Rob grade 8

John grade 8

Grant grade9

Nombeko: When you first started using computers, what were you using them for?

Interviewees: Games, playing games.

Nombeko: When you say games eh... what specific games were you playing?

Grant: Solitaire.

Martin: Rugby like sports games.

John: Racing.

Nombeko: Which were your favourite games?

Charles: Rugby.

Nombeko: I assume that you've done projects on different subjects and I'd like to know how many of these projects required you to use computers?

Interviewees: On most of them.

Nombeko: Most of them, then how did you use computers?

Charles: Research.

Grant: PowerPoint.

Kenny: Word.

Nombeko: And out of these programs that you've used which one most helpful?

Martin: The Internet and Word.

Nombeko: How did Word help you?

Martin: Word, it helped you being more neat in projects and ja.

Charles: As well as spelling.

Nombeko: Which other program can you use?

Martin: Excel.

Grant: PowerPoint.

Nombeko: What do you use PowerPoint for?

Grant: Slide shows and presentations and like that sort of thing.

Nombeko: Do you think that programs that are available at your school cater for all your needs...

Martin: Yes.

Nombeko: In terms of learning the different subjects?

Martin: We've got like different types of programs for each subject like multimedia programs.

Nombeko: Can you mention them?

Martin: Multimedia science school.

Nombeko: How does it help you?

Martin: It's got all the different sections that you need and there's summaries ja of all sections.

Nombeko: Some of you mentioned it might not have been you, on the questionnaires I sent last year that computers are an obstruction, they prevent people from learning on how to use information, they promote plagiarism and laziness. Do you think these are fair comments?

Interviewees: Ja.

Grant: Not always because I mean it helps you a lot like some people use computers to learn and ja some don't.

Nombeko: You nodded (referring to the other interviewee).

Kenny: Well I think the basic problem is that it makes it very easy to copy and just paste.

Nombeko: If you had the power to decide on how to use computers here at (IS3). What would you recommend?

Martin: What do you mean? Like work, games.

Nombeko: How computers should be used best in (IS3)?

Grant: Use for like presentations.

Kenny: Obviously first computers should be used for schoolwork and all of that. And also the hobbies such as searching and stuff such as playing games.

Nombeko: Is there anything more that you would like to say about computers, something that may interest you maybe I didn't ask about?

Kenny: Computers make stuff easier at the same time they can make one huge mess if it doesn't save or gets corrupted.

Nombeko: Would you say that's one disadvantage of using computers.

Kenny: Yes.

Nombeko: Are there any other disadvantages that you can think of, of using computers? Other than plagiarism or sometimes not saving work?

Rob: Using them for the wrong purpose like pornography and like all that sort of thing.

Kenny: Like illegal loading of music.

Nombeko: If you don't have anything more to say then I'd like to thank you for your time.