COMPUTER LITERACY IN GRADE 9

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COMPUTER LITERACY IN GRADE NINE

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CHAPTER ONE

1.1. Background, motivation and outline of the study

The South African education system is undergoing radical transformation in terms of the curriculum. One of the means in the transformation process is the infusion of computer literacy in the schools' curriculum. The South African education system is being reshaped and this calls for co-ordination between the school and the workplace, as learners who are taught in schools are going to occupy different positions in different work situations. The school's task is therefore to equip learners with relevant computer literacy skills required in the workplace. The National Curriculum Statement (NCS) states: "Learners should understand the design process from conceptualisation to realisation. Problem-solving and lateral-thinking skills, creativity and innovation should be explored and developed through the systematic investigation of problems posed by a design brief in order to produce a marketable solution. Learners are given a brief, research the subject, generate ideas, develop concepts, implement, critically reflect on, and then evaluate the design solution. Self-discipline and responsible design ethics, as well as an awareness of aesthetics and functionality, must be evident throughout the design process," (Asmal, 2003, p. 3).

In countries like the United Kingdom, computer literacy is very important in that it is seen as a passport to employment (Bork, as cited by Moodley, 2002). The government of Rwanda's national goal on ICT is that Rwanda will achieve "middle-income status by 2020 based on an information-rich, knowledge-based society and economy" Farrel (2007, p. 3). Micheuz (2006, p. 1) states**:** "Schools in Austria providing compulsory education are accountable for imparting IT skills and informatics competencies to their pupils".

There is a shift in the South African education system to eradicate the imbalances of the apartheid education system. Curriculum 2005 has been put in place, however due to some uncertainties that academics have articulated about Curriculum 2005, it has been revised.

The principles of the NCS are the same as those of Curriculum 2005 in that they are based on building on the vision and values of the Constitution and Curriculum 2005 (Asmal, 2003, p. 2). The principles include social justice, a healthy environment, human rights and inclusivity (Asmal, 2003, p. 2). The NCS adopts an inclusive approach by specifying minimum requirements for learners. The special educational, emotional, social and physical needs of learners are addressed in the design and the development of appropriate learning programmes.

The transition from the apartheid education system to the present education system, i.e. the NCS, has not been without problems. Debates on educational issues are always arguable because they involve many other stakeholders such as politicians and the community (Asmal, 2003). In the past, South African education reflected the fragmented society in which it was based and hardly created conscientious, critical citizens. Education as a means of undemocratic social control created individuals who were not only short changed but were also compartmentalized along racial and cultural lines. The education system also failed to address the democratic principles based on access, full participation and equity (Asmal, 2003).

The objectives of the policy on E-education in the schools' white paper on E-education are that every South African learner both in General and Further Education and Training (GET and FET) will be information and communication technology-capable by 2013. Asmal went on to say that every school in General and Further Education and Training will turn into E-schools (Asmal, 2003, p. 4). The GET band here refers to Grades 7, 8 and 9 and the FET refers to Grades 10, 11, and 12.

With this as background, the researcher intended to understand whether or not the teaching and learning of computer literacy occurred in a constructive way, and one that will equip learners with relevant computer literacy skills required in the workplace; skills that will enable learners to solve economic, political and societal problems.

Meyer, Barber and Pfaffenberger (1999, p. 56) argue that: “Computers play key roles in our societies as they guide aircraft to safe landings, help surgeons perform tricky operations and route calls through a phone system”. The research took place in two high schools in rural areas in the Greytown area. The two high schools have computers and are teaching computer literacy starting from Grade 8 and continuing to Grade 12.

This study focused on Grade Nine as this grade is considered to be a preparatory stage when learners need to be shaped for the next grade (Grade 10) and begin to choose their career paths.

1.2. Rationale of the study

The research interest comes from the informal observation made when doing voluntary teaching in one of the local schools. The researcher observed that when it came to the teaching of computer literacy, educators focused on the theoretical part of it. Learners were not given a chance to explore on their own by getting hands-on experience with computers. Wissick (2001, p. 10) states that “too often computers are used as electronic worksheets for skills and practice without connecting to the real world”.

The South African Department of Education (DOE) and other non-governmental organisations (NGO s) are in the process of providing computers for schools that have basic infrastructure such as electricity. There are also exchanges and partnerships that are formed between South African schools and countries around the world such as the Maryland Computer Colleges, which impart computer technology to South African teachers (Roach, 2001).

Maryland entered into a “partnership with the South African college system to teach computer literacy among primary and secondary school teachers” (Roach, 2001, p. 5).

These partnerships are entered into as a means of assisting developing countries such as South Africa to improve the education system and, specifically, computer literacy among teachers and learners so that they can be part of the global village (Roach, 2001). Many other schools in South Africa are entering into partnerships with other countries to improve the teaching and learning of computer literacy in South African schools.

> *"In July 2006, TWB-SA presented its first computer lab to a rural school in South Africa. This was a collaborative, co-operative venture stretching from Hawaii across the world to South Africa, with various people in the Middle East working to make it all happen. Al Heiman at Cornell University spearheaded the collection of donated computers and tested and packed them for shipping to South Africa. From the first shipment, 25 machines went towards opening a lab at Mdlangaswa High School in Melville, KwaZulu-Natal, RSA. Ten more machines went to prison systems in Gauteng and KZN to help teenage inmates through high school while incarcerated. A few more PCs were delivered to rural private elementary schools so that student records could be compiled in an electronic database for the first time," (Peer, 2006-2007, p. 1).*

In April 2004, the Mpumalanga Department of Education, in partnership with Knowledge Network, implemented a pilot programme to equip educators and learners with the skills needed to use a computer as a tool.

Project managers and curriculum implementers from the Department of Education in Mpumalanga Province trained educators in new learning methodology and how to present information technology lessons to learners in their classes. The outcomes-based project and goal-oriented, active learning environment created for the learners required that the learners achieve the required outcomes at the end of each lesson, and complete an assessment. Educators, some with no prior exposure to computers, were required to mark the assessments and submit results in electronic form.

Dikotelo Combined School achieved a 100% pass rate for the participating Grade Nine classes. Mr B. S. Lekalakala, educator at Dikotelo Combined School, said that the educators responded positively and embraced the project (Peer, 2006-2007). “Their dedication, enthusiasm, and methods used under pressing conditions produced unbelievable and amazing results,” (Peer, 2006-2007, p. 10). Clearly, it is necessary that learners grasp computer literacy skills and are able to use them effectively in society. Sanger, Willson, Davies and Rogers (1997, p. 31) state that: “The ability to solve problems and communicate using a computer will be the fundamental facet of literacy for the next century.”

This study explores the teaching and learning of computer literacy in rural schools which were previously disadvantaged, and investigates approaches used in the teaching and learning of computer literacy to equip learners with relevant computer literacy skills required in the workplace. The research findings may help to inform:

- Computer/educational technology curriculum planners about the situation of the teaching and learning of computer literacy and what might be done.

- Teacher training institutions about the challenges educators encounter in the teaching and learning of computer literacy.

- Educational technology subject advisors about the situation relating to the teaching and learning of computer literacy in the two high schools.

- Educational technologists about the situation relating to the teaching and learning of computer literacy in the two high schools.

1.3. Statement of purpose

The purpose of the study is to explore the teaching and learning of computer literacy in Grade Nine: A case study of two high schools.

1.4. Critical questions

1. How do educators engage in the teaching and learning of computer literacy in Grade Nine?
2. What computer literacy knowledge and skills do Grade Nine learners acquire during computer literacy lessons?
3. What challenges do educators encounter during the teaching and learning of computer literacy in Grade Nine?

1.5. Limitations

The limitations for the researcher were gaining access to schools and establishing trust with the participants in order to get reliable information. To overcome this limitation the researcher established good relationships with the schools by hosting meetings with the educators and the principals of schools in order to explain briefly the purpose of the study.

The participant observation method used enabled the participants to be at ease because the researcher was fully involved in the teaching and learning process. Unavailability of funds unfortunately interrupted the time plan. To overcome this limitation, the study was started early in order to have enough time to seek financial assistance and to choose from alternatives while there was enough time to do so.

1.6. Methodology

Multiple methods were used in collecting data. These included semi-structured interviews, participant observation, questionnaires and telephone conversations. Participant observation was done over a period of two weeks.

Participant observation enabled full interaction with the participants and allowed a deeper understanding of the situation regarding the teaching and learning of computer literacy. Participant observation also allowed for in-depth information from the educators and learners on the teaching and learning of computer literacy.

1.7. Sampling

Expert sampling was used. Expert sampling is a type of purposive sampling used when one needs views of people with a specific knowledge in a field (Yeager, 1998).

1.8. Theoretical framework

The study is framed within the parameters of the constructivist theory and is located in cognitive flexibility theory, which is one of the theories under the constructivist paradigm. The principles of the cognitive flexibility theory are the design of learning environments, avoiding oversimplifying instructions, providing multiple presentations of content, emphasising case-based instruction, contextual dependent knowledge and knowledge construction and supporting complexity in a learning situation (Jacobson & Spiro, 1994).

If learners are to be computer literate, their computer literacy lessons could be framed within the above principles of the cognitive flexibility theory (Wilson, 1995).

1.9. The literature review

Chapter two of this research project entails the literature review. The literature review covers the conceptual framework, the uses of computers, different versions of what computer literacy is about and different studies that have been conducted on the teaching and learning of computer literacy.

1.10. Interpretation and discussion of research findings

Chapter four of this dissertation interprets and discusses the research findings from the three critical questions. Firstly, the research findings for the three critical questions are interpreted and then the research findings are discussed.

1.11. Conclusion

Chapter five of this dissertation outlines the recommendations. Data collected indicates that there are challenges that educators encounter in the teaching and learning of computer literacy, including insufficient time allocated to the teaching and learning of computer skills. It is in this chapter that the researcher draws conclusions on how the teaching and learning of computer literacy should take place.

CHAPTER TWO

2. Theoretical framework and literature review

2.1. Introduction

The study explored the teaching and learning of computer literacy. In this chapter, the researcher presents the theoretical framework of the study and the literature review. The study is framed within the principles of the cognitive flexibility theory, one of the theories, which fall under the constructivists approach. The principles are the design of learning environments, avoiding oversimplifying instruction, providing multiple presentations of content, emphasising case-based instruction, focusing on contextual dependent knowledge, knowledge construction and supporting complexity in a learning situation (Jacobson & Spiro, 1994).

This theory underpins the answers to critical questions because the principles of the theory provide a flexible method of teaching and learning computer literacy; for example, the principle of avoiding oversimplifying instructions. This means that when learners grasp different skills during computer literacy lessons the instructor should emphasise that the computer literacy skills they are learning will help them solve practical problems in future. If learners are to be computer literate, their computer literacy lessons could therefore be framed within the above principles of the cognitive flexibility theory (Wilson, 1995). The literature review covers the uses of computers, different versions of what computer literacy is all about, and different studies that have been conducted regarding the teaching and learning of computer literacy.

2.2. The theoretical framework

Wikipedia (2001, p. 3) states: “Constructivist theory takes the view that learning is constructed. New knowledge is built using what learners already understand”. This means learners’ prior knowledge influences what learners construct in the learning process. According to constructivist theory, learning is an active process in which learners are enhanced in a way that enables them to construct their new understanding (Oseberg, 1997). Williams (2000, p, 50) argues: “Constructivism holds that learners learn by constructing knowledge in certain ways”. Constructivist learning environments enable students to construct their own knowledge through participation and interaction with their environments (Von Scoff & Sherman, 2004).

Learning should take place in an environment that supports and challenges a learner (Wikipedia, 2001). Learners are unique and they individually construct knowledge, building on what they already know (Bencze, 2007). The constructivists further contend that learning activities should be constructed in a way that involves “hands-on project-based methods” (Kim, 2001, p. 3). Moreover, the constructivists are of the view that in the teaching and learning situation “instructors needs to provide learning situations that will allow learners to develop their own knowledge, meaning and the truth that will be useful later in life" (Wikipedia, 2001, p. 1). This study intended to find out about knowledge and skills that learners acquire during the teaching and learning of computer literacy.

Learners should get hands-on experience so that they will acquire computer literacy skills (Bencze, 2007). In the constructivist learning environment the instructor needs to “play the role of the facilitator who will help individual learners to arrive at their own understanding of the content by providing multiple presentations of content” (Wikipedia, 2001. p. 21). Instructors are also viewed as “task managers whose functions are to set tasks, provide guidance and feedback” (Wilson, 1996, p. 50). Challenges faced by educators during teaching and learning of computer literacy could be reduced when there is clear guidance on how the educators can teach computer literacy.

The study is framed within the parameters of the constructivist theory described, and it is located in the cognitive flexibility theory, which is a theory of learning that addresses “known patterns of learning failure” (Wilson, 1996, p. 42). The practical aspects of cognitive flexibility theory on teaching and learning are when the approaches recommended by cognitive flexibility theory are used; the learner develops the ability to transfer the information from one situation to another. “The cognitive complexity of a subject usually leads to learning failures. These failures are due to the over-simplification of the subject matter and the inability of the student to apply the newly-acquired knowledge to various situations, that is, failure to transfer” (Wilson, 1996, p. 42).

One research question here is: How do educators engage in the teaching of computer literacy in Grade Nine? This research question was posed to find out if the methods that are used in teaching computer literacy engage learners in learning different aspects of a computer and whether they show a link with various situations such as learning how to write a newspaper article and being able to publish the article. The remedy for these problems related to complexity and irregularity of content requires the “learning of processes that produce greater cognitive flexibility” (Boger-Mehall, 2004, p, 1).

Jacobson and Spiro (1994, p. 6) state: “Cognitive flexibility theory is a model for designing learning environments”. One of the research questions is: What challenges do educators encounter in the teaching and learning of computer literacy? With this research question in mind the researcher intends finding out if computer literacy lessons occur in a rich environment in terms of computers.

The intention of cognitive flexibility theorists is to facilitate the advanced acquisition of knowledge in order to serve as the basis for expertise in complex and ill-structured knowledge domains (Jacobson & Spiro, 1994). Cognitive flexibility theory focuses on designing suitable and relevant learning environments for effective learning to take place. Computer laboratories in schools should have enough computers.

During computer literacy lessons, learners do not have to share computers so each learner has to use one computer (Asmal, 2003). “In order to teach, teachers must themselves be flexible. The flexible teacher is one who understands and is able to identify his or her own teaching strategies while using this knowledge to motivate his or her students,” (Cartwright, 2008, p. 10). “Nowadays, it is widely accepted that learning is an individual construction process and exploration and discovery are as important as thoughtful instruction. Learning happens in a social environment, and acquired knowledge is closely related to this environment,” (Weigand, 2007, p. 8). A learning environment contains the learner, a space or setting where the learner interacts with tools and devices in creating, communicating, producing and publishing his or her work (Wilson, 1996). The researcher aspires to seeing that the teaching and learning of computer literacy be based on the principles of the cognitive flexibility theory. The schools should have a separate room that should be used as a computer laboratory (Petrino, 2001).

One other question that was posed to educators was: Does each learner sit in front of his or her computer during computer literacy lessons or do they share computers, and what impact does that have on your learners’ learning? This question was intended to find out whether individual learners were being given a chance to be hands-on with computers.

“There is the importance of effective computer room design. A delicate balance must be struck among the numerous elements that go into computer room design, including room location, physical layout, physical security, UPS systems, backup generators, power distribution, cooling and humidification systems, raised flooring, fire detection and suppression systems, access control and security, and monitoring systems for all of them,” (Petrino, 2001, p. 5). It is important that schools have computer laboratories with sufficient computers for effective teaching and learning of computer literacy.

The classroom may be built in the form of a strong room for safety reasons. The conditions in the computer laboratory should be favourable for teaching and learning of computer literacy to take place. The computer laboratory should be ventilated (Petrino, 2001).

Rules for working in the computer laboratory should be posted on the wall. These rules should be binding so that individual learners use computers responsibly (Starr, 2004). This ought to be done in order to eliminate the cost that could be involved in repairing computers. Rules for working in a computer room should be made to ensure that computer lessons are accurate and meaningful (Starr, 2004). Crossroads Christian School in California provided a useful model of computer rules. The list is as follows: “Come to class with clean hands; operate the equipment properly; make sure you listen to directions; push your chair in when you are done; use your inside voice; touch the keyboard lightly; eat and drink outside the computer lab; remember to take your printouts with you; learn something new each time you come to the computer laboratory; always work to your level best not to your neighbour’s best; and be careful when handling CD Rom” (Starr, 2004, p. 12).

This model can be used as an exemplar of designing rules for the computer laboratory. The educators in the computer laboratory should prioritise the rules for working there; rules should be binding for all users of the computer laboratory so that when learners interact with computers they do so responsibly and adhere to all rules of the computer laboratory. This should be done in order to avoid damage that can be caused by haphazard use of the computers (Corubin. Kelman, Roberts, Snyder, Watt & Wenner, 1989). Rules for working in the computer laboratory might help in contributing towards a learning environment which is conducive to the teaching and learning of computer literacy.

Conducive learning environments will enable computer literacy learners to enter self-contained micro world environments to learn (Gagne, 1991, p. 30). Wilson (1995) defines a learning environment as a place where learning is fostered and supported, unlike instructional environments where learning is controlled and dictated.

The learning environment should enable students to explore and to determine goals. Wilson (1995, p. 20) argues that: “Development of learning environments encourages self awareness and responsibility of learning and use of modern technologies to facilitate telecommunications.”

According to Barrett, learning environments for computer literacy should be rich in terms of hardware and software as well as information (2001, p, 56). Barret (2001, p. 60) also states that: “The Intel Pentium 4 processors and Microsoft Windows Vista bring unprecedented performance and capability in today’s home and business.” This idea does not deny the fact that there is other software that can also be used for the teaching and learning of computer literacy if available. Furthermore, learners should be engaged in solving complex problems and should always be encouraged to reflect on their work during computer literacy lessons so that they can improve on their computer usage (Jacobson & Spiro, 1994).

During the teaching of computer literacy, educators need to understand that there are various methods of presenting content and that individual learners are unique, they individually construct meaning (Jacobson & Spiro, 1994, p. 30) and relate to their experiences. Jacobson and Spiro (1994, p. 21) also believe in providing multiple presentations of content. Educators therefore need to present content using multiple methods in order to accommodate individual learners. In that way, individual learners might acquire relevant computer literacy skills that will enable them to function effectively in the workplace. If learners have acquired sufficient computer literacy skills, those skills might enable them to explore the complexities of the world.

The use of case studies in the teaching and learning of computer literacy might help broaden learners’ minds in the understanding of real-world problems that can be solved using computer literacy skills.

Cognitive flexibility theorists assume that the use of a variety of case-based instruction will enable learners to acquire a vast knowledge of the use of computers in a variety of contexts (Jacobson & Spiro, 1994). In the computer literacy lessons, learners need to develop self-directed learning skills. Cognitive flexibility theorists are of the idea that learners should be exposed to complex situations (Jacobson & Spiro, 1994).

When working with computers during computer literacy lessons learners should be channelled to give multiple presentations of the same information, for example, information can be presented in text format when using Microsoft Word, and it can also be presented using a graph using Microsoft PowerPoint. Furthermore, when learners are working with computers during computer literacy lessons they need to be encouraged to reflect on their experiences outside of school (Wissick, 2001). In this way, learners will be encouraged to acquire computer literacy skills that are required in society.

A framework for the teaching and learning of computer literacy suggests that when learners are engaged in computer literacy lessons they should be facilitated in such a way that they create, communicate, produce and publish using computers (Wissick, 2001).

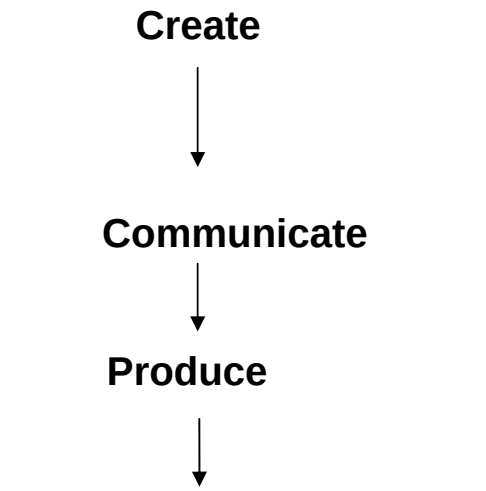

Figure 1.1: A framework for teaching and learning computer skills

When learners are engaged in the teaching and learning of computer literacy they could be facilitated in such a way that they create different forms of work using the available software. To mention a few: text documents, application forms, newspaper articles (using word features), creating calendars, programmes for different occasions, cards for different events using Microsoft Publisher, creating class lists, graphs to present text information using formulas provided by spreadsheets, creating presentations and using the internet (Sherman, 2001). Computer-literate people have the ability to create or use “simple documents, extra word features, spreadsheets, presentations and the Internet” (Sherman, 2001, p. 56). Adamu (2004) sees ICT as a set of technological tools and resources used to communicate and create, disseminate, store and manage information.

If learners are guided in creating different forms of work using a computer, they might be proud to communicate their individual work to their peers. When learners have communicated their work to their peers, their work can then be produced, ranging from academic work to non-academic work.

Academic work ranges from text documents to research findings. Learners' work might be published as journal articles and in textbooks. Non-academic work ranges from newspaper articles, creation of calendars and creation of cards for different occasions (Sherman, 2001).

Computer literacy skills, according to Wissick (2001, p. 8), can mean: "Learners engage in constructive activities such as word processing, reading electronic text, creating multimedia presentations, publishing and researching using the internet and developing spreadsheets and databases." Learners' work can, at a later stage, then be published as books, newsletters or it can be published on the internet (Wissick, 2001).

2.3. The literature review

Computers can process payroll information, mathematical formulas, compare statements, and help communicate with people in the rest of the world (Shelly, Cashman, Vermaat & Walker, 2001). The computer cannot decide for itself what to do with the information; users must make choices and direct the computer so that it performs the right functions. Educators need to teach computer literacy in such a way that will enable learners to give the right orders to the computers to avoid technical problems. Corubin, Kelman, Roberts, Snyder, Watt and Wenner (1989, p. 5) see a computer as a rich and complex tool that is increasingly within the financial means of a school to acquire.

2.3.1 The uses of computers

Bitter (1996, p. 60) contends that: "Because computers are such an important part of our lives we need to know a little bit about how they work and how to use them." Learners do not need to know a little about how computers work they need to know more about computer usage through effective computer literacy teaching and learning. Computer literacy educators have a challenge to help learners achieve this goal.

Findings of a study on introducing computer literacy in schools by Mdunge (2005, p. 95) indicated that, “All children are interested in computer literacy. Teachers employ various approaches to teach: teacher-centred, learner-centred and a participative approach. A video projector should be there in order to demonstrate the concept being studied. One of the research questions for this study is to find out the methods that educators use in the teaching and learning of computer literacy.

> *Alvarez (1995, p, 1) states: “As technology grows increasingly more advanced and develops into the leading source of world information transportation, it becomes necessary too for individuals to become familiar with these technologies and develop them for their own use. The age of computer literacy is upon us, with thousands of computers being bought each day and thousands more already in use, they are quickly becoming a mainstay in our lives. It is even more apparent in the economy where companies depend on machinery and equipment that are far more advanced than past equipment. Most companies that wish to succeed in this global economy have to become computer-literate in one way or another. Learners are members of the society who need to be equipped with computer literacy skills. This computer literacy entails not so much the intricate knowledge about how a computer works but rather just the ability to use it for work-related tasks. Whether the firm uses some type of machine that is controlled by a microprocessor or whether they directly use these computers, they do interact with these machines and must learn to use them. I will argue that computers, however small, have, and will to a greater extent, become a part of the fundamental knowledge needed to survive in society.”*

The above research provides evidence that computer literacy is indeed in demand. Learners need to be computer-literate in order to use computers successfully.

Bigelow (2009) states that there are four categories of people who use computers: computer users, a term which refers to people who use computers for word processing, spreadsheets, database managers, accounting programmes; computer programmers, who are people who do not only work with existing computer programmes but also install different programmes that run on computers; computer technicians who repair computers; and computer designers, who are people who design new computers and computer parts. Computer literacy skills that learners acquire at school may help them engage in different fields of computer technology at a later stage.

Learners could be given outcomes to be achieved at the beginning of computer literacy classes, and these should even specify behaviour of learners. Computer literacy can be made effective with the outcomes of computer literacy lessons together with rules for working in the computer laboratory (Starr, 2004).

Computers are able to process great quantities of information that human beings cannot manage, not only for educational purposes, but also in the field of work. The computer also makes it easy to access information via the World Wide Web. Each individual has to have an understanding of the use of computers in order to function effectively in today's world (Shelly, Cashman, Vermaat & Walker, 2001). Computer literate learners can therefore use computers for the different purposes mentioned above.

Computers are fast, reliable and accurate, they do not get bored and they can work for 24 hours processing information. Learners can view computers as mutual friends. Computer literacy is very important; a computer-literate person can perform a variety of tasks on a computer. The list of tasks is endless: "a computer literate person can navigate computer graphics, which are, for example, used in the medical fields for brain scans and biochemists use computers to examine molecular structure" (Reddy, 2004, p. 34).

Graphic designers produce almost all advertisements for magazines and television. Computers are also used in the commercial fields; bar codes on different products are the work of computers. Computers have produced paperless environments as offices are now using computerised bookkeeping, and documents sent via e-mail have meant reduced paper usage. In the banking field computers are used to make banking easier with the use of automated teller machines. Banks also use computers to store clients' information (Reddy, 2004).

In the government sector computers are widely used. People from the South African Revenue Services use computerised records for tax collection. Computers are also used in various other government sectors. The Education Department uses computers in their offices to store and process payroll information and for various other functions. In schools computers are used for computer-aided instruction and computer literacy (Reddy, 2004). Capron (1995, p. 45) states that "computers are also used in the news gathering process".

Learners are future labourers who will be operating in different workplaces. The skills that are needed in different workplaces include computer literacy skills; learners need to be thoroughly equipped with relevant computer literacy skills that will enable them to function effectively in the workplace. Computer literacy skills emerged from a nice-to-have skill to a job-critical skill (Long & Long, 1998).

2.3.2. Computer literacy

It is of great importance that everyone who engages in the teaching and learning of computer literacy gets a clear understanding of what computer literacy is, and formulates their own definitions of what computer literacy is. Here the researcher gives her own understanding of the term 'computer literacy' and other authors' inputs on what computer literacy is all about. Most dictionaries define the term 'computer literacy' simply as the ability to read and write.

McKay (2000, p, 5) states that: "Computer literacy is considered to be a very important skill to possess. Employers want their workers to have basic computer skills because companies are becoming ever more dependent on computers.

Many companies try to use computers to help run their companies faster and cheaper." Further argue that "Computer literacy does deal with how the computer works (digital circuits), but does imply knowledge of how the computer does its work (calculates, compares and copies)".

Norman (2006, p, 10) argues that: "Computer literacy is the ability to use computers to solve problems. Given the relative ubiquity of computers in our society, it is often assumed that people know how to use them. Yet, computer literacy is nearly impossible without quality access to computers and current information technology".

The term 'computer literacy' goes beyond reading and writing. Computer literacy started to emerge as a basic to education, but with the developments in the field of computer literacy that include multimedia, computer literacy is seen as providing a path to communication, learning, knowing, problem solving and many other functions that a computer can perform (Moursund,1991).

Computer literacy refers to "getting hands-on experience with computers and the acquisition of skills together with an understanding of the impact of the knowledge gained" (Kim, 2001, p. 3). Freire, Macedo and Giroux (1996, p. 86) contend that: "Computer literacy refers to the usage of computer technology to grapple with history and the present in interacting with others as a way of politically shaping the future".

(Eisel, 1996) defines computer literacy as the knowledge of computer theory, including some knowledge of how computer hardware makes it all possible and the constraints a computer can accomplish. Inskeep (1982, p. 7) views computer literacy as the "knowledge of history and the development of computers", while Ron Pet (1998, p. 12) believes that computer literacy and computer studies "comprise the development of problem-solving techniques". When learners engage in computer literacy lessons they can be exposed to various problems that can be solved using different computer programmes, and that includes Microsoft PowerPoint, Microsoft Excel and the Internet.

Tennenbaum and Rahn (1984, p. 23) argue that: “Computer literacy refers to an understanding of the social impact of computers.” This means that computers have both a positive and negative impact on society.

In the banking sector for example, criminals use computers to fraudulently draw money from people’s accounts using the Internet. A computer-literate person should have an understanding of all that so as to prevent it. Computer literacy is an understanding of what a computer is and how it can be used as a resource.

Computer literacy is seen as the knowledge of what a computer is and that includes computer jargon. Computer literacy is also about an awareness of the pros and cons of a computer (Adams, 1984). It is about the knowledge of what a computer is and how it operates. Interaction with the computer should make the user feel more comfortable and be able to appreciate the reality issues involved in computerisation including the pros and cons of a computer (Reddy, 2004). Adams (1984) contends that computer literacy consists of an understanding of the uses and pros and cons of a computer. Computer literacy also means developing skills to use computer applications such as communications, education, governance, consumerism, entertainment and employment (Capron, 1995).

Computer literacy can be defined as the awareness of the importance of computers, knowledge of how computers work, and interaction which refers to the ability to sit in front of a computer and to interact with the computer (Capron, 1995).

Haigh (1985, p. 1) defines computer literacy as the compendium of knowledge and skill which ordinary, educated people need to have about computers in order to function effectively at work and in their private lives.

This study is based on the view that computer literacy is the knowledge and the skill of using the computer effectively in dealing with societal, economic and political challenges. Learners should get hands-on experience with computers so that they will effectively acquire computer literacy skills and knowledge (Kim, 2001).

Sinclair (2003, p. 55) defines computer literacy as the “ability to use computers”. Howe (2003, p. 1) defines computer literacy in the educational perspective as the “Basic skill from the perspective of that skill being a necessary societal skill”. The researcher sought to find out about the teaching and learning of computer literacy from the education perspective.

2.3.3. Studies on computer literacy

(The Australian Computer Society, 2003) studied the situation of computers in Australian schools and came up with the following recommendations: ICT literacy must be seen as an essential life skill. Students that graduate from school without an adequate grasp of ICT are setting themselves up for a life with a limited ability to meet their fundamental need such as employment, quality health care and access to facilities of information. There should be the development of a national ICT literacy standard to develop a model that is applied to all learners including assessment of ICT literacy at all levels of schooling. All schools should be provided with adequate and up-to-date equipment and software and be provided with a high level of technical support to ensure access to high quality services. The outcomes of the study were that computer literacy is in demand worldwide and that it is a household name for almost all the countries of the world.

Teachers need greater professional support and professional development to transform their teaching methods, to give them confidence and help them focus on how ICT can have a positive effect on teaching, learning and development of students’ skills (The Australian Computer Society, 2003).

This study in KZN sought to understand the methods used in the teaching and learning of computer literacy and to see whether schools had enough computers to impart computer literacy knowledge and skills to learners.

Gilster (1998) conducted a study on computers in schools, and one of the research questions was: How do you teach children today to learn computers? A survey was conducted in order to answer this research question. The findings were that learners had access to computers once a week. The curriculum for teaching computer literacy was in place. The challenge was that educators were unable to teach learners. The recommendations made included the use of a learning management system, where learners' progress could be stored on a database accessible to teachers.

Another recommendation was that learner-teacher contact should be arranged so that teachers responded to learners' questions. Learners needed to have enough time during computer literacy lessons so that they could grasp computer literacy skills. This study found that learners were not given enough time during computer literacy lessons. This is the finding of this study.

Eisenberg and Johnson (1998, p. 30) contend that: "End results of computer literacy lessons is not knowing how to operate the computer, but to use technology as a tool for organisation, communication, research and problem solving." This study attempts to find out if computer literacy is taught and learned in a constructive way, and one that will enable learners to use computers effectively in various ways in society.

Jonassen (1991, p. 11-12) argues that: "Educators and psychologists have applied constructivism in the development of learning environments. Educators create real world environments that employ the context to which learning is relevant and focus on realistic approaches to solving real-world problems."

The teaching and learning of computer literacy should take place in computer rooms with enough computers (a ratio of 1:1, one learner per computer) so that all learners acquire hands-on experience and gain confidence in using computers (Asmal, 2003). According to Hirumi (2002, p. 39), “richer learning environments contain more instruction kits and phenomena and place more control of the learning environment in the hands of a learner”. The world has become an information society. It is a challenging period in which computer literacy is in demand (Long & Long, 1998). Heppell (1993b, p, 30) argues that: “The ability to solve problems and communicate using a computer will be a fundamental issue in the next century. The children are going to live for another 70 years in the next century and a significant part of their lives will be to do with technology. It is critically important that they have the understanding to be proactive in that world both in work and leisure.” The technology that Heppell spoke about includes computers.

We are already in the century proclaimed by Heppell. Heppell’s study was conducted in the United States of America and the findings were that learners were delighted to have computers in their classrooms. The above study advocates computer literacy so that learners can survive in the corporate world. Learners can be computer literate, if obstacles encountered during the teaching and learning are eliminated. Learners were interactive, co-operative and collaborative when working with computers (Heppell, 1993b). Heppell used interviewing and observation to get in-depth information. In this particular study interviewing and participant observation to get in-depth information on how educators teach computer literacy was used. The study also sought to find out what challenges educators encountered in the teaching and learning of computer literacy.

Brandjies (1999, p. 1) of School Net South Africa states that: “South Africa boasts over 700 schools online and 2500 schools with computers and can be considered as the leading country in Africa in terms of online connectivity in schools.” Brandjies (1999, p. 5), however, adds that you can easily put computers in schools but the question is how to use them.

This study intended taking this question further as it tried to find out if there was a framework that served as a guideline for how educators could teach computer literacy in the GET band, specifically in Grade Nine.

The researcher is quite aware of the ongoing studies that promote integration of computers in the teaching and learning of different subjects. Some of these studies reject the notion of teaching computer literacy in isolation; they promote the integration of computers in teaching different subjects. Wong (2005) conducted a study on teaching geography using a computer in what he referred to as learning about technology, not learning technology. In this study, 166 learners were given a task to submit a geography assignment online. Prior to submission of the geography assignment, the 166 learners were given computer literacy skills so that they could submit their assignments online. Computer literacy skills given to learners included usage of the Internet, search engines and the inclusion of key words.

Learners were also taught how to create presentations using Microsoft PowerPoint, how to include a table of contents, hyperlinks, navigation, reference list and to acknowledge sources of information. After learners were taught all these computer literacy skills they were then given an assignment to search for information on natural disasters on the Internet in order to assess them on the computer literacy skills they had acquired. Learners were to prepare their work using Microsoft PowerPoint. The findings indicated that learners were able to submit their assignments online. The findings of this research prove that learners do need computer literacy skills so that they can use computers effectively in other subjects that they are learning.

Learners need to be computer literate before they integrate computers into learning other subjects. This study is about computer literacy skills. Learners need to acquire and use computer skills in different aspects of their lives, including integration of computers into learning different subjects.

(Papastergiou, 2009) saw a need for integrating computers into teaching and learning physical education and sports science. The study aimed at designing a computer course to teach computer literacy skills to physical education students and sports science students so they could grasp computer literacy skills and successfully integrate those skills into learning. The study also looked at students' responses to the computer literacy course, the ability to use the Internet, students' attitudes towards a computer literacy course, and computer anxiety. The study was conducted using both qualitative and quantitative research methods since questionnaires and transcripts were used in an online discussion forum.

The findings of the research indicated that students were positive about the computers and internet usage which reduced cyber-phobia among students. The recommendations were that computers would be integrated into the teaching of physical education and sports science courses. The aim of the study, which was to design a computer literacy course to prepare physical education and sports science students for integrating computers into learning, is what this study aspires to do. Learners need to be acquainted with computer literacy skills before integrating computers into the teaching and learning of different subjects.

Rusten (2004) states that many schools teach learners about computers, which includes word processing, presentation and spreadsheets. Rusten recommends this approach to teaching and learning computer literacy if it is to be used to serve as a base that will acquaint learners with skills they require in order to integrate computers into learning different subjects. Learners do need to be acquainted with computer literacy skills so that they can effectively integrate computers into learning different subjects - as confirmed by Papastergiou (2009).

Herselman (2003) conducted a study to find the level of ICT implementation in rural schools in South Africa.

One of the findings (Herselman, 2003, p. 947 - 948) was that there was a lack of computers. It was found: “Computers and computer resources are indispensable in the education and the business environment today. It is very difficult for someone who is computer-illiterate to complete his or her tertiary studies or to find gainful employment. Most jobs in the business world require some computer and Internet skills”.The researcher conducted research to find out if the schools where the research was conducted had or did not have computers and to find out how the schools overcame the challenge of having too few computers.

The teaching of computer literacy should take place in a rich and conducive environment with a computer laboratory and sufficient computers (Asmal, 2003). Herselman (2003, p. 948) further argues: “Lack of technical training is one of the factors that lead to ineffective implementation of information and communication technology (ICT) in rural schools”.

Many schools in rural areas lack teachers with appropriate computer literacy skills and Internet usage; this results in most rural schools not being able to offer computer courses, and learners not being adequately prepared for tertiary studies where computer and internet knowledge are indispensable. This creates a gap between rural schools and their urban counterparts”. Learners, and mainly those in rural areas, are deprived of the opportunity to acquire computer literacy skills.

This is going to widen the gap between technological haves and have-nots. In this way, South Africa will have people that are under-developed in terms of computer literacy skills. Hana (2007, p. 8) states that: "Teachers are agents of change and in order to effect change in the classroom we need to ensure that teachers are competent when it comes to using the tools of the information age”. These are the objectives of the Internet Service Providers Association of South Africa when they provided computer literacy training for South African teachers.

Ediger (1994, p. 1) contends that: “The design of the curriculum needs careful consideration so that each individual pupil may attain as optimally as possible. Learners must experience interest in meaning and purpose in the teaching and leaning situation. Quality design in the curriculum may well guide individuals to individually attain as much as possible.” There needs to be a curriculum for teaching computer literacy, and when designing the curriculum, learners’ needs and abilities need to be put forward. There also needs to be emphasis on the fact that learners are unique in terms of their abilities and requirements. This study by Ediger was conducted in the USA, but its contents apply to every teaching and learning situation. The researcher intended to find out about the process used in planning lessons and if it helped learners to create meaning out of what they were learning.

Corbit and Terry (1994, p. 133) claim that: “Microcomputers have high motivational value and are regarded by students as exciting deliverers which they are eager to use. Such motivation is very important; studies have indicated that the amount of time spent studying a subject is directly related to knowledge gained, therefore, any factors that increase motivation should be encouraged. Nowadays computer literacy has become popular in education, business, community, schools, communications, governance, entertainment and consumerism and as a result, individuals are eager to be computer literate”. Learners as members of society are among those who are eager to be computer literate. This study intended to find out if the methods that educators use in the teaching and learning of computer literacy equip learners with computer literacy skills.

Greenwood (1993, p. 60) contends: “Another very emotive subject with teachers, pupils and computer-literate parents is that of the depth or a lack of computer knowledge in school”. This study was intended to bridge the gap between the lack of computer literacy in schools for that is needed in workplaces; it also sought to find out the methods used in the teaching and learning of computer literacy.

Computers play an enormous role in our lives, and they make work easier in most aspects of our lives. (Meyer, 2004) believes that people who lack computer literacy skills will never be able to compete for the best jobs. This indicates that experts worry about the gap between haves and have-nots. Educators need to ensure that learners are not left out technologically speaking.

In an article by Ngcangisa (2007), he reported a story of a girl by the name of Thembi who was passionate about educational technology in that she made a sacrifice and had to overcome obstacles in order to impart computer literacy skills to learners in her area. Thembi went out of her way as she was originally trained as an executive secretary with information technology modules. The school governing body and parents were not in favour of the idea that Thembi wanted to impart computer literacy skills to learners but she was able to find a way to convince both parents and the school governing body to allow her to do this using the school's buildings. Thembi did not stop there. She went on to purchase computer parts with money from her own pocket and she is now proud that learners in her area (Kwaggafontein, Mpumalanga Province) are being equipped with computer literacy skills.

This is what Thembi had to say about the youth of her area: "They were fascinated when they saw the magic of the computer," (Ngcangisa, 2007, p. 16-17). Educational technologists like Thembi should take the initiative to ensure that learners are equipped with computer literacy skills that will enable them to operate in the workplace so that they will be able to function in the modern world (Shelly, Cashman, Vermaat & Walker, 2001).

Southwood (2001, p. 10) argues that more than 60% of current job opportunities require computer literacy at entry levels. This is in South Africa, where computer literacy is obviously in demand. The methods that are used in the teaching and learning of computer literacy should actually equip learners with relevant computer literacy skills that will enable learners to operate in the workplace.

A study conducted on the needs of African people revealed they need computers, water and clothes and other necessities of life. African people have a great desire to learn and to utilise the tools of modern technology (Wosiyo, 2001, p. 10). With the desire that African people have to utilise the tools of modern technology, this study sought to find out the methods used in the teaching and learning of computer literacy and if the methods equipped learners with computer literacy skills.

According to the constructivist theorists, learning is an active process where learners are enhanced in a way to construct their new understanding (Oseberg, 1997). Constructivist learning environments enable learners to construct their knowledge through participation and interaction with their environment (Von Schoff & Sherman, 2004).

The aims of this study are to highlight the point that the teaching and learning of computer literacy should enable learners to construct knowledge and acquire skills in an active learning environment. Learners should be given an opportunity to get hands-on experience with computers. The constructivist is of the belief that reality is socially constructed through our interpretations of experience.

Computer literacy lessons should enable individual learners to construct reality of the world they live in. Ismat (1998, p. 10) contends that: “Social Vygotskian constructivists emphasise education for social transformation and this reflects a theory of human development that situates the individual within a socio-cultural context”. Computer literacy skills and knowledge should enable individual learners to transform society in various ways.

Efiong (2001, p. 35) argues that: “Children all over the world have their own individual variations in the models of thinking and remembering and they have distinctive ways of taking in, storing, transforming and utilising information and solving problems.” The effective teaching and learning of computer literacy enables learners to explore all these tasks.

Windschlt (2002, p. 2) states that: “The most profound challenge for teachers are not merely associated with acquiring new skills but with making personal sense of the constructivism as the basis of instruction regarding orientating the cultures of the classroom to be consonant with the constructivist philosophy”. Gordon and Cole (1994, p. 84) argue that to develop valued models of teacher development one needs to listen closely to the teacher’s voice. We need to continue almost obsessively with that act of listening. Semi-structured interviews enabled the researcher to listen closely to the educator’s voice about the teaching and learning of computer literacy. Mayer (2003, p. 7) states that “learning is more meaningful when learners construct their own knowledge”. Educators play a role of being facilitators in the learning process and educators need to accommodate learner’s knowledge in the teaching and leaning process (Hoover, 2003).

(Simons, 2005) provides guidelines for what can be done if the school has insufficient computers. A computer literacy educator can establish a scheduled time for pairs of learners to use computers and to encourage peer tutoring.

Presentit (2009, p. 1) provides a model of lesson planning for computer literacy learning for Grade Nine. The teacher’s preparation may include: “a teacher’s guide with background information, lesson plans and answers, assessment sheets, a CD (compact disc) with presentations to be used during the lessons, practice files and more information, ready-to-copy worksheets, license to make copies of the worksheets for the learners and the school visual display on CD. The suggestions for what learners can learn in Grade Nine are website design and work with operating systems, including file naming, desktop settings and file management, spreadsheets and how to work with peripherals, including printers, scanners, cameras, infrared and Bluetooth. This is a very useful model for learning computer literacy. Schools have to ensure that they develop a society that is free of cyber-phobia (the fear of computers). Computer competency is a sure cure for this”.

“Computer competency will allow one to be active and effective participants in the emerging information society,” (Long & Long, 1998, p. 36-37). A computer brings people together and that is why people are now talking about a global village where computers are linked within companies, i.e. computer networks (Long & Long, 1998).

2.4. Conclusion

When conducting this literature review the researcher found limitations in the literature on the teaching and learning of computer literacy. The literature that the researcher mainly came across was based on the use of computers in education and the integration of computers into education. For learners and educators to be able to integrate/use computers in education, they need to be computer literate first. Valenza (1998, p. 36) argues that: “Learners should have computer literacy [knowledge and skills] before taking part in courses that integrate advanced computing methods”.

CHAPTER THREE

3.1. Methodology

Principles of the interpretive approach were used in collecting data. The interpretive approach is concerned with interacting with the subjects in their natural world and about understanding the phenomena being studied and interpreted (Terre Blanche & Kelly, 1999). The research was carried out using qualitative research methods. Marshall and Rossman (1999, p. 3) contend that "qualitative research takes place in the natural world with the use of multiple methods that are interactive and humanistic, and that qualitative research is fundamentally interpretive". For this study, data was collected using semi-structured interviews and participant observation, which enabled the researcher to interact with the subjects in their natural setting.

In the interpretive approach, the researcher is the primary instrument for both collecting and analysing data. Qualitative researchers, according to Terre Blanche and Kelly (1999, p. 126 – 127), need to listen, question and interpret, therefore they are also instruments for collecting data. Greene (1999, p. 385) states that: "Methodologically the interpretive approach is most consonant with natural settings with the human enquirer as the primary gather and interpreter of meaning using qualitative methods". Interpretive researchers seek to "understand reality from a subjects' or insiders' perspective and context" (Gephart, 1999, p. 6).

> *Terre Blanche and Kelly (1999, p. 123 – 125) argue that: "Interpretive researchers try to describe and interpret people's feelings and experiences in human terms rather than through quantification and measurement. People's subjective experiences are real and should be taken seriously. Researchers understand others' experiences through interacting with them and listening to what they tell them. Qualitative research techniques are best suited for this task. In the interpretive approach the researcher uses first-hand accounts, tries to describe what is what in detail and present findings in engaging and sometimes evocative language.*

> *In conducting research the researcher interacts with subjects to get understanding of their situations and at a later stage to interpret their voices to give understanding of the meaning that the participants gave."*

Rabinow and Sullivan (1979, p. 11) state that one "must understand the world in order to interpret it". Greene (1999, p. 387) contends that understanding meaning as the goal of interpretive inquiry is a question of openness and dialogue. When one is reading a research report Terre Blanche and Kelly (1999, p. 125) state that: "It is not necessary to understand the author's specific intentions, but to also include in the operation of 'verstehem' (understanding) a knowledge of the socio-historical and linguistic context in which the author worked".

Burrel and Morgan (1979, p. 28) state that: "The interpretive paradigm is informed by a concern to understand the world as it is, to understand the nature of the social world at the level of subjective experience. The interpretive paradigm seeks explanation within the realm of individual consciousness and subjectivity within the frame or reference of the participants as opposed to the observer action".

Qualitative researchers, according to Denzin and Lincoln (1998, p. 372), believe reality is socially constructed through interaction with the subjects being studied. "Subjects of the study are complex and hard to measure. Qualitative research methods allow one to get a broader understanding of the subjects being studied". Rossman and Rallis (1998, p. 9) contend that qualitative research "takes place in the natural world with the use of multiple methods that are interactive and humanistic in nature".

3.2. Data collection instruments

Qualitative research is fundamentally interpretive. In collecting data for this study multiple methods were used to triangulate (Terre Blanche & Kelly, 1999).

Semi-structured interviews, participant observation, telephone conversations and questionnaires were used. Participant observation was done for a period of two weeks. It helped the researcher to get enough time to interact with the educators and learners and to get a deeper understanding of the situation regarding the teaching and learning of computer literacy.

Semi-structured interviews allowed for in-depth information from educators concerning the teaching and learning of computer literacy. Semi-structured interviews are interviews where the researcher prepares a guide that consists of a set of questions. The guide allows the researcher to probe for clarity and to get in-depth information (Flick, 1998). Participant observation is the data collection method in which a researcher becomes fully involved in the setting being studied (Terre Blanche & Kelly, 1999). Participant observation was used to collect data from both learners and educators as it allowed the researcher to interact with teachers and learners in the classroom in order to verify the information obtained from interviews.

Hoepfl (1997, p. 31) argues that in qualitative research the “researcher acts as a human instrument for data collection”. Participant observation enabled the researcher to act as a human observer for collecting data during the teaching and learning of computer literacy in the two high schools where the research was conducted. Participant observation also enabled the researcher to triangulate. Triangulation is the use of different methodologies for studying one phenomenon. Participant observation allowed the researcher to be in the learning environment and to see whether the learning environment was conducive to the teaching and leaning of computer literacy. According to Lincoln and Guba, with semi-structured interviews one can “probe to get in-depth information” (1995, p. 20).

Quantitative research methods were also used to collect data from learners. Questionnaires were administered to learners. These questionnaires helped in collecting data from a large number of learners (68 learners). Terre Blanche and Kelly (1999, p. 293) define a questionnaire as a “group of written questions used to gather information from respondents”.

Qualitative and quantitative research methods can be used simultaneously for studying one phenomenon (Rossman & Wilson, 1985). Questionnaires were administered to Grade Nine learners; the questionnaires enabled learners to communicate the experiences and skills they had acquired in the computer literacy classes. Questionnaires are defined by Hathaway (2000, p. 1) as “straightforward written questions requiring an answer by ticking the appropriate box and are very efficient ways of collecting facts”. The questionnaires used were useful in that all the questions designed to measure computer literacy skills acquired by Grade Nine learners were answered fully by learners. Questionnaires were valid in that data collected is in line with all the findings of this research.

Photo-voice was used when analysing data. Participants were asked to give permission for their photographs to be used in the study and they agreed. “Photo-voice is used to promote critical dialogue and knowledge about personal and community issues through large and small group photographs,” (CI Partners, 2009, p, 5).

The study is descriptive in nature, and a case study approach was used. Lindegger (1999, p. 255) defines case studies as intensive “investigations of particular individuals”. The research was conducted using individual educators and learners in the two selected schools in order to understand their experiences through interacting with them and listening to what they said. The American Heritage Dictionary (2000, P. 4) defines a case study as: “A detailed intensive study unit, such as a corporation or a corporate division that stresses factors contributing to its success and failure”. The study aimed at finding out what challenges educators encountered in the teaching and learning of computer literacy.

Case studies are qualitative research methods that seek to examine real-life situations (Soy, 1997). The focus of the study was on two high schools where computer literacy is taught and learned. The research focus was only on computer literacy educators and learners.

Strauss and Corbin (1990, p. 5) claim that “qualitative research can be used to better understand the phenomena about which little is known yet”. In South Africa, little has been done about the teaching of computer literacy, and this study hopes to break the silence regarding the teaching and learning of computer literacy.

The integration of computers into different learning areas by computer illiterate learners might lead to serious damage to computers resulting in high expenditure for maintenance and repairs of computers. Given that almost all rural schools are disadvantaged they are unlike the former Model C schools which have had computers for years. Damage to a few computers might deprive rural learners of the opportunity to be computer-literate.

Outlining the objectives of the white paper on E-education (electronic education) Cassaburi (2003, p. 1) states: “Every South African learner in General and Further Education and Training will be ICT- capable by 2010”.The researcher sought if these objectives are going to be attained.

Lincoln and Guba (1995, p. 20) argue that: “If you want people to understand better than they otherwise might, provide them with information in the form in which they usually experience it”. Qualitative research methods were used to get in-depth information and to analyse data qualitatively rather than just quantifying information.

Hoepfl (1997, p. 10) argues that qualitative researchers use the “natural setting as the source of data”. In conducting this study the researcher intended to observe, describe and interpret settings as they are without any interference. This is what Patton (1990, p. 55) calls “emphatic neutrality”.

Data was analysed using guided analysis, which enabled the researcher to deviate from the theoretical framework.

3.3. Sampling

Expert sampling was used. Expert sampling is a type of purposive sampling that is used when one needs views of people with specific knowledge in a field (Yeager, 1998). Patton (1990, p. 8) states, that in purposive sampling, subjects are selected because of some characteristics. Two Grade Nine computer literacy educators were selected to be the participants in the study because they were teaching computer literacy. The focus of the study was on Grade Nine learners in each of the schools where educators were participants in the study.

Expert sampling is further defined as a sampling method that involves the assembling of a sample of persons with known or demonstrable experience and expertise in some area. Often, we convene such a sample under the auspices of a panel of experts (Trochim, 2004, p, 12).

This study was intended to find out about the teaching of computer literacy from subject specialists (computer literacy educators).

3.4. Critical question one

How do educators engage in the teaching and learning of computer literacy in Grade Nine?

Semi-structured interviews and participant observation were used to collect data for critical questions. Semi-structured interviews enabled the researcher to probe, to get in-depth information, and to interact with the educators at school, which is their natural setting for teaching computer literacy.

The use of semi-structured interviews and participant observation enabled the researcher to observe, describe and interpret the learning environment and the teaching and learning of computer literacy. Two Grade Nine computer literacy educators were interviewed in each of the two high schools, in order to understand the methods they used in the teaching and learning of computer literacy and if those methods benefitted learners. Educators were interviewed once. After interviews were conducted with educators a discrepancy occurred when the researcher found out that educators used no framework in the teaching and learning of computer literacy.

A telephone conversation with a KwaZulu-Natal Department of Education official in the curriculum division at the head office was used to triangulate. The conversation was about what policy framework was used for the curriculum and the assessment guidelines they had in place for the teaching and learning of computer literacy in Grade Nine for Curriculum 2005 and for the National Curriculum Statement that was going to be implemented in Grade Nine in 2008.

The response was that there was no framework and assessment guideline in place for the GET phase, previously referred to as the senior phase (that includes Grades 7, 8 and 9). The official indicated that the educators could make use of the guidelines provided in the National Curriculum Statement for computer-aided instruction for the Further Education and Training phase.

This is in contrast to the recommendations that the educator union submitted in addition to the recommendations by the Curriculum 2005 Review Committee. SAOU's (Suid-Afrikaanse Onderwysersunie) findings were that the Curriculum 2005 Review Committee (2000, p. 5) noted that: "Learners completing Grade Nine are not empowered to make informed decisions about further learning (FET) or the world of work. The union also pointed to a lack of mention of computer literacy in the GET phase (senior phase) which it views as a necessity in a highly-technologically-orientated 21st century." SAOU is a teacher union and is the educator's voice. Their recommendations should have been taken into consideration when planning the curriculum because they were basically sound.

Participant observations were done in the computer laboratories when Grade Nine learners were having computer literacy lessons. Participant observation allowed the researcher to triangulate. Participant observation and semi-structured interviews were carried out in order to find out if the teaching and learning of computer literacy was in line with the principles of the cognitive flexibility theory.

3.5. Critical question two

What computer literacy knowledge and skills do Grade Nine learners acquire during computer literacy lessons?

Questionnaires were used to collect data for this critical question. Questionnaires were administered to Grade Nine learners whose educators were interviewed. Questionnaires were used to collect data from a large number of people.

Sixty-eight questionnaires were administered in order to understand whether learners had acquired some computer literacy skills during the teaching and learning of computer literacy.

3.6. Critical question three

What challenges do educators encounter during the teaching and learning of computer literacy in Grade Nine?

Semi-structured interviews were used to collect data for this critical question, and allowed the researcher to probe.

3.7. Gaining access

The research was conducted at two state high schools in Greytown. Rural schools have been previously disadvantaged in terms of information and communication technology. Now that rural schools are gradually being introduced to information technology tools that include computers, this will help in the effective usage of computers.

Two Grade Nine computer literacy classes were subjects of the study, there being one computer literacy class per school. A total of 68 Grade Nine computer literacy learners were observed and given questionnaires in which they were asked about computer literacy skills they had acquired during computer literacy lessons.

Schools are government institutions. The university's research unit made it easier for research by writing letters and forwarding them to the KwaZulu-Natal Department of Education, explaining the purpose of the study and its usefulness, and asking for permission to conduct research in schools. Letters were forwarded to the school principals of the schools concerned in order to gain access to conduct research.

Letters were also forwarded to the participants and these included Grade Nine educators teaching computer literacy, Grade Nine computer literacy learners and parents of learners who were doing computer literacy in Grade Nine. Letters to parents were written in English and translated into IsiZulu as some of the parents might not be able to understand English. Letters to the school principals, participants and parents of learners are in the appendices list at the back of this research report from (i – xix).

3.8. Limitations

The limitations involved gaining access to schools and establishing trust with the participants in order to get reliable information. To overcome this limitation the researcher established a good relationship with the schools by hosting meetings with the educators and the principals of schools in order to explain briefly the purpose of the study.

The participant observation method was used to enable the participants to be at ease and so that the researcher was fully involved in the teaching and learning process.

Lack of funds interfered with the time plan, and to overcome this limitation the researcher started the research process early in order to have enough time to seek financial assistance and to choose from alternatives while there was enough time.

3.9. Conclusion

The research tools used to collect data for this research project enabled the researcher to collect enough data to answer critical questions.

CHAPTER FOUR

4. Interpretation and discussion of research findings

The study was intended to be carried out at three high schools but one of the schools withdrew from the study as they had stopped offering computer literacy due to the post provisional norms.

This chapter presents the interpretation of data for critical question one, two and three; thereafter follows the discussion of the findings for the three critical questions.

4.1. Critical question one

How do educators and learners engage in the teaching and learning of computer literacy?

The following were the questions that were posed to the educators and the responses that they gave:

4.1.1. How long have you been a computer literacy educator in Grade Nine, and what are some of your experiences?

In School A the educator started teaching computer classes in Grade Nine in January 2007. The educator indicated that she had had a bad experience in the teaching and learning of computer literacy and that she could not cope because there were a large number of Grade Nine learners who were doing computer literacy, yet there were insufficient computers. It was difficult to discipline learners. The educator indicated that she was not an educator by profession but was, in fact, the school's administration clerk. She had to teach computer literacy as asked by the school principal because she had computer literacy skills.

In School B the educator started teaching computer literacy in 2005, and 2007 was his third year teaching computer literacy in Grade Nine. The educator indicated that he had experienced problems because there were a large number of Grade Nine computer literacy learners, only a few computers and very limited time to teach computer literacy as it was allocated one period of 50 minutes per week.

In this very limited time 38 Grade Nine learners in School B had to get hands-on experience using only 15 computers, and as a result, learners did not get enough opportunity to hone their computer skills.

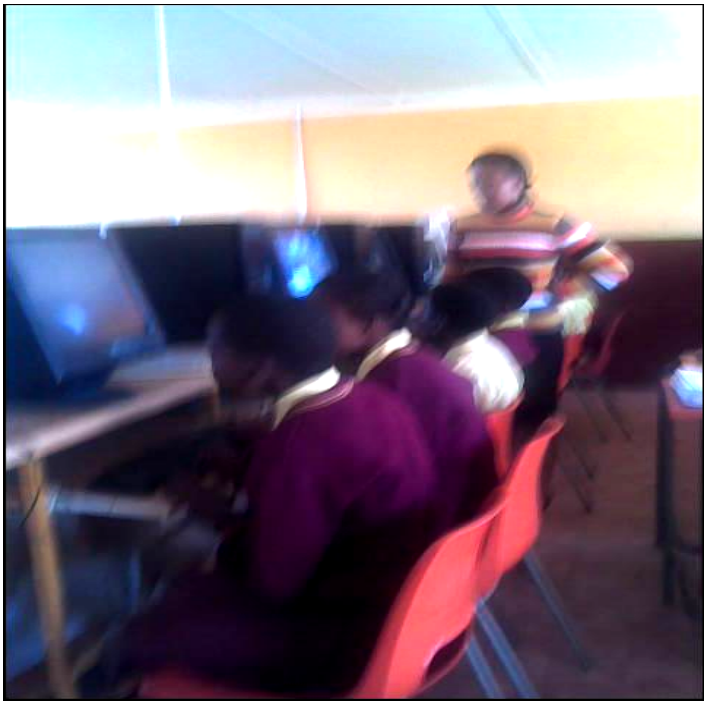

Figure 4.1: The educator using the demonstration method.

All the photographs that are used are faded for ethical reasons. When educators were asked how they taught computer literacy in Grade Nine, the educator in School A used the telling and the demonstration methods (showing learners what to do on the computer). Figure 2 indicates the demonstration method that the educator in School A used.

The educator in School B responded by saying: “I instruct learners on how to perform different functions on the computer.” The educator in School B also used case studies that allowed learners to perform a variety of functions on a computer.

4.1.2. How they assessed their learners?

The educator in School A did not appear to keep records of assessment or assess learners formally on their progress because computer literacy was a non-examinable learning area in the school. Computer literacy was not even included in the school’s curriculum. In School B the educator responded by saying: “After I am certain that learners are familiar with a certain application they have dealt with, I give them an assessment task to determine their progress even though computer literacy is not included in the school’s curriculum.”

The other question that was posed was:

4.1.3. What informs your teaching and learning of computer literacy? Are there any guidelines that you follow? How are those guidelines being followed?

In school A the educator indicted she didn’t use any guidelines and said: “I just teach the aspects of computer literacy that I feel are necessary.” Computer literacy was a non-examinable subject in their school. The educator in School B did know that there were guidelines provided by the National Curriculum Statement, his teaching of computer literacy was not informed by these guidelines.

The next question was:

4.1.4. Who designed your school's computer literacy curriculum?

In School A there was no Grade Nine computer literacy curriculum, as mentioned earlier on, so the educator just taught whatever aspects of computer literacy she felt were necessary and did not worry about the outcomes. In School B there was also no computer literacy curriculum available.

Another question that was posed was:

4.1.5. With what computer literacy skills have you acquainted learners?

In School A the educator indicated that she had acquainted learners with Microsoft Word and Microsoft Excel skills. The educator in School B had also acquainted learners with Microsoft Word and Microsoft Excel skills, and he was currently planning to equip learners with Microsoft Power Point.

The next question was:

4.1.6. Does your teaching of computer literacy inspire learners to create, communicate, produce and publish using computers?

In School A the educator did lead her learners to try create different versions of work, and learners did communicate their work as they were allowed to view each others work. In School B the educator also inspired learners to create their own work as he indicated that he formulated assessment tasks to assess his learners during computer literacy lessons. Assessment tasks that were given to learners included tasks that learners performed on the computer and printed out.

Participant observation was done to collect data for critical question one. Participant observation was also done to verify what transpired after interviews with educators. The researcher engaged in participant observation for two and a half hours in each school.

Participant observation was done to find out if the principles of the cognitive flexibility theory were adhered to during the teaching and learning of computer literacy. In School A, learners were facilitated in such a way that they created different versions of work that included Microsoft Word documents and the creation of class lists using Microsoft Excel. The educator also gave learners different tasks such as creating newspaper articles and inserting and writing information on tables using Microsoft Word. Participant observation enabled the researcher to witness the fact that educators used very limited methods in both schools.

4.2. Critical question two

What computer literacy knowledge and skills have learners acquired during the teaching and learning of computer literacy?

The following are Grade Nine learners' responses to questions asked in a questionnaire.

4.2.1. How do you feel when it is time to go for computer literacy lessons?

Learners' responses to question 4.2.1: Learners in both School A and B were eager to engage in computer literacy lessons; 100% of learners were eager to go for computer literacy lessons. This means that all 68 learners in School A and B liked to engage in computer literacy lessons. This suggests that all learners like engaging in computer literacy lessons. As quoted previously, Wosiyo (2001, p. 10) contends that: "African people need computers, clothes, food and other necessities. African people have a great desire to learn and to utilise the tools of modern technology."

4.2.2. How many computer literacy periods do you have per week?

In School A, learners indicated that they had one computer literacy period per week, the duration of which was 50 minutes. In School B they also had one computer literacy period of 50 minutes.

4.2.3. Do you think that the time you spend during computer literacy lessons is sufficient for you to acquire computer literacy skills?

Learners both in schools felt that the time they spent during computer literacy lessons was insufficient. Corbit (1994, p. 133) claims that microcomputers have high motivational value and are regarded by students as exciting deliverers which they are eager to use.

Such motivation is very important; as studies have indicated, the amount of time spent studying a subject is directly related to knowledge gained. This means that these learners do not acquire enough computer literacy skills because time allocated is insufficient.

The following question was posed to learners, based on the skills that they had acquired during the teaching and learning of computer literacy:

4.3.4. How do you rate your abilities regarding computer programmes (Microsoft Office) and their functions?

In both School A and B, 90% of learners were familiar with computer programmes, *and* only 10% of learners had a fair knowledge of computer parts. This indicates that a large number of learners were familiar with computer programmes but only a few learners were familiar with computer parts. McKay (2000, p. 4) states that: “Computer literacy does not deal with how the computer works (digital circuits), but does imply knowledge of how the computer does its work (calculates, compares and copies). It requires a conceptual understanding of systems analysis and design, application programming, systems programming and datacenter operations. It also implies hands-on ability to work the operating system (Windows, Mac, and Linux) and common applications such as spreadsheets, word processors, database programmes, personal information managers (PIMs), e-mail programmes and Web browsers.”

In both School A and B a large number of learners were familiar with computer programmes.

The following questions were posed to learners to find out about their abilities relating to word processing:

4.2.5. How do you rate your abilities regarding creating, saving, and printing word documents?

Seventy percent of learners rated themselves as very good at creating, saving and printing word documents and 30% rated their abilities as good at creating, saving and printing documents. This was the case for both School A and B. This response is in line with the responses from the interviews and what was observed during participant observation. Not all learners were facilitated in such a way that they could create a variety of tasks using a computer; this is in contrast to what is stated in the National Curriculum for the subject Computer Aided Technology (CAT) which is that the ratio should be 1:1 (one learner per computer).This is not adequate because all learners should be familiar with Microsoft Word features (Asmal, 2003).

4.2.6. How do you rate your abilities regarding inserting tables and drawing lines?

Thirty-five percent of learners regarded themselves as being very good at inserting tables or drawing lines using a computer; 20% of learners as good; 27% had little ability on working with tables and drawing lines and 18 % of learners were unable to insert tables and draw lines. Computer literacy skills, according to Wissick (2001, p. 8), can equip learners to “engage in constructive activities such as word processing, reading electronic text, creating multimedia presentations, publishing, researching using the internet and developing spreadsheets and databases.” All learners should therefore be acquainted with all computer literacy skills.

4.2.7. How do you rate your abilities in deleting and inserting pictures?

There were no learners that were very good at editing, deleting and inserting pictures; 72% of learners were good at editing, deleting and inserting pictures; 17% of learners had bare minimum abilities regarding editing, deleting and inserting pictures and 11% of learners were unable to edit, delete and to insert pictures. Ediger (1994, p. 1) contends that: “The design of the curriculum needs careful consideration so that each individual pupil may attain as optimally as possible.” This implies that learners were not being taught to attain optimum computer literacy skills.

4.2.8. How do you rate your abilities in underlining, bold, centre align, align right and left and justify?

Sixty-eight percent of learners indicated that they were very good at underlining, bold, centre, right and left aligning and justifying; 4% of learners were good at underlining, bold, centre and right and left aligning and 28% of learners had bare minimum abilities. This means that the time spent during computer literacy lessons was insufficient, and learners were unable to acquire all computer literacy skills.

4.2.9. How do you rate your abilities regarding margins, page setup and paragraphs?

None of the learners had very good or good skills regarding margins, page setup, and paragraphs; 41% of learners had bare minimum abilities regarding margins, page setup and paragraphs and 59% of learners did not have any abilities regarding margins, page setup and paragraphs. Learners were therefore unable to work competently with margins, page setup and paragraphs.

4.2.10. How do you rate your abilities regarding the spell check?

Learners were not very good regarding the spell check in that only 15 % of learners were good at using it; 35 % of learners had a little basic ability regarding the spell check and 50% had no abilities regarding the spell check. Computer literacy can be defined as awareness of the importance of computers, knowledge of how computers work and interaction referring to the ability to sit in front of a computer and to interact with the computer (Capron, 1995). Learners will not be able to sit in front of the computer and interact with the computer in a useful way if they do not have all the abilities required for working at a computer.

The following are questions that were asked based on the learners' abilities on creating a spreadsheet:

4.2.11. How do you rate your abilities regarding creating, saving, and retrieving the document?

Only 5% of learners were very good at creating, saving and retrieving a document; 70% were good at creating, saving and retrieving a document and 25% had fair abilities.

4.2.12. How do you rate your abilities regarding entering data in columns and rows?

None of the learners were very good or good at entering data in rows and in columns; 26% had bare minimum abilities in entering information in rows and in tables and 74% were unable to enter information in rows and in tables.

4.2.14. How do you rate your abilities regarding counting and using formulas?

None of the learners were able to calculate using formulas. There was no indication that learners would acquire these skills because of insufficient time spent during computer literacy lessons.

4.2.15. How do you rate your abilities regarding using graphs?

All learners said they were unable to use graphs. Knowing how to use graphs is part of being computer literate. As learners were not able to use graphs, they had therefore not acquired all computer literacy skills.

The following questions were asked about presentation:

4.2.16. How do you rate your abilities regarding creating a presentation document?

Ninety percent of learners had bare minimum abilities regarding creating a presentation document and 10% did not know how to create a presentation document.

Learners were then asked to answer questions about the Internet.

*4.2.17. Are you able to use the Internet and e-ma*il?

None of the learners were able to use the Internet.

Learners were then asked to answer questions based on their views about computer literacy.

4.2.18. Do you think computer literacy lessons are important to you?

All learners felt that computer literacy lessons were important to them. This again is in line with Wosiyo (2001, p. 10) who contends that: “African people need computers, clothes, food and other necessities. African people have a great desire to learn and to utilise the tools of modern technology.”

4.2.19. Which part of the lesson do you enjoy the most?

Fifteen percent of learners enjoyed the practical part of the computer lesson; 3% liked the theoretical part of the lessons and 82 % liked both the theoretical and the practical part.

4.2.20. Would you encourage learners who are not attending computer literacy lessons to go for computer literacy lessons?

Learners were passionate about computer literacy. All learners indicated that they would encourage other learners to go for computer lessons.

4.2.21. When you leave school would you like to study for a diploma or a degree in information technology?

All learners indicated they would like to study towards an information technology degree or diploma when they have completed their matric year.

4.3. Critical question three

What challenges have you encountered during the teaching and learning of computer literacy?

The following are questions that were posed and the responses:

4.3.1. How many Grade Nine computer literacy learners do you teach computer literacy to?

In School A there were 30 Grade Nine learners who were doing computer literacy. In School B there were 38 Grade Nine learners who were doing computer literacy.

4.3.2. How many computer literacy periods do you have per week?

In School A they had three computer literacy periods of 50 minutes each per week. In School B the educator indicated that there were two computer literacy periods per week with duration of 50 minutes each.

Another question was posed:

4.3.3. Is the time allocated for the teaching and learning of computer literacy sufficient for you and your learners?

The educators in both School A and B felt strongly that the time allocated for computer literacy lessons in their schools was insufficient.

4.3.4. How many computers are there in your school's computer laboratory? Are they all working?

In School A there were 20 computers altogether. Out of 20 computers that were available in School A, only 17 of them were working, but the educator indicated that it was only for a few days that they had three computers that were not working. Their school principal did the repairs to the computers. In School A, a class of 30 Grade Nine learners shared 17 computers when learning computer literacy, as mentioned. This caused overcrowding around computers. In School B there were 15 computers to accommodate 38 learners.

During computer literacy lessons, learners shared computers in groups of three and four. Simons (2005) provides guidelines for what can be done if the school has insufficient computers and maintains that a computer literacy educator can establish a scheduled time for pairs of learners to use computers and to encourage peer tutoring.

4.3.5. Does each learner sit in front of his or her computer during computer literacy lessons or do they share computers? What impact does sharing have on your learners' learning?

In School A the educator indicated that some learners were compelled to share computers because there were insufficient “This has a negative impact on my learners’ learning because not all of them get enough hands-on time with computers.” In School B learners were sharing computers in groups of three and four, as said before.

Not all learners were able to be hands-on with computers when learning different aspects of computer skills. As a result, some of the computer lessons were ineffective in that not all learners were able to benefit.

4.3.6. Do you have a school technical team that helps repair computers that are faulty? If not, who repairs computers that are not working?

In School A they were very lucky to have a school principal who was a computer technician and whenever a problem arose, the principal was there to repair computers and it did not take long (not more than two weeks).

The follow-up question to that response was:

4.3.7. How was the principal able to quickly repair computers on his tight schedule, considering principals are always busy with managerial work and are in and out of the school to attend meetings?

The response to this one was that at times it actually took the school’s principal months to repair computers. In School B they often experienced a problem with computers that were not working. They waited for weeks, even months, for computers to be repaired because they had to take them to the nearest town for repairs. The long waiting period resulted in ineffective teaching and learning of computer literacy.

4.3.8. How often do you experience a problem with computers that are not working?

In both schools they often experienced problems with computers that were not working; as mentioned above it normally took weeks, even months, to repair computers that were not working. This deprived learners of an opportunity to be proficient computer users.

4.3.9. Do you have security guards in your school? Are they there 24 hours a day?

In School A there were no security guards; there was only the caretaker who did a little to provide security in the school. In School B there was only one security guard who controlled exit and entry of people at the gate.

4.3.10. Are there any security guards that work specifically in the computer laboratory? If yes, what is their main task? If no, how do you ensure that the computer laboratory is safe at all times?

In both schools there were no security guards that worked specifically in the computer laboratory. In both schools there were no measures taken to ensure that computer laboratories were safe at all times.

4.3.11. Do you allow your learners to work in the computer laboratory in your absence? If so, how do you ensure that learners do not interfere with the settings of the computer, which might cause damage to the computer?

In School A, learners were not allowed to work in the absence of the educator. In School B the educator indicated that he did not have a say in how the computer laboratory should run. The school management team had a say regarding what happened in the computer laboratory even though they were “computer illiterate”. They did allow learners to work in the computer laboratory alone and, as a result, they often experienced problems with computers that were not working.

4.3.12. Have you and your learners worked together to set rules regarding working in the computer laboratory? If yes, please tell me what the rules are or provide me with a copy of those rules. If there are no rules for working in the computer laboratory how do you maintain order and discipline?

In School A the indication was that there were no rules for working in the computer laboratory but the educator felt strongly that there should be rules to maintain order and discipline. As was mentioned, the educator found it very hard to maintain order and discipline in the computer laboratory during computer literacy lessons.

The educator had to spend a lot of time disciplining learners instead of helping them to acquire computer literacy skills.

There were no measures to ensure that learners were disciplined when working in the computer laboratory. The educator indicated that she used detention and suspension for troublemakers. In School B there were also no rules about working in the computer laboratory.

Another question that was posed was:

4.3.13. Are your school's computers insured? If so, please provide details.

In both School A and B, computers were not insured.

Participant observation was done to collect data for critical question three. Participant observation was undertaken in order to understand whether or not the teaching and learning of computer literacy took place in an environment conducive to learning that had sufficient computers. It was also done to find out if there were rules about working in the computer laboratory posted on the wall.

What transpired during observations was that in both schools, computer literacy classes took place in an environment that was not rich and conducive to learning because there were insufficient computers. There were no rules about working in the computer laboratory.

4.4 Discussion of research findings

When discussing the research findings, the researcher used the principles of the cognitive flexibility theory, as well as guided analysis, in order to tackle all the issues that arose during data collection.

4.4.1. Instructors as facilitators

During the interview session, it emerged that the educator who taught computer literacy at School A was not a teacher by profession but was the school's clerk. The principal of School A was the only one with the capacity to teach computer literacy but was too busy to offer computer literacy to learners.

The school's administration clerk indicated that she was asked to teach computer literacy because it was a non-examinable subject at school. This is in contrast to what Roach (2001, p. 5) argues when saying that Maryland Computer Colleges push computer literacy among South African teachers. Hana (2007, p. 4) states that: "Teachers are agents of change and in order to effect change in the classroom we need to ensure that teachers are competent when it comes to using the tools of the information age."

Maryland Computer Colleges entered into partnership with the South African college system to teach computer literacy among primary and secondary teachers (Roach, 2001, p. 5). Maryland Computer Colleges are not alone in offering computer literacy for South African educators, as various tertiary institutions offer computer literacy courses to educators.

South African educators have to take the initiative and become computer literate so that they can help acquaint learners with computer literacy skills.

The educator in School B did enjoy being a computer literacy educator and what fascinated him was the experience of teaching and imparting knowledge. In both schools, learners in computer literacy did not progress much and abilities were not measured in any way.

Some of the methods that the educators used to teach computer literacy to learners were to show learners how to perform different functions on a computer. (Jacobson and Spiro, 1994) recommended that experience would enable learners to construct their own knowledge representation so that they could use it in various situations. From the observations, it was evident that learners were acquainted with the following computer literacy skills: Microsoft Word, Microsoft Excel and Paint which the researcher felt they should be acquainted with in order to become proficient computer users.

In School C they stopped offering computer literacy in Grade Nine because of the Post Provisional Norms (PPN) that had a great impact on staffing in schools. The Grade Nine computer literacy educator was one of the educators who were identified as being in excess in the school.

Computer literacy was withdrawn from the school's curriculum. School C was then removed as a subject of this study because the research focused on the teaching and learning of computer literacy in Grade Nine. It is surprising that there were learners deprived of an opportunity to be computer literate due to one of the government's policies, that is, the PPN.

This is in contrast to Dr Cassabruri's vision, which states: "Every South African learner in General and Further Education and Training will be information and communication technology-capable by 2010." She went on to say that every school in General and Further Education and Training would be "an E-school" (Cassaburi, 2003, p. 4).

We have approached a period where computer literacy is in demand. South African learners should be acquainted with computer literacy skills but it appears learners are deprived of that opportunity which is in contrast to what Heppell (1993b, p. 30) argues when saying: “The ability to solve problems and to communicate using a computer will be a fundamental facet of literacy in the next century. The children are going to live for another 70 years into the next century and the significant part of their lives will be to do with technology. It is critically important that they have the understanding to be proactive in that world both in work and in leisure.”

Only one principle of the cognitive flexibility theory was adhered to in the teaching and learning of computer literacy. During the teaching and learning of computer literacy, learners were facilitated in such a way that they created different versions of work using a computer.

4.4.2. Instructors as task managers

When a question was posed on the issue of the curriculum it was evident that both in School A and B there was no curriculum designed for Grade Nine computer literacy lessons. There were no guidelines that the educators were following in the teaching and learning of computer literacy. There was no evidence of planning of work, contrary to what Wilson (1996, p. 50) alluded to when stating that “instructors are also viewed as task managers whose functions are to set tasks, provide guidance and feedback”.

The educators taught whatever they felt necessary. This is in contrast to what Ediger (1994, p. 1) contends when saying: “The design of the curriculum needs careful consideration so that each pupil may attain as optimally as possible. Learners must experience interest, meaning and the purpose in a teaching-learning situation. Quality design in the curriculum may well guide pupils individually to attain as much as possible.”

In both schools it was evident that learners were not guided in order to get meaning out of what they were doing, in that when the question was posed as to whether learners were assessed to measure their progress, the answer to that was no (in School A). In School B they were assessed even though the educator did not keep any records of learners' progress.

A question was posed regarding what methods educators used in the teaching and learning of computer literacy.

In School A the educator used the telling and the demonstration method in conjunction with the hands-on method. When telling learners to perform certain functions on the computer, learners were instructed to use the computer to perform various functions and that included creating word documents and formatting them.

4.4.3. Multiple presentations of content

During teaching, the educator only instructed learners regarding what they should do on the computer. In School B the educator tried to integrate methods even though it became evident from the interviews that the telling method was the most prevalent method in the teaching of computer literacy. One method of imparting knowledge was the one of providing multiple presentations of content (Jacobson & Spiro, 1994, p. 25). This is one of the teaching principles in the cognitive flexibility theory. Learners were also given a chance to get hands-on experience with computers in the above-mentioned school.

The methods of teaching computer literacy were very limited and that limits learners' chances to explore different aspects of a computer. The effective teaching and learning of computer literacy is attained when one adheres to the principles of the cognitive flexibility theory. One needs to understand that individual learners are unique and that they individually construct meaning. In the teaching and learning of computer literacy one has to provide multiple presentations of content (Jacobson & Spiro, 1994, p. 25), as previously quoted.

Educators need to present content using multiple methods in order to accommodate individual learners and to help learners acquire relevant computer literacy skills (Jacobson & Spiro, 1994).

4.4.4. The use of case-based instruction

Educators also need to understand that computer literacy should not be taught in a vacuum or as an isolated subject; case studies should be used to help broaden a learner's mind to encompass the real-world challenges that can be tackled using computer literacy skills. In that way learners might be encouraged or motivated to embark on computer literacy lessons.

Jacobson and Spiro (1994, p. 30) assume that the use of a variety of case-based instructions will enable learners to acquire vast knowledge of the use of computers in a variety of contexts. (Rusten, 2004) states that many schools teach learners about computers, which include word processing, presentation and spreadsheets. Rusten recommends this approach to teaching and learning computer literacy if it is used to serve as a base that will acquaint learners with skills they require in order to integrate computers into learning different subjects.
The researcher strongly believes that learners do need to be acquainted with computer literacy skills so that they can effectively integrate computers into learning different subjects.

4.4.5. Hands-on experience

One other very useful method of imparting computer literacy skills is to enable learners to get hands-on experience with computers which will enable individual learners to construct their own knowledge presentations so that they will use it in a variety of situations (Jacobson and Spiro, 1994, p. 25).

Hands-on experience might also help equip learners with multiple computer skills such as the speed required when one is creating different text documents.

Hands-on experience might also help in instilling the love of computers in learners as some learners do not feel comfortable when sitting in front of a computer. Learners should also be led to self-directed learning, content knowledge and problem-solving skills.

None of the methods that the educators used in both schools included exposing learners to complex situations. Exposing learners to complex situations is where learners might be asked to present one version of work using different software, for example presenting information using text in Microsoft Word and then presenting the same information using graphs provided by Microsoft Word or Microsoft Excel or PowerPoint.

Participant observation was done for critical question one. The researcher was able to spend two and a half hours in each school doing participant observation, to obtain in-depth information. The researcher was fully involved in the setting that she was studying. (Terre Blanche and Kelly, 1999) define participant observation as the data collection method where the researcher becomes fully involved in the setting being studied.

The research findings indicate that not all learners were able to sit in front of a computer during computer literacy lessons, as in School A there were 20 computers with only 17 computers that were working, and in School B there were 15 computers to serve 38 learners. This confirms what Corbin, Kelman, Roberts, Snyder, Watt and Wanner (1989, p. 5) believe when they say that a computer is a rich and complex tool that is increasingly within the financial means of a school to acquire. If the school does not have sufficient funds to acquire sufficient computers, that does not prevent stakeholders (educators, parents and the Department of Education) from entering into partnerships with organisations that are there to help schools acquire computers so as to increase computer literacy among learners.

The South African National Department of Education should set aside a budget for purchasing computers for schools, especially schools in rural areas that were previously disadvantaged.

4.4.6. Learning environment

Figure 4.2: A learning environment in the computer laboratory in School B

Figure 4.3: A learning environment in the computer laboratory in School A

During participant observation the researcher engaged in the teaching and learning of computer literacy. Learners' behaviour was not good. When learners would not listen to the educators' instructions, the educator had to spend about five minutes trying to maintain order, and as soon as learners were settled the lesson began.

During the observation it was evident that principles of the cognitive flexibility theory were not adhered to; only the first principle was adhered to, that is, learners should be facilitated in such a way that they create different versions of work.

Participant observation was also undertaken to understand whether or not the teaching and learning of computer literacy took place in a conducive learning environment. Both schools had computer laboratories. The study on computer laboratories in the United States indicated that all schools had computer laboratories and that some computers were installed in classrooms. As South Africa is still a developing country it is sufficient that computers are installed in computer laboratories only.

Computer laboratories in both schools were available and there were computers in the laboratories even though they were insufficient in number. This is in line with what Wilson (1995) states, when saying that the learning environment contains a learner, a space, or a setting where the learners interact with the tools and devices in creating, communicating, producing and publishing their work. In both schools learners were not enabled to communicate, publish, or to produce their work.

During the teaching and learning of computer literacy, learners entered computer laboratories that had computers, even though there were not enough. In the computer laboratory the ratio of learners per computer should be 1:1 (one learner per computer). The researcher aspires to that during the teaching and learning of computer literacy. The ratio of 1: 1 avoids overcrowding around computers that might steal an individual learner's chance to get hands-on experience with computers (Asmal, 2003). In School A there were 17 computers that were working. A class of 30 Grade Nine computer literacy learners were using 17 computers for learning computer literacy.

When more than two learners share a computer this causes overcrowding around computers and learners tend to be noisy when working on the same computer and fight for who is going to touch the computer first. The school educator was then faced with the challenge of disciplining those learners. In School B there were 15 computers to accommodate 38 Grade Nine computer literacy learners. During computer literacy lessons learners were sharing computers in groups of three and four.

Figure: 4. 4. Learners sharing one computer in School A

In both schools the researcher found no rules regarding working in the computer laboratory. Rules about working in the computer laboratory were not posted on the wall and there was no indication that there were rules, judging from the bad behaviour that learners demonstrated when working in the computer laboratory. It is advisable to have a set of rules to follow in the computer laboratory, which will help to encourage learners to behave responsibly. Rules about working in a computer room should be made to ensure that computer lessons are efficiently conducted and meaningful (Starr, 2004).

Figure 4.5: The computer room in School B with no rules regarding working in the computer laboratory posted on the wall

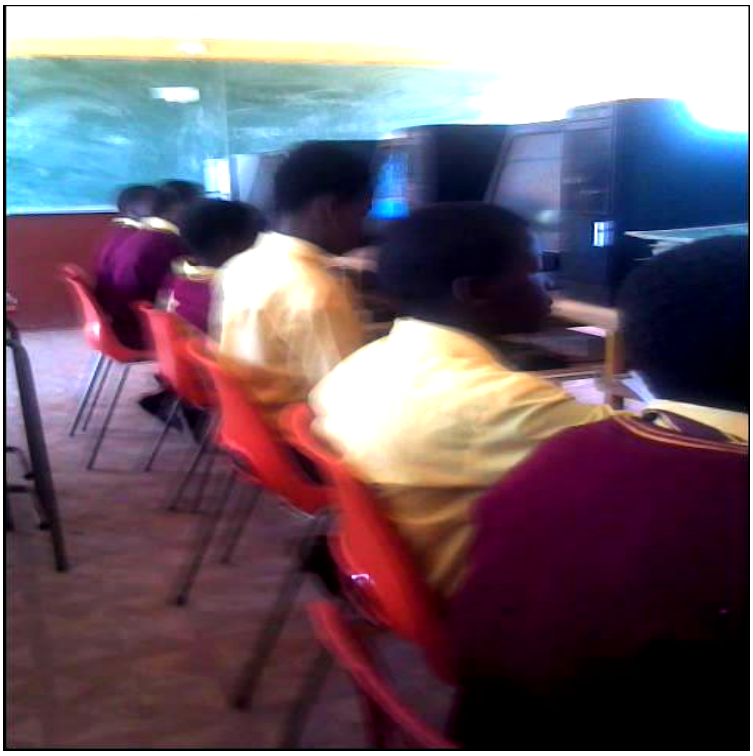

Figure 4.6: The computer laboratory in School A with no rules regarding working in the computer laboratory posted on the wall

Learners, together with educators, can work out the rules of working in the computer laboratory. This might help eliminate the costs that might be involved in repairing computers that have been damaged by learners. In both schools learners used Microsoft Windows Vista and the Intel Pentium 4 computers. Barret (2001, p. 46) states, the Intel Pentium 4 processors and Microsoft Windows Vista bring about unprecedented performance and capability in today's home and business. It is therefore imperative that learners get hands-on experience with computer hardware and software used in homes, offices and industry.

4.4.7. Learning

What became apparent during the interviews for critical question three was that computer literacy is a non-examinable subject in both the schools, and as a result time allocated for computer literacy lessons was minimal. The educators felt that when learners went for computer literacy lessons they needed to spend more time there so that they grasped computer literacy skills. Bitter (1996, p. 10) states: “Because computers are such an important part of our lives we need to know a little bit of how they work.” The researcher feels strongly that learners do not need to know a “little bit” of how computers work, but more importantly they need to be experts in computer literacy skills, through effective computer literacy teaching and learning.

If the teaching of computer literacy continues to be allocated such a limited time, learners will develop bare minimum computer literacy skills and they will not develop the love of computers in order to use them effectively. This will promote what Meyer (2004, p. 74) says about people who lack computer literacy skills: “They will not be able to compete for the best jobs. Experts worry about the developing gap between the technologically haves and have-nots.” This study indicated that the educators were unable to successfully bridge the gap between the technological have and have-nots as computer literacy is allocated limited time as it is a non-examinable subject at schools. If educators are passionate about computer literacy they need to insist that computer literacy be included in the school curriculum and be valued like all other subjects.

School A hardly experienced problems with computers that were not working. School B often experienced problems with computers that were not working because technicians were too far from the school to help repair computers. Rules about working in the computer laboratory might help people make informed choices when working in the computer laboratory and thus avoid technical problems that might arise.

Bigelow (2009) states that there are four categories for users: computer users, which refers to people who use a computer for word processing, spreadsheets, database managers and accounting programmes; computer programmers, who are people who do not only work with existing computer programmes, but people who install different programmes that run on computers; computer technicians, who repair computers, and computer designers who design new computers and computer parts.

Computer literacy skills that learners acquire at school may help learners engage in different categories of computers at a later stage. This confirms what Corbin, Kelman, Roberts, Snyder, Watt and Wanner (1989, p. 12) feel; they see a computer as a rich and a complex tool that is increasingly within the financial means of schools to acquire.

Nowadays the crime rate is increasing, and this includes theft of computers. Computers are targeted devices by thieves because of their high monetary value. If a school has computers there should be tight security. In both schools there were no security guards in the computer laboratories; there was only the school's gate security guard at School B and the school's caretaker. School A did nothing to monitor the computer laboratory.

In School A they did not allow individual learners to work in the computer laboratory without supervision and as a result they did not experience as many problems with computers that were not working. In School B they allowed individual learners to work in the computer room in the absence of an educator or without being monitored, and as a result they often experienced problems with computers that were not working. Wilson (1995, p. 20) defines a learning environment as a place where learning is fostered and supported. Learners should be supported when working in the computer laboratory to avoid technical problems that might arise.

After the interviews were conducted for critical question three it was evident that in both schools no rules had been worked out for working in the computer laboratory, and as a result educators were unable to maintain order and discipline during computer literacy lessons. The educator and learners can work out rules for working in the computer laboratory so that learners will interact with the computers responsibly. Rules for working in a computer room should be made to ensure that computer lessons are accurate and meaningful (Starr, 2004).

In both School A and B computers were not insured which means that if there was theft or a fire that could damage computers, the schools would not have access to money from any insurance company to replace these computers.

4.4.8. Knowledge construction

When learners were asked about their feelings when it was time to go for computer literacy lessons, learners in both schools responded positively; all of them were enthusiastic about computer literacy lessons. When Wosiyo (2001, p. 10) conducted a study on the needs for African people the findings of the study were that Africa people did need computers: “African people have a great desire to learn and utilise the tools of modern technology.” Learners in both School A and B were eager to use computers and to be computer literate. Insufficient or no computers at schools are going to shut down learners’ ambitions to become computer literate.

Learners at both schools were not certain about the time allocated for computer literacy lessons. In both schools 50 minutes was allocated for computer literacy lessons per week.

Considering the fact that both schools had insufficient computers for the teaching and learning of computer literacy, computer literacy lessons should be allocated a sufficient time so that all learners get enough time to have hands-on experience with computers.

When asked about their abilities on different computer sections, the participants said that insufficient time was spent on computer lessons. Insufficient computers lead to overcrowding around computers and many learners did not get hands-on experience with computers. There were no aims or objectives as the educator in School A indicated that she just taught what she felt necessary. Greenwood (1993, p. 60) contends that: “Another very emotive subject with teachers, pupils and computer-literate parents is that of the depth or lack of knowledge at schools.” Insufficient computers at schools and the limited time spent during computer literacy lessons are going to perpetuate the lack of computer skills.

Another factor is that educators are teaching computer literacy without a specific curriculum designed for the schools; no guidelines were followed. This is in contrast to what Southwood (2001, p. 10) has said: “Over 60% of current job opportunities require computer literacy. If the teaching and learning of computer literacy is not looked at closely, South Africa is going to continue producing a workforce that is lacking computer literacy skills. Another contributing factor to the disrupted teaching and learning of computer literacy is lack of curriculum planning”. Ediger (1994, p. 10) contends that: “The design of a curriculum needs careful consideration so that each pupil may attain as optimally as possible. Learners must experience interest, meaning and purpose in the teaching and learning situation.”

4.5. Conclusion

Educators and learners responded very well. Data collected indicates that a lot needs to be done concerning computer literacy in Grade Nine. Photos were used to enable readers to follow the line of argumentation and discussion.

5. CHAPTER FIVE

This chapter covers the conclusion of the discussion about the teaching and learning of computer literacy at schools. Recommendations are made as it was evident from data that there were many inadequacies in the teaching and learning of computer literacy.

5.1. Conclusion

Computer literacy is in demand. All aspects of our society needs people who are computer literate. We are now into the 21st century and computer literacy is essential. Schools serve as the foundation for imparting computer literacy skills to learners. The stakeholders in the education sector have to ensure that when learners leave school they are equipped with computer literacy skills needed to function in society.

5.2. Recommendations

Data collected from data sources for the three critical questions clearly indicates that the teaching and learning of computer literacy is ineffective in both School A and School B. What makes the teaching and learning of computer literacy ineffective is that computer literacy is not taken as seriously as other learning areas as it is not included in the schools' curriculum. As computer literacy is not included in the schools' curriculum there is no curriculum with assessment guidelines in place to guide teaching and learning and to assess learners. In School A computer literacy is taught by the school's administration clerk - someone who has a certificate in information technology, but who is not familiar with teaching methods. As a result she did not know that it was necessary to assess learners' progress. In both schools computer literacy was allocated insufficient time with insufficient computers, and as a result not all learners got enough time to have hands-on experience with computers, and in both School A and School B there were no rules for working in the computer laboratory.

In School B they often experienced problems with computers that were not working. This ought to be brought to the attention of stakeholders such as the officials of the Department of Education's educational technology specialisation staff, school principals, educational technology educators and parents. Stakeholders need to work together and seek ways to resolve this issue.

These findings apply to the two high schools where research was conducted but they might apply to other schools as well as they are probably a microcosm of what is happening in this subject area.

The recommendations are that computer-aided technology subject advisors, who are stationed in different districts, should visit schools on a regular basis to find out if there are any challenges that educators are encountering in the teaching of computer literacy. This might bring about effective teaching and learning in computer literacy.

Teacher training institutions need to equip students in educational technology specialisation and curriculum planning skills so that educators do not encounter problems in designing and planning the curriculum.

The school principals need to ensure that computer literacy is valued like all other subjects and that the subject is included in the school curriculum. The school management teams should ensure that computer literacy is not taught as an extra subject but valued as a meaningful subject that learners need in order to function in almost all workplaces in society. Eisenberg and Johnson (1998, p. 78) contend that: "The end results of computer literacy are not necessarily knowing how to operate a computer, but how to use technology as a tool for organisation, communication, research and problem-solving skills."

5.3. Conclusion

All stakeholders in the field of educational technology should take the initiative in ensuring that schools get sufficient computers to equip learners with necessary computer literacy skills. People in the private and public sector should help in providing schools with computers so that learners will be computer literate before they attend tertiary institutions and enter workplaces as workers.

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APPENDICES

APPENDIX A

A letter to the school principal

Vulindlela Store
P. 0. Box 50
Kranskop
3268
09 January 2007

Dear Sir

I, Nozipho Rejoice Xhakaza, (Registration number 9900880) am a 2nd year Masters in Education student at the University of KwaZulu Natal (Edgewood campus). My specialisation is educational technology and my research project entails the exploration of the teaching and learning of computer literacy in Grade Nine. My study aims at informing all stakeholders in the field of educational technology about the situation on the teaching and learning of computer literacy and to provide some recommendations.

I would like your school to be the subject of my study. Whilst conducting research I will try by all means not to interfere with the teaching time. I would like to ensure that data gathered from your school will be treated with confidentiality. I will be the only one to keep data gathered from your school. Participants from your school will be allowed to view data before it is presented to the public. Nowhere in the research project will your school or participants from your school be mentioned by name.

If you need to verify the information given above you may contact my supervisor: DR. Bheki Khoza at, khozas@ukzn.ac.za: Telephone number: 031 260 7595.

I will be very glad if my request receives your immediate attention and response.

Thank you

_____

Nozipho R. Xhakaza

APPENDIX B

A letter to Grade Nine learner's parents

Vulindlela Store
P. 0. Box 139
Kranskop
3268
09 January 2007

Dear parent

I, Nozipho Rejoice Xhakaza, am a Master of Education student at the University of KwaZulu Natal (Edgewood Campus). I'm currently doing my research at a school where your child is a learner. My research will be conducted in Grade Nine classes of learners doing computer literacy. I would like your child to be a participant in my study.

My research involves the exploration of the teaching and learning of computer literacy in Grade Nine. The study aims at finding out if the teaching and learning of computer literacy does actually equip learners with computer literacy skills required in the workplace. If you allow your child to be the participant in the study, nowhere in the research project will your child be mentioned by name.

After the research report is compiled you will be allowed to view it before it is presented to the public. Your child will be required to participate in the research for five hours in five days (one hour per day). I assure you that my involvement with your child will not interfere with his or her school work. During data collection, I will take photographs of children and include them in my study when analysing data.

Please note your child's involvement in the study is voluntarily and if you do not want your child to participate in the study that will not disadvantage him or her in any way. If you wish your child to be withdrawn from the study at any time you may do so.

If you wish to verify all the information given above you may consult my supervisor. DR Bheki Khoza, E mail address khozas@ukzn.ac.za, cell number: 031 260 7595.

Thank you

_____

Nozipho R. Xhakaza

Please fill in the attached consent form and return it

Parent's declaration form

I _____Full names of a parent.

_____

Signature

Please put an x in the appropriate box

Allow my child to participate in the study ☐

Do not allow my child to take part in the study ☐

APPENDIX C

IsiZulu version of a letter to parents

Vulindlela Store
P. O. Box 139
Kranskop
3268
09 January 2007

Mzali

Mina Nozipho Rejoice Xhakaza ngingumfundi wasenyuvesi yakwaZulu Natali owenza iziqu zeMasters. Ngenza ucwaningo mayelana nokufunda nokufundiswa kwezifundo zamamakhompyutha eskoleni lapho kufunda khona umntwana wakho. Ngicela umntwana wakho ukuthi abe yingxenye yalolu cwaningo. Uzonikezwa imibuzo azoyiphendula.

Isihloko socwaningo lwami: Ukucubungula ukundwa nokufundiswa kwamaphompyutha ebangeni lesi-9. Ngalolu cwaningo ngihlose ukuthola ukuthi ngabe ukufunda nokufundiswa kwezifundo zamakhompyutha kwenzeka ngendlela ezobasiza abafundi bathole amakhono adingekayo ezindaweni zokusebenza.

Okwenze ngafuna ukwenza lolucwaningo ukuthi ulwazi namakhono okusebenzisa amakhompyutha kubaluleke kakhulu esikhathini samanje. Cishe yonke imisebenzi eyenziwayo idinga ukuthi umuntu akwazi ukusebenzisa amakhompyutha.

Ukuba yingxenye yalolu cwaningo kumntwana wakho kungukuzikhethela akuyona impoqo noma ngabe uvumile ukuthi unmtwana wakho abe yingxenye yalolu cwaningo uma ungasathandi ukuthi aqhubeke nalo ungamyekisa noma ngabe yongasiphi isikhathi.

Ngiyethembisa ukuthi akukho lapho igama lomntwana wakho lizovezwa khona kulolu cwaningo. Ulwazi engizobe ngiluthole kumntwana wakho ngizobe ngilugcine kukhompyutha yami engikwazi ukuyivula mina kuhela ngenombolo eyimfihlo. Ngesikhathi socwaningo ngicele ukumthatha izithombe umntwana wakho engizoziaka ebhukwini licwaningo kodwa ngizozenza zingabonakali kahle ukuvikela umntwana wakho.

Ukuthola ubufakazi bakho konke osekushiwo lapha ngenhla ungathintana nomeluleki wami uDokotela: Bheki Khoza inombolo yakhe yocingo, 031 260 7595.

Obhalile

_____

uNozipho Xhakaza (NKSZ)

Ngicela ugcwalise ifomu elinamathiselwe ngemuva ulibuyise nomntwana.

Mina (Igama nesibongo somzali)_____

_____

Sayina

Ngicela wenze isiphambano ebhokisini eliseceleni kwalokho akukhethile.

Ngiyavuma ukuthi unmtwana wami abe yingxenye yocwaningo ☐

Angivumi ukuthi unmtwana wami abe yingxenye yocwaningo ☐

APPENDIX D

A letter to Grade Nine computer literacy learners

Vulindlela Store
P. O. Box 139
Kranskop
3268
09 January 2007

Dear Sir / Madam

I, Nozipho Rejoice Xhakaza, (registration number 9900880) am a Master of Education student at the University of KwaZulu-Natal, Edgewood campus. My specialisation is educational technology. I am very passionate about the field of educational technology. My interests are in improving the field of educational technology. My research project focuses on the teaching and learning of computer literacy.

I would like you to be a participant in my study. The study includes conducting interviews with you and class visits for participant observation. I assure you that information obtained from you will be treated with confidentiality. I will be the only one who will have access to that information; you will also be allowed to view information for verification before it is sent to the public.

If you wish to verify all the information given above you may consult my supervisor, DR. Bheki Khoza, E mail address, khozas@ukzn.ac.za: Telephone number, 031 260 7595

I will be very glad if my request receives your immediate attention and response.

Thank you

_____

Nozipho R. Xhakaza

APPENDIX E

INTERVIEW SCHEDULE FOR CRITICAL QUESTION ONE

General information

What are your views on the changes that are currently taking place in the education system, particularly in the curriculum?

_____
_____
_____
_____
_____
_____

For how long have you been a computer literacy educator in Grade Nine, and what are some of your experiences?

_____
_____
_____
_____
_____

How do you teach computer literacy in Grade Nine?

_____
_____
_____
_____
_____

How do you assess your learners?

_____
_____

_____
_____
_____

Are there any guidelines that you follow?

_____
_____
_____
_____
_____
_____

Do you have a subject framework and a work schedule for teaching and learning of computer literacy in Grade Nine ?

_____
_____
_____
_____
_____
_____

With what computer literacy skills have you acquainted learners?

_____
_____
_____
_____
_____

Does your teaching of computer literacy motivate learners to create, communicate, produce and publish using computers?

_____
_____

APPENDIX F

Participant observation

- Participant observation was done in order to triangulate.
- The researcher was engaged in the computer literacy classroom for five hours (one period each day).
- Participant observation was carried out to collect data for both critical questions 1 and 3.

APPENDIX G

Questionnaire

Critical question 2

What computer literacy skill have learners acquired during the teaching and learning of computer literacy?

Instructions

- **Do not write your name on the questionnaire**
- **Put a cross (x) in the appropriate block**
- **In question 1.2. write the number**

The following questions are based on word processing

.

1.1. How do you feel when it is time to go for computer literacy lessons?

Happy	Sad

1.2. How many computer literacy periods do you have per week?

_____

1.3. Do you think that the time you spend during computer literacy lessons is sufficient for you to acquire computer literacy skills?

YES	NO

1.4. How do you rate your abilities regarding computer programmes?

GOOD	FAIR	WEAK

1.5. How do you rate your abilities regarding creating, saving, and printing a Word document?

VERY GOOD	GOOD	FAIR	WEAK

1.6. How do you rate your abilities regarding inserting tables and drawing lines?

VERY GOOD	GOOD	FAIR	WEAK

1.7. How do you rate your abilities regarding deleting, and inserting pictures?

VERY GOOD	GOOD	FAIR	WEAK

1.8. How do you rate your abilities regarding underlining, bold, centre align, align right and left, and justify?

VERY GOOD	GOOD	FAIR	WEAK

1.9. How do you rate your abilities regarding margins, page setup and paragraphs

VERY GOOD	GOOD	FAIR	WEAK

1.10. How do you rate your abilities regarding spell check?

VERY GOOD	GOOD	FAIR	WEAK

1.11. How do you rate your abilities regarding creating, saving, and retrieving the document?

VERY GOOD	GOOD	FAIR	WEAK

1.12. How do you rate your abilities regarding entering data in columns and rows?

VERY GOOD	GOOD	FAIR	WEAK

The following are questions based on spreadsheets

1.13 How do you rate your abilities regarding counting using formulas?

VERY GOOD	GOOD	FAIR	WEAK

1.14. How do you rate your abilities regarding using graphs?

VERY GOOD	GOOD	FAIR	WEAK

The following question will be asked about presentation

1.15. How do you rate your abilities regarding creating a presentation document?

VERY GOOD	GOOD	FAIR	WEAK

The following question is about the use of the internet and E-mail

1.16. Are you able to use the Internet and E- mail?

YES	NO

General views about computer literacy lessons

1.17. Do you think computer literacy lessons are important to you?

YES	NO

1.18. Which computer section do you enjoy the most?

THEORY	PRACTICAL	BOTH

1.19. Would you encourage learners who are not attending computer literacy lessons to go for computer literacy lessons?

YES	NO

1.20. When you have completed school would you like to study for a diploma or a degree in information technology?

YES	NO

APPENDIX H

INTERVIEW SCHEDULE FOR CRITICAL QUESTION 3

How many Grade Nine computer literacy learners do you teach computer literacy?

_____
_____
_____
_____
_____

How many computer literacy periods do you have per week?

_____
_____
_____
_____
_____

Is the time allocated for the teaching and learning of computer literacy sufficient for you and your learners?

_____
_____
_____
_____
_____

How many computers are there in your school's computer laboratory? Are they all working?

_____
_____
_____

_____

_____

Does each learner sit in front of his or her computer during computer literacy lessons or do they share computers? What impact does that have on your learners' learning?

_____

_____

_____

_____

_____

Does the school have a technical team that helps repair computers that are faulty? If not, who repairs computers that are not working?

_____

_____

_____

_____

_____

How often do you experience a problem with computers that are not working?

_____

_____

_____

_____

_____

Do you have security guards in your school? If so, are they there twenty-four hours a day?

_____

_____

_____

_____

_____

Are there any security guards that work specifically in the computer laboratory? If yes, what is their main task? If no, how do you ensure that the computer laboratory is safe at all times?

_____
_____
_____
_____
_____

Do you allow your learners to work in the computer laboratory in your absence? If so, how do you ensure that learners do not interfere with the settings of the computer, which might cause damage to the computer?

_____
_____
_____
_____
_____

Have you and your learners worked together to set rules for working in the computer laboratory? If yes, please tell me what the rules are or provide me with a copy of those rules. If there are no rules for working in the computer laboratory, how do you maintain order and discipline?

_____
_____
_____
_____
_____

Are your school's computers insured? If so, please provide details.

_____
_____
_____

DECLARATION

I, **Nozipho Rejoice Xhakaza,** declare that this dissertation is my own work and has not been submitted previously for any degree.

Researcher Date

_____ _____

Supervisor Date

_____ _____

ACKNOWLEDGEMENTS

I wish to express my sincere gratitude and thanks to the following individuals without whom the completion of this dissertation would not have been possible:

- To the Almighty God for giving me strength to continue with the project through difficult times

- My supervisor, Dr Bheki Khoza, for his informed and excellent advice, motivation, patience and guidance throughout the study.

- To my participants for their time.

- To the proof reader, Jill D' Eramo

DEDICATION

This dissertation is dedicated to my son, **Mthokozisi**, my husband, **Thembinkosi,** my parents, **Fanyana** and **Philisiwe,** and the **Nodlela** family as a whole. Thank you for your encouragement, support and perseverance, when I had to be away from home frequently whilst conducting this study.

ABSTRACT

This study involves an exploration of how learners are guided towards the acquisition of computer literacy skills required to function effectively socially, economically and politically. The teaching and learning of computer literacy is an educational issue, which is better understood if using the interpretive paradigm, which is concerned with understanding. Qualitative research methods were used in collecting data; semi-structured interviews were used together with participant observations. Telephone conservations and questionnaires were useful even though the study is qualitative in nature; questionnaires helped in collecting data from a large number of learners.

When learners engage in computer literacy lessons the lessons should be facilitated in such a way that learners get hands-on experience with computers. Computer literacy lessons should be structured and framed within the principles of the cognitive flexibility theory which involves: 1. The design of learning environments. 2. Avoiding over-simplifying instructions. 3. Providing multiple presentations of content. 4. Emphasising case-based instructions. 5. Encouraging contextual-dependent knowledge 6. Emphasising knowledge construction. 7. Supporting complexity of instruction. During the learning process learners should be taught in such a way that they create, communicate, produce and publish their work. Unfortunately the findings in the study indicate that the teaching and learning of computer literacy is ineffective. As computer literacy is not included in the schools' curriculum there is no curriculum with assessment guidelines in place to guide teaching and learning, and assessing learners in grade 9. In both school A and school B computer literacy is allocated insufficient time with insufficient computers and as a result not all learners get enough time to have hands-on experience with computers.

Stakeholders that include educational technology departmental officials, educators and principals should ensure that the teaching and learning of computer literacy happens effectively by including computer literacy in the schools' curriculum.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF ABBREVIATIONS
CD - Compatible disc
CD ROM - Compact disc read-only memory
DOE- Department of Education
E mail- Electronic mail
E school- Electronic school
FET - Further Education and Training
GET - General Education and Training
ICT- Information and Communication Technology
KZN- Kwazulu-Natal
NCS - National Curriculum Statement
NGO- Non-Governmental organisation
PCS - Personal Computers
PPN – Post Provisional Norms
RSA- Republic of South Africa
SAOU - Suid-Afrikaanse Onderwysersunie
USA-United States of America

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