STUDENT NAME: MZIKAYISE RICHARD SONKWALA
STUDENT NUMBER: 208107443
MODULE CODE: 504
LECTURER NAME: Dr GWENDOLYN WELLMANN
ASSIGNMENT NUMBER: Final
ASSIGNMENT TITLE: THE EXTENT OF THE USE OF ICT IN SCHOOLS IN THE NELSON MANDELA BAY AREA
Please type or complete in black ink

**FACULTY:** ______**Business and Economic Sciences**____________________________

**SCHOOL/DEPARTMENT:** ______ **Development Studies**____________________________

*I,* (surname and initials of supervisor) _____ G. Wellmann__________________________

the supervisor for (surname and initials of candidate) ________________________________

Mzikayise Richard Sonkwala ______________________________________________________

(student number)___208107443 ____a candidate for the (full description of qualification)

__________________________

with a treatise entitled (full title of treatise):

**The extent of the use of ICT at schools in the Nelson Mandela Bay Area**

__________________________

considering the following ethics criteria (please tick the appropriate block):

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<th>YES</th>
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<td>1. Is there any risk of harm, embarrassment of offence, however slight or temporary, to the participant, third parties or to the communities at large?</td>
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<td>2. Are particular characteristics of the target groups required (e.g. age, cultural derivation, background, physical characteristics, disease status etc.)?</td>
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<td>3. Does the data that will be collected require consent of an institutional authority for this study?</td>
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<td>5. Will feedback be given to participants?</td>
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Please note that if any of the questions above have been answered in the affirmative the student will need to complete the full ethics clearance form and submit to the Faculty Ethics Coordinator.

hereby certify that the student has given his/her research ethical consideration and full ethics approval is not required.

20 May 2011

__________________________________________   ______________________________________
SUPERVISOR / PROMOTER                          DATE

__________________________________________   ______________________________________
HEAD OF DEPARTMENT                                DATE

Please ensure that the research methodology section from the proposal is attached to this form.
APPENDIX I
PERMISSION TO SUBMIT A TREATISE/DISSERTATION/THESIS
FOR EXAMINATION

Please type or complete in black ink

FACULTY: Business and Economic Sciences

SCHOOL/DEPARTMENT: Development Studies

I, (surname and initials of supervisor/promoter) G. Wellmann

and (surname and initials of co-supervisor/co-promoter)

the supervisor/promoter and co-supervisor/co-promoter respectively for (surname and initials of candidate) Mzikayise Richard Sonkwa

(student number) 208107443 a candidate for the (full description of qualification) Masters in Development Studies


The extent of the use of ICT at schools in the Nelson Mandela Bay Area

hereby certify that we give the candidate permission to submit his/her treatise/dissertation/thesis for examination.

SUPERVISOR / PROMOTER

DATE

CO-SUPERVISOR / CO-PROMOTER

DATE

As approved by Senate on 10 November 2005
with adjustments by Exams office on 24 October 2008
DECLARATION BY STUDENT

NAME: MZIKAYISE RICHARD SONKWALA

STUDENT NUMBER: 208107443

QUALIFICATION: MASTERS IN DEVELOPMENT STUDIES

TITLE: THE EXTENT OF THE USE OF ICT IN SCHOOLS IN THE NELSON MANDELA BAY AREA

DECLARATION:

In accordance with Rule G4.6.3.1 hereby declare that the above-mentioned treatise/dissertation/thesis is my own work and that it has not previously been submitted for assessment to another University or for another qualification.

SIGNATURE: ..........................................................

DATE: 15 NOVEMBER 2011
ABSTRACT

It is the 21st Century and the world is a global village. The development of technology like Information and Communication Technology (ICT) has thus become the dominant means of communication. Education has not been left out of this wave of change. In many countries Information and Communication Technology (ICT) has a clear impact in the development of educational curriculum. This cannot be said about South Africa where huge disparities in terms of ICT related resources still exist. There is a range of uses of ICT in South African schools and it varies according to the economic and social conditions where that school is located. For example, the former Model C schools are well-resourced in terms of computers and access to internet whilst township schools lack these resources. In township schools very few students are exposed to computers due to the limited number of computers and lack of properly qualified educators in the field of ICT. In the Nelson Mandela Bay area township schools only offer CAT (Computer Applications Technology) as an ICT related subject whilst the former Model C schools offer CAT and IT (Information Technology). This treatise attempts to show the digital divide that still exists between a former Model C school and a township school, and the impact it has in quality of education in these schools.
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# ACRONYMS

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<th>Acronym</th>
<th>Definition</th>
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<tbody>
<tr>
<td>CAT</td>
<td>Computer Applications Technology</td>
</tr>
<tr>
<td>DoE</td>
<td>Department of Education</td>
</tr>
<tr>
<td>FET</td>
<td>Further Education and Training</td>
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<td>HOD</td>
<td>Head of Department</td>
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<tr>
<td>ICT</td>
<td>Information and Communication Technology</td>
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<td>IT</td>
<td>Information Technology</td>
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<tr>
<td>NSC</td>
<td>National Senior Certificate</td>
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<td>OBE</td>
<td>Outcomes Based Education</td>
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<tr>
<td>SES</td>
<td>Subject Education Specialist</td>
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<td>SGB</td>
<td>School Governing Body</td>
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<tr>
<td>VSAT</td>
<td>Very Small Aperture Terminal</td>
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CHAPTER1 - INTRODUCTION

1.1 BACKGROUND
Communication technology is growing around the planet annually at a faster rate. It allows communication from anywhere to anywhere where there is appropriate infrastructure. In a developing country like South Africa, ICT is seen as one of the ingredients for development especially in the field of education.

South Africa consists of nine provinces. The Eastern Cape is one of these provinces and it is very poor, this is largely due to the poverty found in former homelands, where subsistence agriculture predominates (Times Live, 27 July 2011). The province has two major cities, the biggest being Port Elizabeth (Nelson Mandela Bay) and is known as the economic hub of the province. The second city is East London. In the sphere of education the province is amongst the worst performing in terms of administration and the performance of grade 12 learners. It was 2nd last in 2010 in terms of Grade 12 results achieving a mere 58.3 percentage pass. In March 2011, the Eastern Cape education department was placed under administration by the national government because of its constant inefficiencies (Herald, 5 May 2011). As of the 5th of May 2011, 2 380 schools still had no stationery which should have been delivered in January. Port Elizabeth, which is the area of study, has eighty high schools. Thirty-seven of these high schools offer Computer Applications Technology as a subject and seven of them also offer Information Technology. These two subjects are only offered to learners in the Further Education and Trainingband (FET) for example grade ten to grade twelve. According to Subject Education Specialist (SES) in the Port Elizabeth area each of the high school has a class dedicated fore-learning (each teacher has an access to a computer to teach his specific subject).

1.2 INFORMATION AND COMMUNICATION TECHNOLOGY
The amount of information we have is increasing all the time. We sometimes need to record it, process it, store it and share it with others often at great distances from us. Computers, either alone or in combination with some other technology like internet, enable us to do all these things quickly and efficiently. The term information and communication technology (ICT) includes the technologies which together support people’s ability to manage and communicate information electronically. Many studies of the impact of technology on teaching and learning conclude that technology has an important role to play in education at all levels that is from grade one to grade twelve and even beyond (in higher education).

1.3 ICT IN EDUCATION
The introduction of Information and Communication Technology in education is seen as a means of transforming teaching and learning. It is thus met with enthusiasm by both teachers and learners as it breaks away from the traditional textbook centred approach where the teacher is at the centre of every activity instead of learners. The Department of Education (DoE) stipulates that participation in the information society means that, “Every
South African learner in the general and further education and training bands (grade one to twelve) will be ICT capable (that is, use ICT confidently and creatively to help develop the skills and knowledge they need to achieve personal goals and to be full participants in the global community) by 2013” (DoE, 2003:17). In practice, the adoption and integration of computers is a challenging and complex process for schools, particularly where there is limited previous experience in the use of ICT to support teaching and learning. “The ability of teachers to set tasks that require learners to use information skills is appropriate and necessary at this time when South African teachers are being encouraged to adopt new teaching strategies that are outcomes based and learner centred” (Roos, 2005: page 21). Using computers in learning also introduces the learners to technology embedded practices of the post schooling technology-based information economy.

1.4 FACTORS CAUSING UNEQUAL ACCESSIBILITY AND AVAILABILITY OF ICT IN SCHOOLS

According to the Department of Education’s (2006) Draft Paper the unequal access to ICT in schools is due to the fact that the majority of South African schools are poor. These days there is a range of uses of ICT in South African schools. The use of ICT varies according to the economic and social conditions and where that school is located. For example, in South Africa there are former Model C schools which are seen as being affluent and the majority of them have computers and have access to internet whilst the majority of township and rural schools have no computers and therefore no access to internet. The use of ICT differs per school depending on whether the school can afford it in terms of acquiring computers and payment for internet services, as well as the qualifications of educators. In certain schools where computers are available, they are gathering dust in the computer laboratories or are stored somewhere. This is due to unavailability of personnel who can assist the learners to use these computers. Most schools especially those found in the former homelands lack basic physical infrastructure, classroom furniture, running water and sanitation. The Department of Education (2006) also concedes that the lack of adequately and appropriately qualified educators in the field of ICT is a contributing factor.

Mphidi (2004) also highlighted the factors listed below as contributing to unequal accessibility and availability of ICT in schools

- Physical access
- Lack of ICT support and skills
- Attitudinal factors
- Age
- Security
- Socio-economic backgrounds (Mphidi, 2004: page 46)

1.5 PROBLEM STATEMENT

The national education department is trying by all means to close the gap between the previously advantaged and disadvantaged schools. However huge disparities still exist between these schools in terms of resources and skilled workforce. The South African
government is trying to meet the increasing demand for education in the country and this cannot only be met by the traditional approach to education delivery (Evoh, 2007).

The present generation of learners is technologically advanced compared to previous generations, as the majority of them are exposed to cellphones. The integration of ICT into teaching and learning in the high schools in the Nelson Mandela Bay could change teaching and learning attitudes of teachers and learners and thus help them to prepare for future challenges. Examining the extent of usage of ICT in teaching and learning in the Nelson Mandela Bay area will help to identify needs assessment of learners and teachers. It will also help to examine the gap that still exists in the use of ICT between the two schools i.e. Douglas Mbopha High School and Victoria Park High School. This can also explain the disparities that still exist between the communities in the Nelson Mandela Bay Area.

1.6 OBJECTIVE
The aim of the study is to measure extent of the use of ICT at Douglas Mbopha High School, which is located at Motherwell a township in Port Elizabeth compared to Victoria Park High School, a former Model C school which is located in the affluent area of Walmer in Port Elizabeth.

1.7 THE BENEFITS OF ICT IN THE COUNTRY
Education is largely recognised as a route to information and knowledge literacy, and ultimately a significant step towards improving living standards and escaping poverty. Schools differ in terms of the availability of the most basic needs like electricity, water, proper learning facilities, computers and the internet. This has adverse effects in the quality of learning and teaching.

The increased use of the internet has gradually led to the reduction on the use of textbooks as the primary guide for instruction. This present a significant shift in South Africa, where many schools and teachers continue to rely heavily on often outdated textbooks as their primary learning and teaching material. Outcomes Based Education (OBE) requires a more learner-centred approach to teaching and learning and therefore the use of a range of learning material becomes increasingly important.

1.8 CONCLUSION
Introducing ICT in schools is a process which will change the present classroom environment, as it will empower both teachers and learners with new skills (Jones, 2002). It can provide teachers and schools with ‘professional’ equipment and enabling them to use it for professional learning which can raise their knowledge and status and that of their community. The Department of Education cannot go it alone in the introduction of ICT in schools. It therefore needs to build partnership with private sector, public sector as well as international partners.
1.9 CHAPTER OUTLINE

Chapter 1
This chapter is the introductory chapter and it explains:

- The study background
- ICT in education.
- Factors causing unequal accessibility and availability of ICT in schools.
- Problem statement
- Objective of the study
- The benefit of ICT in the country
- Conclusion

Chapter 2
This chapter covers some of the previously written and published literature in the topic of ICT in education and the following subtopics are covered:

- ICT in learning and teaching
- Specific educational uses of ICT
- Equity of access to ICT in education
- Major challenges in integrating ICT in education

Chapter 3
This chapter outlines the type of research methodology used in the study, for example:

- Methodology
- Population used in the study, for example learners, educators, principal and SGB members
- Data collection
- Instruments used in the research study
- Results analysis

Chapter 4
In this chapter findings from the respective schools are being tabled that is Douglas Mbopha High School and Victoria Park High School.
CHAPTER 2 - LITERATURE REVIEW

2.1 INTRODUCTION

We are living in the 21st Century and technology is playing a major role in our daily lives. It is therefore impossible to shy away from infusing ICT into teaching and learning in all spheres of education. It must be noted that integration of ICT into teaching and learning provides a lifelong skill to both educators and learners. It is therefore imperative for all stakeholders to face up to the challenges that will change the face of traditional teaching and learning where the teacher is playing a central role and the learner is a passive listener. This chapter examines the contributions made by different scholars on the use of ICT in teaching and learning, specific educational uses of ICT, factors which contribute to unequal access to ICT by various secondary schools, and key challenges in integrating ICT in education.

2.2 THEORETICAL FRAMEWORK

Many studies are keen to prove that ICT works and are thus concerned about showing cognitive gains due to the use of ICT. They believe that the use of ICT has a comparative advantage over traditional classrooms. In most township schools innovative education ideas are often hampered by the lack of ICT tools that might allow them to create new learning and teaching methods in a reliable and systematic fashion. The lack of tools constrains the activities carried out in these schools and educators are forced to compromise so much that the original intent is lost.

“Given the cognitive opportunities of ICT, it serves as a tool to mediate activities with respect to the guiding principles” (Cher Ping Lim, 2003: pg. 3), and “quotes various studies where ICT is used to achieve the desired activities in Mathematics and Science education. In these classrooms, graphic computer representations provide manipulable ‘virtual realities’ with action properties analogous to their real world counterparts (Pea, 1993: pg. 47)”.

The study of ICT in education cannot be fractured from the learning environment in which it is situated. “ICT may trigger changes in the activities, curriculum and interpersonal relationships in the learning environment, and is reciprocally affected by the very changes it causes” (Salomon, 1993: pg. 179).

2.3 ICT IN LEARNING AND TEACHING

Information and communication technology (ICT) includes radio and television as well as newer technology such as computers and the internet. There is a widely held view among the urban, the rural and the international community that effective use of ICT can contribute to an improved quality of education (Tinio, 2006). Information technology facilitates the flow of knowledge in modern society. The failure to use information technology is becoming as negative as the refusal to attend school. It is a choice between being left out or benefiting from enormous benefits of information technology. “Access to information continues to grow exponentially; schools cannot remain mere venues for the transmission of a prescribed set of information from teacher to student over a fixed period of time. Rather, schools must promote “learning
to learn; that is the acquisition of knowledge and skills that make possible for continuous learning over the life time” (Tinio, 2006: pg. 3).

The use of computers and the internet is however still in its infancy in developing countries. This is due to limited infrastructure and the attendant high costs of access. In developing countries, ICT has a potential for increasing access to and improving the relevance and quality of education. However the gap between those who have access to and control of technology and those who do not have means is widening. The introduction and integration of ICT at different levels and in various types of education will be a most challenging undertaking.

“Technological literacy is required for learning with technologies to be possible” (Tinio, 2006: pg. 14) that is students need to learn about technologies before they can actually use them in order to learn. In an accounting class, for example, students may start off a project by doing research online, and then proceed to use a spreadsheet and database programs to help organize and analyze data that they have collected, and then finally using a word processing application to prepare their written report. Meeting the demands of infusing ICT into teaching and learning, one needs to keep teachers up to date on the use and application of ICT in learning and teaching.

The government sees the introduction of ICT in education as central to its strategy of improving the quality of learning and teaching across the education training environments. There is a strong belief that the current generation is comfortable with technology since they are growing up in a digital world. The benefit of e-learning is that it enables students to actively engaged with the learning content and explore knowledge on their own and at their convenient time. ICT also offers learners in remote areas where there are no libraries an opportunity to access information. In an effort to tackle some most challenging matric subjects maths and computer science teachers are turning to instant messaging social network MXit to reach and teach high school pupils (Herald, 11 August 2011). This once infamous social network is being used for educational purposes due to its accessibility to pupils, consequently bridging the gap between serious learning and social fun. The paper went further by stating that the Nelson Mandela Metropolitan University computing sciences department turned to MXit after it saw the interest of the pupils growing after it launched a glossary of terms to help pupils studying Computer Applications Technology (CAT) subject in high school.

2.4 SPECIFIC EDUCATIONAL USES OF ICT

For the purposes of this research project and treatise the use of ICT shall be limited to its use for educational purposes only.

According to a paper prepared by School Net SA for GIED, in 2002 there is a range of ICT uses in schools. SchoolNet lists specific educational uses of ICT as follows:

(a) Using the internet to gather information

It provides a platform through which a wide range of information can be gathered and used to improve learning and teaching. The World Wide Web (web) offers a huge variety of
information and one of the advantages of the web is that the information is updated on a regular bases.

(b) Research and projects

Educators can set research and project based activities for learners. Learners thus have access to a wealth of information for project based learning and can therefore acquire unique information processing skills through internet. However the internet also lends itself to large scale plagiarism where learners simply copy and paste large chunks of content from the internet.

(c) Educators develop activities using online resources

The internet offers the educators a variety of resources to improve and supplement their lesson planning and classroom activity. These resources can be in the form of lesson plans, worksheets, video and sound clips.

(d) Using educational software

Specialist educational software can be used to support learning and teaching, in particular for mastery of facts and basic skills. This is called computer aided instruction. One of the popular uses of computer aided instruction is to provide repetitive drill opportunities for mastery of certain facts and processes that have already been taught. There are however certain limitations to the use of software for example Software cannot replace the educator since it is more appropriate for reinforcement than actual concept development. Many of the software packages are developed internationally and may not be suitable to the local curriculum and context. Commercial software requires potentially expensive once off payment or recurring licenses.

(e) Computer literacy

It refers to the skills required to use generic ICT applications such as word processers and spreadsheets. These are taught as standalone skills. One of the disadvantages of teaching computer literacy isolated from any context is that learners soon forget skills learnt if they do not have regular access to the technology.

(f) Computer studies

It refers to the practice of creating a specialist subject focusing on the technology and the design of systems for example Computer Applications Technology (CAT) and Information Technology (IT) at high school level. These two subjects are taught from Grade 10 to Grade 12 in the new South Africa curriculum. These two subjects require a dedicated computer laboratory. This therefore causes these subjects to be offered to a relatively small sample of the school population. These two subjects are examinable and at Grade 12 each learner should have his or her own computer.

(g) Facilitating communication

ICT can be used to support a range of communication strategies amongst educators and learners across the globe and within the school. E-mail is a useful tool to promote and
develop an environment in which learners and educators can interact. Educators can exchange ideas about their work, share lessons and receive support from their colleagues. Learners can collaborate on projects and learn about other people, countries and cultures.

2.5 EQUITY OF ACCESS TO ICT IN EDUCATION

“Given the disparities in access to ICT between the rich and poor countries and between different groups within countries, there are serious concerns that the use of ICT in education will widen existing divisions drawn along economic, social, cultural, geographic and gender lines” (Tinio, 2006: pg. 21).

The introduction of ICT in education when done without careful deliberation can result in the further marginalization of those who are already disadvantaged. Despite the benefits that ICT offers to learning processes, the majority of schools in rural and township areas in South Africa either do not have access to computers and the internet, or lack adequate skills and relevant programs to exploit the advantages of ICT (Mlitwa, 2006). The findings indicate that access to, and usage of, ICT in rural schools is inadequate. Where computers exist, they are not put to adequate use due to lack of relevant programs, problematic learner/computer ratios, and most disturbingly, a lack of computer skills among educators. Of utmost importance, therefore is more than just the provision of computers but also the means by which these can be put to beneficial use in all schools. A vibrant computer literacy program for educators in South Africa (especially in rural areas), together with the provision of the necessary programs for teaching, as well as measures to protect the infrastructure is strongly recommended (Mlitwa, 2006).

Providing access to ICT is only one facet of efforts to address equity issues. However equal attention must be paid to ensure that the technology is actually being used by the target learners and in ways that truly serve their needs.

The Department of Education Draft paper (2006) attributes the unequal access to ICT in schools to the fact that the majority of South African schools are poor. Most of these schools lack basic things like classroom furniture, running water and sanitation. The department further emphasizes that another factor is the lack of adequately and appropriately qualified educators in the field of ICT, and that this poses the biggest single challenge to the South African education system.

2.6 MAJOR CHALLENGES IN INTEGRATING ICT IN EDUCATION

“Although valuable lessons may be learned from best practices around the world, there is no one formula for determining the optimal level of ICT integration in the educational system” (Tinio, 2006: pg. 36). “Attempts to enhance and reform education through ICT require clear and specific objectives, time-bound targets, mobilization of required resources and political commitment at all levels” (Tinio, 2006: pg. 37).

According to (Tinio, 2006) some of the essential elements of planning for ICT are:
• A rigorous analysis of the present state of the educational system. Drivers and barriers to ICT use need to be identified, including those that are related to curriculum, infrastructure, capacity building, language and financing.
• The specification of educational goals at different education and training levels as well as the different modalities of use of ICT that can be employed in pursuit of these goals.
• Identification of stakeholders and harmonizing of efforts across different groups.
• Piloting of the chosen ICT based model. Even the best designed models or those that have already been proven to work in other contexts need to be tested on a small scale.
• The specification of existing resources of financing and the development of strategies for generating financial resources to support ICT use over long term. (Tinio, 2006: pg. 47)

Tinio (2006) further states that there are challenges related to the integration of ICT in education namely:

(a) Infrastructure challenges in ICT enhanced education

• Availability of rooms or buildings to house the technology considering issues of electrical wiring, heating/cooling and ventilation, and safety and security.
• Availability of electricity and telephony: In developing countries large areas are still without electricity and the nearest telephones are miles away. However the advent of wireless technologies like VSAT helps to solve the problem of telephones.

(b) Challenges with respect to capacity building

Various competencies must be developed through the educational system for ICT integration to be successful.

• Teacher professional development should be addressed through pre-service teacher training.
• Leadership plays a key role in ICT integration in education. Many ICT projects have been undermined by lack of support from above. It is therefore important that the administrators themselves must be competent in the use of technology in order for ICT programmes to be effective and sustainable.
• Technical support specialists should be available for the continued viability of ICT use in a given school. This can be provided by in – school staff or external service providers.

2.7 CONCLUSION

Nowadays it is becoming increasingly difficult to run an institution without using computers. Education and training is a key to building indigenous capacity that helps to reduce dependence on developed world, to cut the under-utilization of existing equipment and to help to apply technology for solving local complex problems.
CHAPTER 3–RESEARCH METHODOLOGY

3.1 INTRODUCTION
The research methodology guides the researcher in collecting and analysing and interpreting observed fact (Bless and Hogson - Smith, 1995). This chapter explains the methodology, sampling procedures and data collection procedures used in this study.

3.2 METHODOLOGY
This is a qualitative study where focus group discussions and semi structured interviews were used in order to establish the extent to which ICT is used at the schools in the Nelson Mandela Bay area. Two schools were used in the study i.e. Douglas Mbopha Senior Secondary School, a disadvantaged school which is located in Motherwell, and Victoria Park High School, a former Model C school, located in the affluent area of Walmer.

The following stakeholders in both institutions took part in the study i.e. principal, Head of Department (HOD) of ICT, School Governing Body (SGB) member, educators and learners.

**Douglas Mbopha High School**
(a) Learners (on 03 August 2011)
Focus group discussions were conducted with the learners and the composition of each group was as follows;

<table>
<thead>
<tr>
<th>Grade</th>
<th>Males</th>
<th>Females</th>
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<tr>
<td>10</td>
<td>9</td>
<td>8</td>
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<td>11</td>
<td>8</td>
<td>8</td>
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<tr>
<td>12</td>
<td>8</td>
<td>8</td>
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</table>

All learners were randomly selected with the assistance of educators. This ensured that all members of a group had an equal and independent chance of being selected. Numbers from one to forty were written in a piece of paper and were placed face down on the table. All the boys in the class had to take one piece of paper and the following instruction was given to them. All boys who had a piece of paper with odd numbers from eleven to twenty seven were used in the study. In the case of girls the same procedure was used but the difference was in the numbers used, for example those who had even numbers from two to sixteen were used in the study. Mr Mdlongwa a fellow Masters student, assisted as a note taker during the focus group discussion with the learners. A tape recorder was also used.

(b) Principal, HoD ICT and SGB member (on 05 August 2011)
A one-on-one interview was used with the above named stakeholders. A tape recorder was used during the interviews. Before the study was carried a one on one interview with the principal took place in order to explain everything pertaining to it.
Focus group discussions were conducted with four educators who offer the following subjects; accounting, mathematical literacy, life sciences and computer applications technology.

Victoria Park High School
(a) Learners (15 August 2011)
Focus group discussions were conducted with the learners and the composition of each group was as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>8</td>
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<td>11</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>12</td>
<td>8</td>
<td>4</td>
</tr>
</tbody>
</table>

All learners were randomly selected with the assistance of educators. This ensured that all members of a group had an equal and independent chance of being selected. Numbers from one to forty were written in a piece of paper and were placed faced down on the table. All boys in the class had to take one piece of paper and the following instruction was given to them. All boys who had a piece of paper with odd numbers from eleven to twenty seven were used in the study. In the case of girls the same procedure was used but the difference was in the numbers used, for example those who had even numbers from two to sixteen were used in the study. Mr Mdlongwa a fellow student assisted as a note taker during the focus group discussion with the learners. A tape recorder was also used.

(b) Principal, HOD ICT and SGB member (22-23 August 2011)
One-on-one interviews were used with the above named stakeholders. A tape recorder was used during the interviews. Before the study was carried out a one on one interview with the principal took place in order to explain everything pertaining to it.

(c) Educators (22-23 August 2011)
One-on-one interviews were conducted with educators as it was difficult to get them as a group. A tape recorder was used during the interviews.

3.3 INSTRUMENTS and ANALYSIS
The focus group guide used for the learners is attached as Annexure A, the questionnaire used for the members of the SGBs in Annexure B and that used for teachers in Annexure C. Responses from the participants were placed under the categories listed below for the purposes of analysis:

(a) Knowledge and accessibility of ICT
(b) Usage of ICT
3.4 CONCLUSION

This chapter focused on the instruments that were used to establish the extent of the use of ICT at schools in the Nelson Mandela Bay area. Learners from grades 10 – 12 were used as a target group in the study. The data obtained from the two schools visited will be analysed in the next chapter.
CHAPTER 4- FINDINGS / RESULTS

4.1 INTRODUCTION
Chapter Three dealt with the research methodology used in the study. This chapter focuses on the analysis of the data collected from a study carried out at Douglas Mbopha Senior Secondary which is located at Motherwell, and Victoria Park High School which is located in the affluent area of Walmer.

4.2 FINDINGS
The findings are discussed below.

4.2.1 Number of computers and accessibility
1. Douglas Mbopha Senior Secondary School
There are only 36 computers and one data projector for the entire school, which has a learner population of 1,246 and 44 educators. They are housed in the computer laboratory. The learners and educators share the same computers. Only students who take Computer Applications Technology (CAT) as a subject have access to computers and internet. This subject is offered from Grade 10 to Grade 12. Learners have access to internet only when they do Practical Assessment Tasks (PAT). Grade eight and nine learners have no access to computers. Other learners access internet for their projects by visiting internet cafes, libraries and by using their cellphones. Social networks like facebook and twitter are blocked at the school. Forty students out of 49 students (81.6%) who took part in the study have no access to computers at home.

2. Victoria Park High School
There are 176 computers housed in four computer laboratories, the school has a learner population of 1,008 and 44 educators. Teachers have seven computers housed in the teacher study room. Teachers and all learners have access to the internet. All learners have access to computers and internet during break time whilst in the case of educators internet is accessible throughout the day. Social networks are blocked. Learners also access internet through their cellphones. Only three students out 41 students (7.3%) who took part in the study, have no access to computers at home.

4.2.2 Knowledge and usage of ICT by teachers, learners and support (administration) staff
1. Douglas Mbopha Senior Secondary School
The majority of teachers are computer illiterate. The administration secretary uses computers for administration purposes, for example to generate schedules for the entire school, compile class lists and generate reports at the end of each term. Learners who are in grade eight, nine and those in Grade 10 to Grade 12 who do not take CAT as a subject, have no access to computers at school.
2. Victoria Park High School
The majority of teachers use ICT resources and are comfortable with the use of computers and data projectors. However, the older members of the staff are still computer challenged. Teachers use computers to file their documents for example lesson plans, exam papers, mark sheets and can send e-mails. The administration staff like the school secretary, principal’s secretary and bursar use computers for general administration activities. All learners have access to computers.

4.2.3. ICT related subjects offered by the school
1. Douglas Mbopha Senior Secondary School
Grades 10 to Grade 12 learners have an opportunity of taking CAT as a subject. This is guided by their subject combination. There is no computer literacy for grade eight and nine learners. For those learners who take CAT as a subject from grades 10 to 12, there are nine periods which are dedicated for its teaching over a 10 day cycle. There are no learners who take Information Technology (IT) as a subject. The numbers of learners who do CAT are as follows:
Grade 10 = 20
Grade 11 = 26
Grade 12 = 05
**TOTAL = 51**

2. Victoria Park High School
Grades 10 to Grade 12 learners have a choice of either taking CAT or IT as a subject. This depends on the learner’s choice of subjects. There are very few learners who do IT compared to those who do CAT. The numbers of learners who do these subjects are listed below:

<table>
<thead>
<tr>
<th>GRADE</th>
<th>CAT</th>
<th>IT</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>85</td>
<td>20</td>
</tr>
<tr>
<td>11</td>
<td>95</td>
<td>11</td>
</tr>
<tr>
<td>12</td>
<td>110</td>
<td>14</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>290</strong></td>
<td><strong>45</strong></td>
</tr>
</tbody>
</table>

All grades eight and nine learners do computer literacy which is a non-examinable subject.

4.2.4. ICT challenges concerning learners
1. Douglas Mbopha Senior Secondary School
There is a shortage of computers at this school for example there are only 36 computers for the entire school. Learners have no access to computers in order to do their projects. Computers are only available to those who do CAT as a subject. Their data/projects are often lost as there is no security measure to stop others from accessing their work.
time-to-time computers break and it takes a long time to fix them. Since the majority of them have no computers at home, it is impossible for them to complete some of the practical tasks at home. They cannot even prepare for practical examinations at home.

2. **Victoria Park High School**
The learners from this school view their computers as being out-dated; they now need computers with flat screens. They believe that the computers have old software and are sometimes too slow. They feel that learners, who do CAT as a subject, are being looked down upon, as CAT is seen as an easy subject. They lament the fact that CAT is not recognised as one of the dedicated subjects in order to qualify for National Senior Certificate (NSC) with admission to bachelors degree.

4.2.5. ICT challenges concerning teachers
1. **Douglas Mbopha Senior Secondary School**
The teachers indicated that there are not enough computers at this school. They feel that there is a lack of relevant software for all the subjects. It is too costly to maintain computers which pick up viruses from learners’ memory sticks affecting the whole network system.

2. **Victoria Park High School**
Teachers at this school feel that not all learners have access to internet at home. The ever changing technology is posing a big challenge to educators as they cannot keep up with new developments. Licensing fees for the computers is too expensive. The software at home is different to the one they have at school. Maintenance costs are a problem.

4.2.6. Views of the school governing body representative
1. **Douglas Mbopha Senior Secondary School**
The school governing body representative feels that they need to fundraise and also look for sponsors in order to develop a second computer lab for the large number of learners in their institution. The SGB helps in the maintenance and repair of computers by paying a monthly fee of R950 to an external service provider called Matrix. The secretary of the school governing body feels that the introduction of ICT has helped to improve the skills of the learners because now they can use programmes like Word, Excel and PowerPoint. They can also access the internet.

2. **Victoria Park High School**
The secretary of the school governing body views ICT as a primary mode that is essential for administration functions and communication. The secretary of the school governing body also sees CAT as helping learners in general to obtain various skills in computer usage and functions which is a basic life skill in today’s society, whilst IT is for learners who are interested in pursuing a career in Information Technology, or wanting to learn more regarding programming aspect of computers. The secretary feels that learners have benefitted as they are now proficient in computer usage: “My child in particular has found tremendous joy and stimulation in acquiring knowledge and skills pertaining to programming”.

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4.2.8. Principals and HOD view points on ICT at the school

1. Douglas Mbopha Senior Secondary School
The shortage of computers is viewed by both the principal and HOD as a major concern. The
skills of the few (4.1%) learners who are exposed to computers have improved. They feel
that the Department of Education needs to assist the previously disadvantaged schools in
terms of acquiring ICT resources.

2. Victoria Park High School
The principal and HOD are of the view that the use of ICT has improved their skills and
knowledge and they are more competent with programmes like Word, Power Point and
Excel. The HOD believes that computers have improved the skills of educators in his
department as they can generate their own class lists and can also compile mark lists. The
principal thinks that the use of computers has definitely improved the administrative
functioning of the school. The principal and the HOD are happy with the level of the school
with regards to usage, accessibility, effectiveness and the impact of ICT at the school for
both learners and teachers. They believe that the maintenance of the computer labs is a
costly exercise for example R130 per learner per annum that is, (R130 x 1008 learners =
R131 040). This comes from school fees which is R16 500 per learner per annum. The ever
changing technology is view as a major challenge by both of them.

4.3 CONCLUSION
Large disparities still exist between former Model C schools and the school from previously
disadvantaged schools in terms of ICT use and its accessibility. A similar study conducted at
the Sakhisizwe Senior Secondary School at Zwide location in Port Elizabeth, found that it
has only 29 computers for the entire school, there is no access to the internet and learners
have the opportunity to only do computer literary as there is no qualified teacher to teach
either CAT or IT. The school has 25 educators and 650 learners (Nomfundo, 2011). The same
situation applies at St James Senior Secondary School located in Schauderville a coloured
area: the school has only 28 computers (six learners share one computer) and the teachers
share one computer (Mooi, 2011). The situation is totally different at Pearson High school, a
former model C school, situated in the affluent area of Summerstrand where there are 140
computers. The school has 820 learners and 45 educators (Mdlongwa, 2011). The
government needs to intervene very soon if it wants to eliminated the digital divide that still
exist between these schools.
CHAPTER 5 - CONCLUSION

5.1 INTRODUCTION

This chapter concludes the study and make recommendations towards future research. The purpose of this study was to investigate the extent of the use of ICT at schools in the Nelson Mandela Bay area.

The use of ICT in education has been a priority in South Africa but the progress has been uneven between the former Model C schools and the previously disadvantaged schools. ICT is considered to be part of a solution to address the changing needs of societies.

5.2 CONCLUSION

The survey conducted in schools visited, i.e. Douglas Mbopha Senior Secondary School, a previously disadvantaged school located in Motherwell township, and Victoria Park High School, a former Model C school located in the affluent area of Walmer, clearly show that disparities still exist in terms of access and use of ICT in the schools found in the Nelson Mandela Bay area. The following conclusions can be drawn from the findings:

- Former Model C schools like Victoria Park High and Pearson High\(^1\) have embedded ICT into the school curriculum and demonstrate high levels of effective and appropriate ICT use to support and transform teaching and learning.
- Access to ICT in the previously disadvantaged schools like Douglas Mbopha Senior Secondary and St James High is quite limited hence they can only offer Computer Applications Technology (CAT). At Sakhisizwe Senior Secondary\(^2\) ICT is used almost exclusively to provide instruction in computer literacy.
- Schools in less privileged areas are less equipped in terms of computers and learners have no access to internet. This makes the goals of integrating ICT into teaching and learning by the Department of Education unattainable.
- The Department of Education needs to do more to assist educators in acquiring computer related skills so as to ensure effective use of ICT in teaching and learning.
- ICT in previously disadvantaged schools is mainly used for administration purposes and fewer learners are exposed to ICT instruments like computers.
- The unavailability of skilled personnel in a township school like Sakhisizwe Senior Secondary\(^3\) results in learners being taught computer literacy only in all grades.

These findings mean that the Department of Education will have to do more if it is to realise its vision of “Every South African learner in the general and further education and training bands will be ICT capable by 2013” (DoE, 2003:17).

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\(^1\) This school was covered by Edward Mdlongwa, a Masters student. His treatise is titled: ICT and Enhanced learning at Pearson High School, in the Nelson Mandela Bay Metropolitan.

\(^2\) This school was covered by Mihlali Mahleza, a Masters student. Her treatise is titled: Information Technology and Education in Urban Areas.

\(^3\) Mihlali Mahleza. 2011.
5.3 FUTURE RESEARCH

Future research could include an investigation on “How the use of ICT can be enhanced in schools throughout the Eastern Cape”. Another study could be how the Department of Education can fast-track the supply of ICT resources in the previously disadvantaged schools, as well as how to ensure that the schools which are currently in possession of computers can integrate them effectively in the teaching and learning situation.
6. REFERENCES


Cher Ping, Lim. (2003). Adopting a Sociocultural Perspective Towards the Research of Information and Communicatio Technologies (ICT) in Education.


Kalu, I. and Ekwueme, C.O. (2003). Assessment of teachers’ level of literacy and attitude towards information and communication technology application in science, technology and mathematics education; Department of Curriculum and Teaching, University of Calabar; Nigeria.


Annexure A (Learners)
Focus Group Guide-Topic: ICT usage, access and impact in Secondary Schools in the Nelson Mandela Bay Metropolitan (NMBM) (Learners)

<table>
<thead>
<tr>
<th>Topic</th>
<th>Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>5</td>
</tr>
<tr>
<td>Knowledge and Accessibility of ICT</td>
<td>15</td>
</tr>
<tr>
<td>Usage of ICT</td>
<td>10</td>
</tr>
<tr>
<td>Effectiveness of ICT</td>
<td>10</td>
</tr>
<tr>
<td>Impact of ICT</td>
<td>15</td>
</tr>
<tr>
<td>Closing of discussion/Summary</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total Time</strong></td>
<td><strong>60</strong></td>
</tr>
</tbody>
</table>

The broad questions covered in the focus group discussions

The purpose of this study/research is to determine the following with regards ICT at the school:

- The accessibility of ICT at your school
- The usage of ICT at your school
- The effectiveness of ICT at your school and
- The impact of ICT at your school

Below is a general guide for leading our focus groups. We may modify this guide as needed as each focus group will inform the subsequent groups. Before the group begins, conduct the informed consent process, including discussion about confidentiality of research.

Introduction (5min)

- Welcome participants and introduce yourself.
- Explain the general purpose of the discussion and why the participants were chosen.
- Discuss the purpose and process of focus groups
- Explain the presence and purpose of recording equipment and introduce observers.
- Outline general ground rules and discussion guidelines such as the importance of everyone speaking up, talking one at a time, and being prepared for the moderator to interrupt to assure that all the topics can be covered.
- Address the issue of confidentiality.
- Inform the group that information discussed is going to be analyzed as a whole and that participant names will not be used in any analysis of the discussion.
- Read a protocol summary to the participants.
Knowledge and Accessibility of ICT (15 min)

Questions to be asked under knowledge and accessibility of ICT at school include the following:

- What do you know about ICT/IT?
- What is ICT used for?
- Do you have access to the instruments of ICT like computers and the internet at your school?
- Do you have ICT as a subject?
- Do all learners take ICT as a subject?

Usage of ICT (10 min)

Questions to be asked under usage of ICT at school include the following:

- What do you use computers for at your school?
- What ICT instruments have you used before?
- Do you use ICT in your personal lives besides at school?

Effectiveness of ICT (10 min)

Questions to be asked under effectiveness of ICT at school include the following:

- Do you think ICT improves your skills and knowledge?
- How effective do you think is ICT in education?

Impact of ICT (15 min)

Questions to be asked under impact of ICT at school include the following:

- What impact has ICT had in both your education and personal life?
- What challenges are you facing with regards ICT at your school?
- What do you suggest that can be done in order to overcome the challenges you stated previously?

Summary/Conclusion (5 min)

- Closing remarks
- Thank the participants
Annexure B (SGB)

<table>
<thead>
<tr>
<th>Topic</th>
<th>Minutes</th>
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</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>10</td>
</tr>
<tr>
<td>Knowledge and Accessibility of ICT</td>
<td>15</td>
</tr>
<tr>
<td>Involvement in ICT</td>
<td>15</td>
</tr>
<tr>
<td>Impact of ICT</td>
<td>15</td>
</tr>
<tr>
<td>Closing of discussion/Summary</td>
<td>5</td>
</tr>
<tr>
<td>Total Time</td>
<td>60</td>
</tr>
</tbody>
</table>

The broad questions to be covered in focus group discussions

The purpose of this study/research is to determine the following with regards ICT at your school:

- The knowledge and accessibility of ICT at your school
- Your involvement in ICT at your school and
- The impact of ICT at your school

Below is a general guide for leading our focus groups. We may modify this guide as needed as each focus group will inform the subsequent groups. Before the group begins, conduct the informed consent process, including discussion about confidentiality of research.

**Introduction (10min)**

- Welcome participants and introduce yourself.
- Explain the general purpose of the discussion and why the participants were chosen.
- Discuss the purpose and process of focus groups
- Explain the presence and purpose of recording equipment and introduce observers.
- Outline general ground rules and discussion guidelines such as the importance of everyone speaking up, talking one at a time, and being prepared for the moderator to interrupt to assure that all the topics can be covered.
- Address the issue of confidentiality.
- Inform the group that information discussed is going to be analyzed as a whole and that participant names will not be used in any analysis of the discussion.
- Read a protocol summary to the participants.

**Knowledge and Accessibility of ICT (15 min)**

Questions to be asked under knowledge and accessibility of ICT at school include the following:

- What do you know about ICT/IT?
- What is ICT used for?
• In your view do you think learners at your school have access to the instruments of ICT like computers and the internet?
• In your view do you think ICT should be taught as a subject at school?
• In your view does ICT assist learners at your school?

**Involvement in ICT (15 min)**

Questions to be asked under involvement of ICT at school include the following:

• What do you do to make sure that ICT resources are available in your school?
• What is your role in ensuring maintenance of ICT in your school?
• What is your involvement in making sure that the computers/hardware are kept safely at school?

**Impact of ICT (15 min)**

Questions to be asked under impact of ICT at school include the following:

• What impact has ICT had in both the education and personal lives of your children?
• As SGB members what are some of the challenges that you are facing with regards ICT at your school?
• What do you suggest that can be done in order to overcome the challenges you stated previously?

**Summary/Conclusion (5 min)**

• Closing remarks
• Thank the participants
Annexure C (Teachers)
Focus Group Guide for Teachers-Topic: ICT usage, access and impact in Secondary Schools in the Nelson Mandela Bay Metropolitan (NMBM)

<table>
<thead>
<tr>
<th>Topic</th>
<th>Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>5</td>
</tr>
<tr>
<td>Knowledge and Accessibility of ICT</td>
<td>15</td>
</tr>
<tr>
<td>Usage of ICT</td>
<td>10</td>
</tr>
<tr>
<td>Effectiveness of ICT</td>
<td>10</td>
</tr>
<tr>
<td>Impact of ICT</td>
<td>15</td>
</tr>
<tr>
<td>Closing of discussion/Summary</td>
<td>5</td>
</tr>
<tr>
<td>Total Time</td>
<td>60</td>
</tr>
</tbody>
</table>

The broad questions to be covered in focus group discussions

The purpose of this study/research is to determine the following with regards ICT at your school:

- The accessibility of ICT at your school
- The usage of ICT at your school
- The effectiveness of ICT at your school and
- The impact of ICT at your school

Below is a general guide for leading our focus groups. We may modify this guide as needed as each focus group will inform the subsequent groups. Before the group begins, conduct the informed consent process, including discussion about confidentiality of research.

Introduction (5min)

- Welcome participants and introduce yourself.
- Explain the general purpose of the discussion and why the participants were chosen.
- Discuss the purpose and process of focus groups
- Explain the presence and purpose of recording equipment and introduce observers.
- Outline general ground rules and discussion guidelines such as the importance of everyone speaking up, talking one at a time, and being prepared for the moderator to interrupt to assure that all the topics can be covered.
- Address the issue of confidentiality.
- Inform the group that information discussed is going to be analyzed as a whole and that participant names will not be used in any analysis of the discussion.
- Read a protocol summary to the participants.

Knowledge and Accessibility of ICT (15 min)

Questions to be asked under knowledge and accessibility of ICT at school include the following:
• What do you know about ICT/IT?
• What is ICT used for?
• Do you have access to the instruments of ICT like computers and the internet at your school?
• Do you have ICT as a subject at your school?
• Do all learners take ICT as a subject?

**Usage of ICT (10 min)**

Questions to be asked under usage of ICT at school include the following:

• How accessible are computers to teachers during their working hours?
• What do you mainly use computers at your school for administrative purposes or teaching purposes?
• How frequently do you make use of computers at your school?

**Effectiveness of ICT (10 min)**

Questions to be asked under effectiveness of ICT at school include the following:

• Do you think the introduction of ICT has improved your own skills and knowledge?
• Do you think the introduction of ICT has improved the skills and knowledge of the learners at your school?
• Has ICT improved the administrative functioning in your school?

**Impact of ICT (15 min)**

Questions to be asked under impact of ICT at school include the following:

• What attitude do learners have towards ICT as opposed to traditional methods of teaching?
• What challenges are you facing as an educator with regard ICT at your school?
• What challenges are you facing with regard ICT at your school?
• What do you suggest that can be done in order to overcome the challenges you stated previously?

**Summary/Conclusion (5 min)**

• Closing remarks
• Thank the participants
Annexure D (Principal)
Semi-structured questionnaire- interview guide for Principal

Introduction
My name is Richard Sonkwale. I am a student at Nelson Mandela Metropolitan University (NMMU) in Summerstrand, South Campus and I am currently completing my Masters Degree in Development Studies. One of the requirements of the fulfilment of my degree is that I conduct a research project. The topic for my research project is: “The Study of the use of Information and Communications Technology (ICT) in schools in the Nelson Mandela Bay Metropolitan Area”. Findings from the project will help in the future development of ICT in schools across Port Elizabeth. Your answers will be kept anonymous but we may quote some of the things you tell us in some of our reports, without attributing them to you. Please do let me know if you want more details about this project or have any other doubts which I might not have addressed.

<table>
<thead>
<tr>
<th>Broad Topic areas for Discussion</th>
<th>Questions For Principals</th>
<th>Possible Probes (follow up questions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Knowledge and accessibility</td>
<td>What do you know/think about ICT? Is ICT taught as a subject at your school? Do all learners at your school take ICT as a subject? Does your school have access to the instruments of ICT like computers/internet?</td>
<td>How important is ICT in your school’s development? How many learners take ICT as a subject?</td>
</tr>
<tr>
<td>2. Usage of ICT</td>
<td>How accessible are computers to teachers during their working hours? What is the main use of computers at your school for administrative purposes or teaching purposes? How frequently do you make use of computers at your school?</td>
<td>Which other members of staff use computers besides teachers at your school?</td>
</tr>
<tr>
<td>3. Effectiveness of ICT</td>
<td>Do you think the introduction of ICT has improved your own skills and knowledge?</td>
<td>Do you think that the introduction of ICT has improved the skills and knowledge of teachers at your school?</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Do you think the introduction of ICT has improved the skills and</td>
<td>Do you think that the introduction of ICT has improved the administrative functioning in your school?</td>
<td></td>
</tr>
<tr>
<td>knowledge of the learners at your school?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you think that the introduction of ICT has improved the administrative functioning in your school?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you think that the introduction of ICT has contributed to more</td>
<td>Can you give practical examples of how this has happened?</td>
<td></td>
</tr>
<tr>
<td>effective teaching and learning at your school?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What some of the challenges with regard ICT at your school?</td>
<td>How do you hope some of these challenges can be overcome?</td>
<td></td>
</tr>
</tbody>
</table>

5. Summary & Conclusion- Thank interviewee and Closing Remarks!